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**A SURVEY OF WILDERNESS TRAIL USERS
IN MOUNT RAINIER NATIONAL PARK**

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Technical Report NPS/CCSOUW/NRTR-2000-01
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PREFACE

This document reports the results from a survey of visitors to Wilderness Trails in Mount Rainier National Park (MORA) in the summer of 1995. The questionnaire and on-site contact sheet used in this study are included in Appendix A and B. The questions used in the survey are included in the text of this report. However, readers may benefit by reviewing the questionnaires in order to familiarize themselves with the survey items and the format in which they were originally presented.

It is anticipated that this report will be used primarily as a reference document and, therefore, depending on each reader's objective, this report may be used in very different ways. However, any reader not familiar with statistical analysis of survey data is encouraged to refer to Appendix C, "How To Use This Report."

I. Survey Highlights

This study was designed to address information needs identified in 1995 by the Mount Rainer (MORA) General Management Plan (GMP) team. The survey was designed to gather information about Wilderness Trail Users, their experiences in MORA, how tightly they are tied to their plans to visit specific wilderness trails, and to identify possible alternate destinations.

Analyses focus on visitors to the following wilderness trails: Mount Fremont, Comet Falls, Glacier Basin, and Summerland. Respondents were limited to visitors over the age of 15 and to parties entering between July 13, 1995 and September 7, 1995. The study design included a contact point questionnaire and a mail survey to allow a comparison between expectations held before the trip with actual trip experience.

In this section we present selected findings from the survey results. The highlighted findings have important implications that are likely to be of particular interest to MORA managers. However, they do not represent all findings that are likely to be of interest to any single reader. Therefore, readers wishing to make full use of this report should carefully read the sections that are relevant to their particular interests.

Who are wilderness trail visitors?

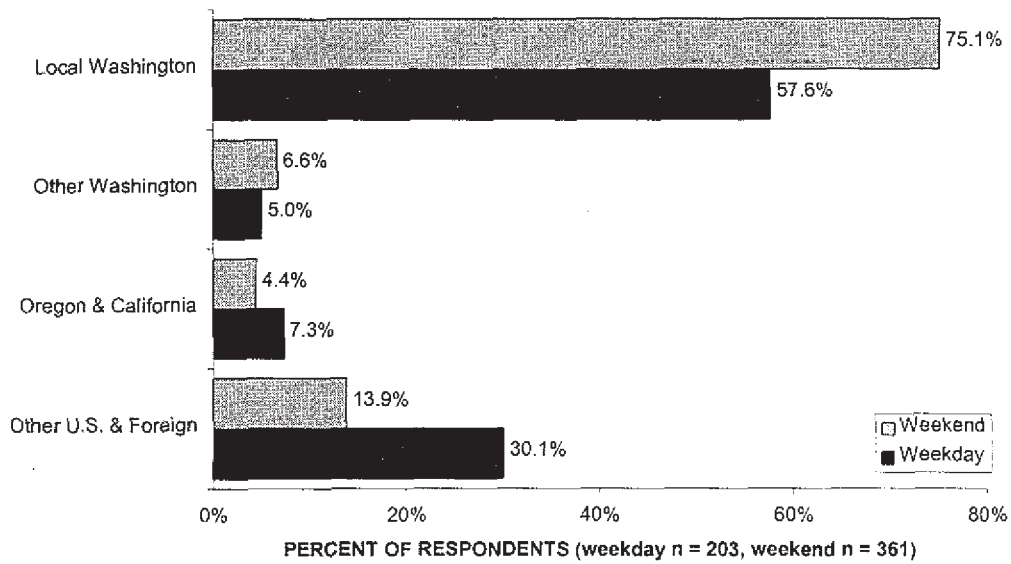
Wilderness trail visitors are younger (Mean¹ = 40 years) than general park visitors (Mean = 43 years, MORA 1990 Visitor Survey). The proportion of male to female visitors (52% vs. 48%) and the lack of racial diversity (94.3% Caucasian) were similar to findings for general visitors to MORA. As can be seen in Figure 1.1, a larger proportion

¹ The mean value for a group is equivalent to the average for that group.

I. Survey Highlights

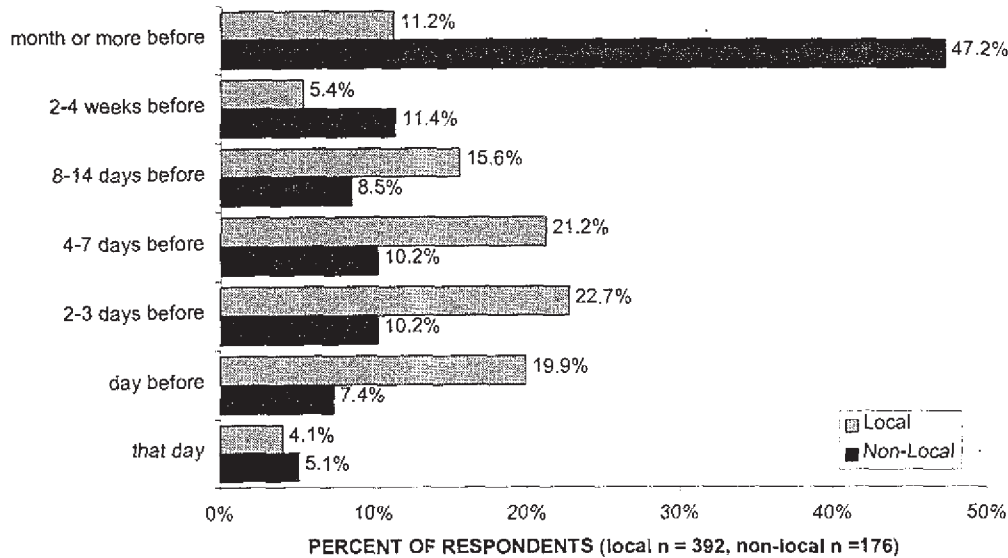
of wilderness trail visitors contacted on the weekend compared to weekdays lived locally. Additionally, only 4.1% of local visitors decided to visit MORA on that day (see Figure 1.2) suggesting that most trips to MORA are not spontaneous.

FIGURE 1.1: Contact Sheet Q-3
PLACE OF RESIDENCE BY DAY OF WEEK CONTACTED



I. Survey Highlights

FIGURE 1.2: Q-1
TIME WHEN DECISION TO VISIT MORA WAS MADE



Less than half of wilderness trail respondents reported being aware of Congressional mandates regarding Wilderness at MORA.

Questions 25 and 26 in the mail survey explored wilderness trail users knowledge of official designations. Less than half (40%) of wilderness trail respondents reported being aware "that about 97% of MORA is officially designated by Congress as Wilderness" (see Figure 1.3). Also, less than half (40.5%) of wilderness trail respondents reported knowing that "natural areas officially designated as Wilderness are required by law to provide 'opportunities for solitude' and to be managed 'so that the imprint of man is substantially unnoticeable'" (see Figure 1.4). Although these "don't know" rates are high (over 50%), these estimates are most likely conservative as people have a bias against admitting ignorance.

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Knowledge of "natural areas officially designated as Wilderness are required by law to provide 'opportunities for solitude' and to be managed 'so that the imprint of man is substantially unnoticeable'", however, varied significantly by contact point, $\chi^2(3) = 10.15$, $p = .017$. Comet Falls had a larger proportion of respondents who "did not know" (69.2%) than the other three contact points which did not differ significantly (Glacier Basin [50.0%], Summerland [60.2%], & Mount Fremont [56.0%]). Comet Falls is often recommended by park personnel to nonlocal or inexperienced visitors looking for a hike. These visitors tend to be unfamiliar with MORA including information regarding its official designations. Likewise, Summerland is another trail often recommended to nonlocal or inexperienced visitors looking for a hike, and respondents contacted at Summerland had a somewhat higher "don't know" rate than respondents contacted at Mount Fremont or Glacier Basin. This process of referring significant numbers of visitors to wilderness designated areas can be seen as a fundamental contradiction with the wilderness mandate.

I. Survey Highlights

FIGURE 1.3: Q-25
AWARENESS THAT ABOUT 97% OF MORA IS OFFICIALLY DESIGNATED BY CONGRESS AS WILDERNESS

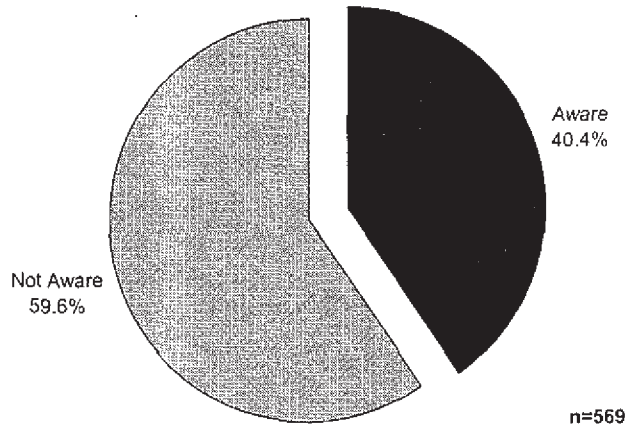
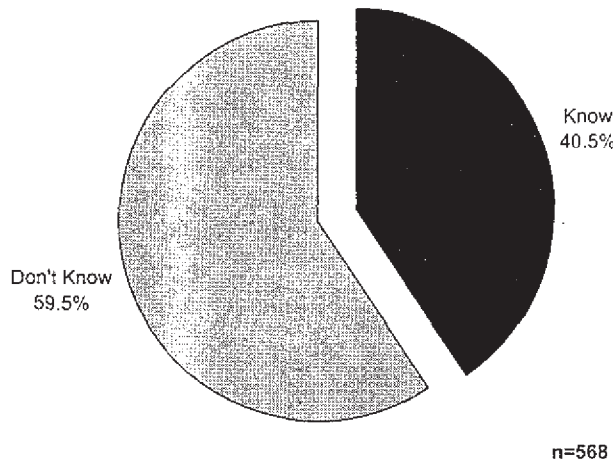


FIGURE 1.4: Q-26
KNOW THAT WILDERNESS DESIGNATION REQUIRES PROVIDING "OPPORTUNITIES FOR SOLITUDE" AND MANAGED "SO IMPRINT OF MAN IS SUBSTANTIALLY UNNOTICEABLE"



I. Survey Highlights

Less than 10% of wilderness trail visitors account for one-third of total trips to MORA.

A subset of wilderness trail respondents who may be of particular interest to MORA managers are those who most often visit MORA. Wilderness trail respondents who visited 20 or more times in the last three years made up 7.9% of the sample. However, they account for 34% of the total trips to MORA in the last three years that were reported by all respondents. If these respondents are excluded from the sample leaving only the respondents who had visited fewer than 20 times (92.1% of all respondents), the average number of trips to MORA in the last three years is 4.7 trips (compared to 6.6 trips for all respondents). Clearly, policies or information that affect this small group of MORA respondents will have a disproportionately large effect on conditions in the Park. Because of their potential to affect the Park, it would be wise to find out more about this group of respondents.

Wilderness trail visitors are different on different days and different trails.

Survey data aggregated across the whole sample are commonly used to represent all respondents. This approach can be misleading if there are distinct sub-groups in the sample. Visitors responses to each question were examined for differences due to contact point and day of week when the visitor was contacted. We looked at contact point because differences across contact points have the potential to be important in understanding wilderness trail users and setting policy. We also looked at day of week contacted because we knew we had oversampled weekend visitors. Thus, if we observed differences in responses due to day of week contacted, simple aggregation of the data across the sample would bias the results toward visitors contacted on weekend

I. Survey Highlights

days. These tests revealed that Wilderness Trail visitors' responses often differed by contact point and day of week contacted.

An example of a managerially important contact point difference was obtained when asking respondents about the number of visitors seen versus number they expected to see. More respondents saw the number of other visitors they expected at Mount Fremont (57.6%) and Comet Falls (58.5%) than at Glacier Basin (49.6%) or Summerland (48.1%). Glacier Basin had the largest number of respondents reporting seeing 'more' (22.6%) and 'a lot more' (6.1%) visitors than expected; Summerland had the greatest number of respondents who saw fewer people than expected (29.0% vs. 18.3%, 14.1% and 12.8%). More respondents contacted at Comet Falls had no expectations than respondents at the other three contact points (8.1% vs. 3.5%, 5.6%, and 2.5%). This higher proportion of respondents with no expectations at Comet Falls is consistent with the higher proportion of respondents with no specific destination. It may be that a small proportion of respondents contacted at Comet Falls are tourists with no plans and no knowledge on which to base any expectation concerning the number other visitors they would encounter.

Day of week contacted was found to be strongly related to respondents' place of residence (local vs. nonlocal)². Therefore, we analyzed whether observed day of week contacted effects were being driven by place of residence. Analyses revealed that in some cases observed day of week contacted effects were due to place of residence. In other cases, however, day of week effects were independent of place of residence effects. Observed effects are described in the report, and Chapter 8 provides a table summarizing which effects were observed for each question. Taken together these

² More respondents contacted on the weekend were local while more respondents contacted on weekdays were nonlocal

I. Survey Highlights

findings indicate that systematically aggregating data from all Wilderness Trail respondents may lead to erroneous conclusions and poor policy.

Most wilderness trail respondents expect a scenic hiking trip and get it.

During the initial contact, respondents were asked to select what kind of experience they expected to have during their present trip. Options included a wilderness hiking trip, a scenic hiking trip, or a social recreation trip³.

A wilderness hiking trip was described as "a trip through a scenic area with little evidence of man, many opportunities for solitude, and a chance for challenge in navigating and hiking over difficult terrain."

A scenic hiking trip was described as "a trip through a scenic area with some evidence of man, fewer opportunities for solitude, and trails that show good routes through difficult terrain."

A social recreation trip was described as "a trip in a scenic area with much evidence of man, beautiful views of rugged terrain, and seeing other people on the trails makes the trip more fun."

As seen in Figure 1.5, 75.9% of respondents expected a scenic hiking trip, 15.8% of respondents expected a wilderness trip, and 8.3% expected a social recreation trip. On the mail survey, the majority (81.7%) of respondents reported their actual trip was a scenic hiking trip⁴. Although the proportion of visitors experiencing each type of trip does not differ much from the proportion of visitors expecting each type of trip, it cannot be assumed that most visitors experienced the type of trip they expected. A comparison of actual and expected trip experience for each respondent revealed that 71.0% of

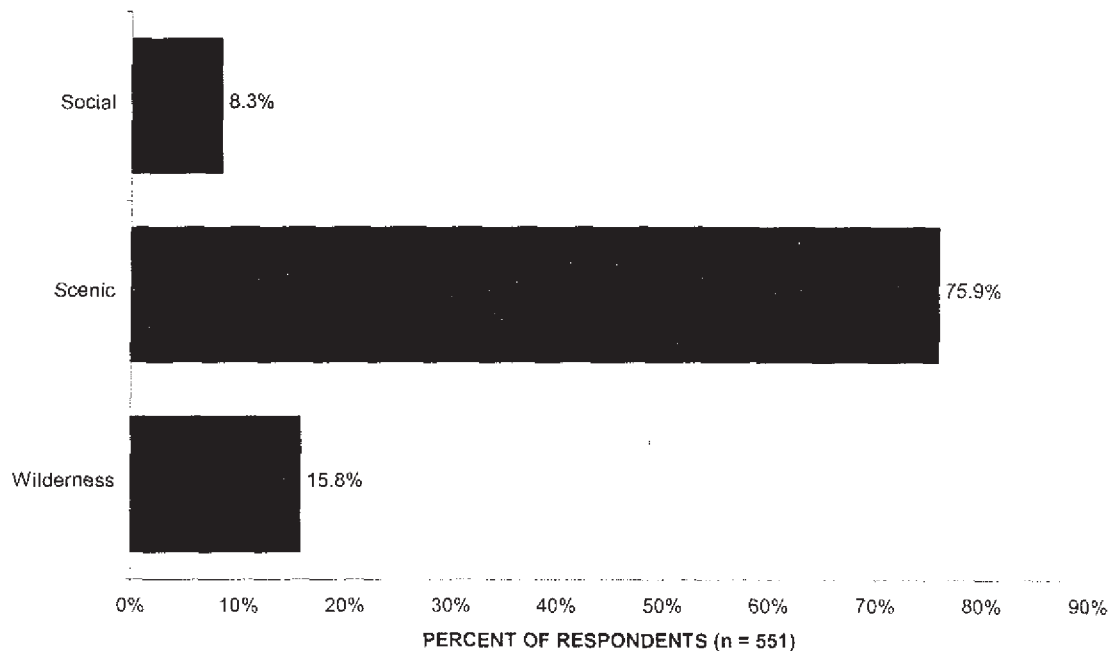
³ These descriptions were based on three similar descriptions used by Roggenbuck, Williams, Bange, and Dean (1991). The descriptions vary on multiple dimensions (e.g., evidence of man, solitude, navigational challenge), but each dimension is not necessarily mentioned in each scenario.

⁴ Differences across contact points are described in detail in Chapter 5.

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respondents had the type of trip they expected. As seen in Figure 1.6, a larger proportion of respondents' trip expectations were met for those expecting a social hiking trip (78.7%) than either a wilderness hiking trip (38.2%) or a social recreation trip (31.7%). The question raised by these findings is whether it is appropriate that most wilderness trail visitors are expecting and experiencing scenic hiking trips in areas designated as Wilderness.

FIGURE 1.5: Contact Sheet Q-3
TYPE OF TRIP EXPERIENCE EXPECTED

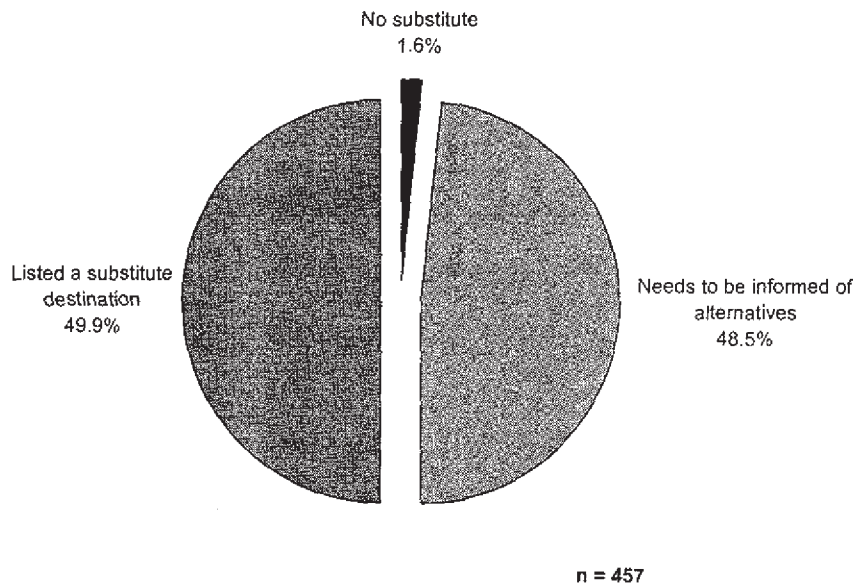


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Displacing visitors to acceptable substitute destinations is possible, but many visitors would need to be informed of alternatives.

Over three-quarters (81.9%) of respondents reported that they would accept a substitute destination. Just under half (48.5%) of these respondents indicated that they would need to be informed of alternatives in MORA (see Figure 1.7). About half (48.5%) of respondents who would accept a substitute listed at least one acceptable substitute destination outside MORA, and 37.3% of respondents would need to be informed of alternatives outside MORA (see Figure 1.8). A larger proportion of respondents indicated that no acceptable substitute destination was available outside MORA (14.2%) than had indicated no acceptable substitute destination was available in MORA (1.6%).

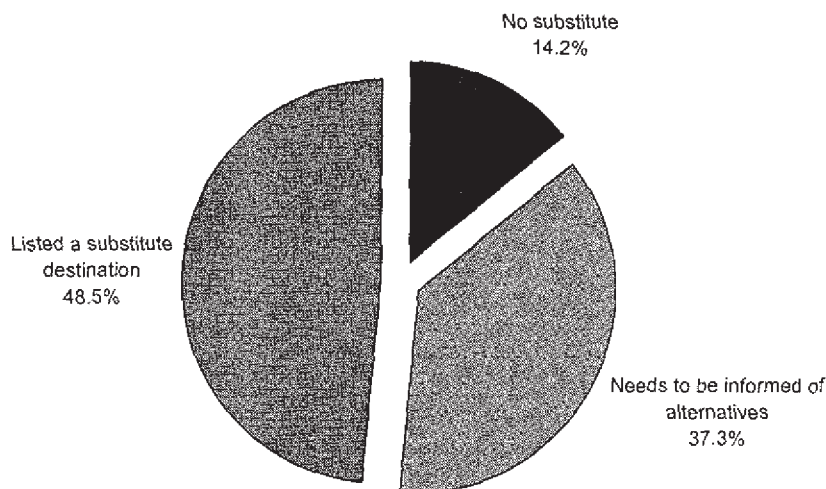
FIGURE 1.7: Q-15
DOES AN ACCEPTABLE SUBSTITUTE DESTINATION INSIDE MORA EXIST?



Includes only the 81.9% of respondents who would accept a substitute destination.

I. Survey Highlights

FIGURE 1.8: Q-15
DOES AN ACCEPTABLE SUBSTITUTE DESTINATION OUTSIDE MORA EXIST?



n = 457

Includes only the 81.9% of respondents who would accept a substitute destination.

Respondents who need information about substitute destinations are those with less hiking experience.

Logistic regression analyses indicated that respondents who needed information about substitute destinations in MORA were respondents: a) with fewer trips to MORA in the past three years, b) who had no specific destination, and c) whose groups had children less than 16 years of age. An analogous regression analysis was done for respondents needing information about substitute destinations outside MORA. Respondents who had fewer trips to MORA in the last 3 years, who had sought information prior to their present trip, and whose groups had children less than 16 years of age were more likely to need information.

I. Survey Highlights

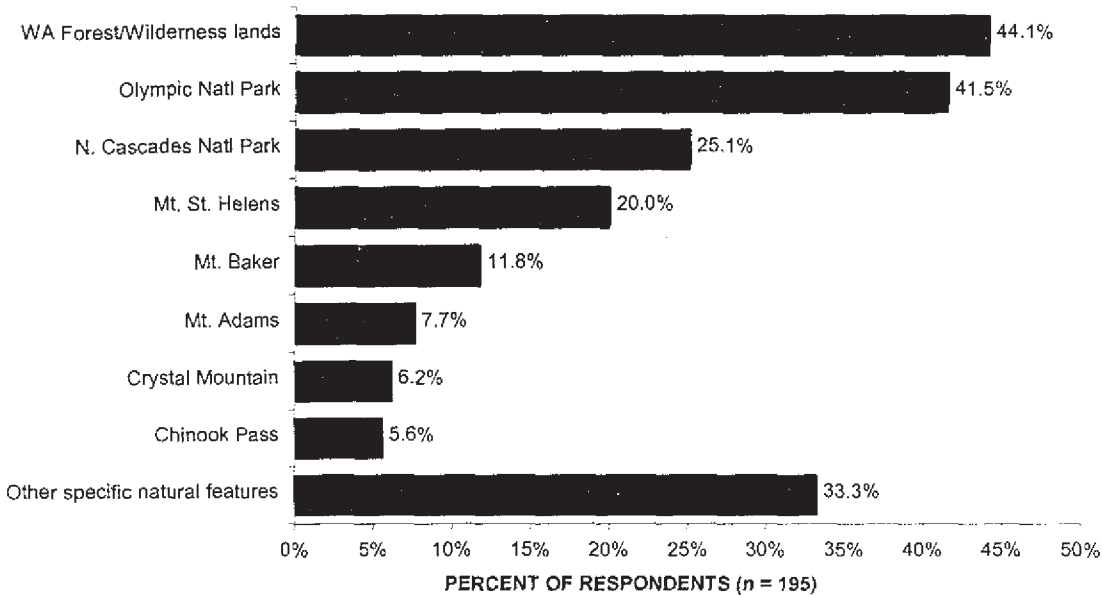
Given the similar findings of the two analyses and the substantial (74.2%) overlap in respondents who need information about acceptable substitutes in MORA and those who need information about acceptable substitutes outside MORA, a single interpretation for both analyses would be advantageous and not unreasonable. Thus, respondents who need more information about substitute destinations (inside or outside MORA) can be characterized as those with less hiking experience.

Displacing visitors to destinations outside MORA will affect other local National Parks.

As can be seen in Figure 1.9, Olympic National Park (41.5%) and North Cascades National Park (33.3%) were the second and third most commonly listed acceptable substitute destinations outside MORA. The large number of respondents indicating other National Parks are important for at least two reasons. First, respondents indicating they would visit Olympic National Park or North Cascades National Park may be people who specifically desire a National Park visit. If so, these respondents will not be easily displaced to a non-National Park destination. Knowing what percentage of these respondents specifically desire a National Park experience will be important when examining possible effects on Olympic National Park or North Cascades National Park visitation levels. Second, should MORA decide to impose limits on the number of visitors to wilderness trails, many of these respondents will visit Olympic National Park or North Cascades National Park (regardless of desire for a National Park experience) increasing their visitation levels. This finding suggests that coordination among these three National Parks will be necessary if each park is to meet its visitation level objectives.

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FIGURE 1.9: Q-15
SUBSTITUTE DESTINATIONS OUTSIDE OF MORA



Includes only the 48.5% of respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

Wilderness trail respondents' expectations but not their preferences have been adjusted for differences in visitor density on weekdays and weekends.

The number of visitors respondents saw versus the number of visitors they *expected* to see did not differ by day of week contacted. Compared to respondents contacted on weekdays, however, a greater proportion of respondents contacted on the weekend saw more visitors than they *preferred*. These findings in conjunction with the fact of *increased visitation on weekends compared to weekdays suggests that respondents have incorporated into their expectations, but not their preferences, differences in visitor density on weekdays and weekends.*

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Increased visitor density does not necessarily mean increased crowding when comparing across different contact points.

Per the 1995 Visitor Distribution survey, visitation estimates are higher on weekends than weekdays for all sites and weather conditions. This finding is consistent with increased crowding reported by visitors contacted on the weekend than by visitors contacted on the weekday⁵ (see Chapter 5). Estimated visitation is highest at Comet Falls, then Mount Fremont, and lowest at Glacier Basin⁶. This pattern, however, does not correspond to the pattern obtained for degree of crowding. Respondents contacted at Mount Fremont reported the greatest degree of crowding (Mean = 3.8) followed closely by respondents contacted at Glacier Basin (Mean = 3.6). Respondents contacted at Summerland (Mean = 3.3) and Comet Falls (Mean = 3.2) reported the smallest degree of crowding. Thus, more visitors does not necessarily mean more perceived crowding when the comparison is being made across different sites. Other factors that can affect crowding such as the size of the area the people are in (i.e., visitor density) or visitor's expectations about the number of other visitors may vary as well.

Different aspects of visitor density correspond to crowding depending on the type of trip experience expected.

As described in Chapter 5, factor analyses of responses to the visitor density questions were done for each type of expected trip experience to determine if these

⁵ As noted earlier day of week contacted is not equivalent to being a weekday or weekend visitor. However, visitors contacted on the weekend are more likely to be reporting about weekend days and visitors contacted on weekdays are more likely to be reporting about weekdays.

⁶ No visitation data are available for Summerland as it was not part of the 1995 Visitor Distribution Survey.

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groups have the same underlying dimensions. The following points emerged from these analyses.

- Effects due to crowding (i.e., effects due to the number of other visitors) were independent of other types of other-visitor effects (e.g., impacts of other parties' behavior) for all three types of expected trips.
- Crowding was reflected in overall trip satisfaction as a function of type of trip expected. Specifically, as type of trip expected involved a greater number of other visitors, the weaker the relationship between overall trip satisfaction and crowding.
- Direct effects of other visitors (e.g., other parties' behavior detracted) were related to indirect effects of other visitors (e.g., saw unacceptable damage) for respondents expecting either a scenic hiking trip or a wilderness hiking trip, but not for respondents expecting a social recreation trip.
- Non-crowding effects of other visitors were reflected in overall trip satisfaction ratings only for respondents expecting a social recreation trip.
- For people expecting a wilderness trip, crowding ratings (i.e., To what degree did the number of people that you encountered ... make you feel "crowded"?) may reflect both effects due to the number of other visitors and effects of other visitors' behavior.

I. Survey Highlights

In contrast, the same crowding ratings of respondents expecting a scenic hiking trip or a social recreation trip reflect only effects due to number of other visitors.

II. INTRODUCTION

The 1995 Mount Rainier National Park Wilderness Trail Visitor Survey (WTVS) was administered by the USGS, Biological Resources Division, Forest and Rangeland Ecosystem Science Center, Cascadia Field Station (formerly the Cooperative Park Studies Unit). The study was proposed and funded by the Planning Division of the National Park Service, Denver Service Center.

The survey objectives included the following: (1) to assess what types of visitors are found at a variety of wilderness trails; (2) to assess how visitors are using wilderness trails by asking about their hikes and about their trips to MORA in general; (3) to assess how visitors perceive existing park conditions along wilderness trails by asking about resource damage and crowding due to other visitors; (4) to assess how tightly visitors are tied to their plans to visit specific wilderness trails, and to identify possible alternate destinations.

The WTVS was intended to address these objectives for day-hikers visiting trails located in wilderness areas of MORA. Contact with visitors was attempted at six trails/trail access points: West Side Road, Eagle Peak, Comet Falls, Summerland, Glacier Basin, and Mt. Fremont. These sites were selected to represent trails in a variety of geographical areas that vary in the intensity of their use. It was anticipated that the data collected would be useful in the process of creating a new general management plan, particularly in the definition and placement of prescriptive wilderness zones.

II. Introduction

Survey Design and Questionnaire Development

Visitors were contacted at six different wilderness trails at MORA and again within a few weeks of their trip via mail questionnaire. The use of the contact point questionnaire was motivated partly by an interest in the possible differences between the expectations and the reality of visitors' trips to the area. In post-trip questionnaires it may be difficult for visitors to accurately recollect the expectations and preferences they held prior to their experience. Therefore, it was important to contact visitors at the entry point before experience could revise expectations. Visitors were contacted at the trailhead for four of the trails (Comet Falls, Eagle Peak, Summerland, and West Side Road) and at the point where the specific trail branched off for two of the trails (Glacier Basin and Mount Fremont)⁷. By comparing responses to the contact point and mail questionnaires, we can detect differences between the trips visitors expected and the trips they experienced, and hypothesize about the reasons for such differences.

The use of a mail questionnaire (rather than an on-site interview) for the final set of the questions was motivated primarily by the logistics of contacting people on their return. The length of time spent on the trail varies dramatically (including overnight or longer) and some trails have more than one exit. There was also a concern that an undue burden would be placed on visitors during their trip if they were asked to answer the necessary number of questions on-site.

The survey procedures as well as the questionnaires (see Appendices A and B) were produced by the Cascadia Field Station in cooperation with the DSC planning group and

⁷ For the latter two trails, the possibility exists that experiences between the trailhead and the contact point may have modified expectations.

II. Introduction

the MORA staff. Initial meetings were held in the fall of 1994 to establish general project objectives. Input from park staff was essential in ensuring that the questionnaires addressed management needs. The draft questionnaires were sent to the Office of Management and Budget for review and approval in February 1995.

Sampling and Visitor Contact Procedures

The population to which statistical generalization is intended in the WTVS is to all visitors over the age of 15 entering the trails at the designated contact points, and is limited to parties entering between July 13, 1995 to September 7, 1995.⁸ The study design called for initial visitor contacts to be made by a Field Station survey worker who was located a short distance (around 20 feet) up the trail. One person over the age of 15 from each party that approached was asked to complete a questionnaire. The questionnaire asked that all members of the party provide their names and addresses, and that they answer a question about their trip expectations. Compliance with the request to complete the contact survey was about 95% and virtually all of those respondents provided names and addresses. It is not possible to assess evidence of non-response bias due to the 5 percent of visitors who refused to complete the entrance survey. However, the possible effects of any such bias are small due to the relatively small number of such visitors. Parties who refused commonly reported that they were in a hurry or were on a tight schedule.

⁸ Because the Comet Falls contact point was added to the survey after data collection had begun, contacts were made at that trail after August 13, 1995.

II. Introduction

A total of 776 contact sheets were filled out, yielding 693 names and addresses (sampling every-other name listed). Of the 693 questionnaires mailed out, 9 were returned due to incorrect or out-of-date addresses and 2 were sent back but the respondent refused to fill them out. Thus, the final response rate was 84%, with 578 of 682 questionnaires completed and entered in the data file.

Survey contacts were made between approximately 10:00 A.M. and 6:00 P.M. on a sample of days during the collection period. The goal of the sampling procedure was to make at least 160 contacts at each contact point and the number of days spent at a given contact point ranged from 10 (Comet Falls) to 13 (Glacier Basin and Mt. Fremont). A disproportionate number of the days spent at all contact points were weekends. This sampling bias was deemed acceptable in order to increase the efficiency of survey workers' time spent in contacting visitors and to thus obtain acceptably large samples of visitors. Analyses and adjustments intended to minimize any effect of this bias on survey conclusions are included throughout this report.

Two contact points (Eagle Peak and West Side Road) had lower than anticipated visitor use making it impractical to continue data collection at these sites after August 18th. The actual number of people contacted at Eagle Peak was 18 (2.6%) and at West Side Road was 6 (0.9%). Because the insufficient sample sizes at each of these locations precluded including them in statistical tests that examined the effects of contact point and day of week contacted (weekend vs. weekday), these data were excluded from all analyses.

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Mail Questionnaire Administration

The survey sample was constructed by systematically selecting every second name, after a random start, on the list of names created by the on-site sheets. Questionnaires were mailed to participants accompanied by a cover letter from the Field Station. Respondents were instructed to complete the questionnaires and return them by mail in postage-paid envelopes. As a follow-up, all respondents were sent a thank-you/reminder letter about ten days after they received the questionnaire. Non-respondents received a second reminder letter and an additional copy of the questionnaire. A third letter was sent to those who did not respond to the second reminder. Out of a total of 698 questionnaires mailed to valid addresses, 576 were returned. The response rate for the WTVS was approximately 83 percent.

Statistical Considerations

Readers not familiar with statistical analyses of survey data are encouraged to refer to Appendix C, "How to Use This Report". Consistent with convention, statistical significance was set at the .05 level for analyses included in this report. Statistical tests with p-values equal to or less than .05 are interpreted as indicating effects that are reliable or real (not due to chance). Although statistical analyses highlight statistically significant effects, they are unable to reveal whether effects have important practical implications. It may be that effects that just miss reaching the .05 level have large practical implications while highly statistically significant effects have no practical implications. Thus, it is important to consider the practical implications of these data.

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Limitations

The WTVS has several general limitations that should be kept in mind in interpreting the data. (1) In all surveys it is assumed that respondents provide accurate and honest answers to the questions asked. (2) The data represent visitor attitudes and opinions at a particular point in time (i.e., the time of the survey) and changes can occur at any time. (3) Statistical inferences can only be made for the subset of Mount Rainier National Park visitors entering the specified wilderness trails. In addition, there are other limitations noted in the body of the report that are due to the manner in which individual questions were interpreted. Finally, there are other limitations that revolve around the issue of non-response (i.e., possible bias in the sample due to differences between the visitors who completed the questionnaires and those who didn't).

Non-response. Although 83 percent of the persons completing the contact sheet questionnaire also completed the mail questionnaire, it is mathematically possible that the remaining 17 percent (the non-respondents) might be sufficiently different from the respondents so as to affect the accuracy with which the sample data represent the population. A wide range of data were available from the contact point questionnaire, allowing statistical tests to be used to search for possible differences between respondents and non-respondents. Specifically, possible differences were assessed using Chi-square tests for independence that determined whether response rates were independent of a particular visitor characteristic (using a .05 significance level). Nine visitor characteristics were selected from the contact point questionnaire and used in assessing possible non-response bias. These characteristics included gender, age, distance between respondent's home and MORA, party size, whether there were any

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children in the party, whether there were children under the age of 16 in the party, expectations of trip experience, contact point, and survey worker.

For the visitor characteristics listed above, statistically significant differences in response rates were found for gender, age, and visitor origin. Female visitors were more likely than male visitors (86% versus 80%, respectively) to return the mail questionnaire, $\chi^2(1) = 5.1$, $p = .025$. Older visitors were more likely to return the mail questionnaire than younger visitors with a 30% non-response rate in the youngest age category (16-25) and only 11% non-response among visitors 55 or older, $\chi^2(4) = 16.1$, $p = .003$ (ages were coded into 10 year categories beginning with the youngest possible respondent's age of 16). Finally, local visitors were more likely to return the mail questionnaire than were visitors from other parts of Washington, the U.S., or foreign countries with a 15% non-response rate for local visitors and 23-24% non-response for all other visitors, $\chi^2(3) = 8.2$; $p = .042$; coded Local Washington, Other Washington, Oregon & California, and Other U.S. & Foreign.

The results of the non-response analysis clearly show that there are detectable differences between the visitors who responded to the mail questionnaire and those that did not. Response differences by age are very common in this type of survey; similar differentials have been observed in previous surveys at MORA and they are generally the largest differences observed. In the contact sheet questionnaire, 35.2 was the average age. For the mail survey respondents, 40.0 was the average age. Thus, the largest non-response bias that we observed (by far) changed our estimate of Wilderness Trail visitors' average age by 4.7 years, or 13.4%.

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Because this change was larger than normally observed in similar surveys, effects due to age were examined on key variables. Specifically, age differences were examined for the variables related to visitor density and displacement. Only one significant effect of age was found. Respondents needing information to locate an acceptable substitute destination in MORA were younger ($M=39.3$ years) than respondents not needing information ($M=41.5$ years), $t(432)=1.99$, $p=.047$. Given the large number of tests performed, this observed effect might be due to chance alone. In fact, the effect is not significant when the Bonferroni correction⁹ for multiple comparisons is used. Should the effect be reliable (real), then the proportion of respondents needing information may be underestimated as the final sample contains fewer younger respondents. It should be noted that this effect of age on needing information is small (Cohen's $d = .19$)¹⁰ and thus, the error in estimating the proportion of respondents needing information should be small as well. Although we can not rule out the possibility that undetected examples of non-response bias may have important effects on the results of the WTVS mail survey, effects smaller than those associated with age are not large enough to alter the representativeness of the sample in important ways.

In an effort to establish that the intended respondent completed the mail questionnaire, the visitor characteristics of age and gender were compared between the contact sheet and the mail questionnaire. The age and gender indicated on the mail

⁹ The Bonferroni correction for multiple comparisons corrects for the increased likelihood of obtaining a significant result when many related comparisons are made. The per comparison significance level is obtained by taking .05 divided by the number of comparisons.

¹⁰ Cohen's d is a measure of the size of an observed effect in standard deviation units. By convention, effect sizes for differences between groups of .2 are small, .5 are medium, and .8 are large.

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questionnaire agreed with those indicated on the contact sheet for 52.6% of respondents. An additional 28.9% of respondents indicated the same gender and an age of 1 year greater on the mail questionnaire suggesting these individuals had birthdays since completing the contact sheet questionnaire. That the remaining 18.5% of respondents to the mail questionnaire were most likely not the intended respondents raises issues about the appropriateness of including their data in the analyses.

A discriminant function analysis¹¹ failed to distinguish between the intended and unintended respondents suggesting that unintended respondents are not a distinct group. To determine whether including these unintended respondents may bias the results, effects of respondent type (intended vs. unintended) were examined for 24 key variables including those related to visitor density and displacement. Only one significant effect was observed. Unintended respondents were more likely to indicate that other parties' behavior detracted from their experience (23.9%) than were intended respondents (14.7%), $\chi^2(1)=6.85$, $p=.009$. This effect, however, fails to reach significance when the Bonferroni correction for multiple comparisons is used. Should the effect be reliable, then the proportion of respondents indicating that other parties' behavior detracted from their experience would be overestimated.

Accuracy of the Sample

Subject to the limitations stated previously, the authors generally believe that the data are representative of Mount Rainier National Park visitors to the specified wilderness trails

¹¹ Discriminant function analysis is a statistical procedure that assesses whether respondents' answers to various questions reliably distinguish between members of the different groups.

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who visited during the time of the survey. This confidence is based on the large sample sizes, the small differences in response rates observed for different types of visitors, and the fact that deviations from the sampling plan were relatively minor. Therefore, the data should be highly relevant to many park management decisions and planning efforts.

Assuming a random sample and questions of yes/no type in which the true occurrences of these values in the population are 50%/50%, the data from the smallest sample in this survey (the 576 respondents completing the contact sheet and mail questionnaires) can be generalized to the population of visitors to the four wilderness trails with a 95 percent assurance that the obtained or observed percentages to any item will vary by no more than $\pm 4.0\%$. For the largest sample (the 698 respondents to the contact sheet questionnaire) the same confidence interval is $\pm 3.7\%$.

Conventions Followed In This Report

As mentioned previously, a contact sheet and mail questionnaire were used to collect the data presented in this report. These questionnaires are included in this report (see Appendices A and B), and it is recommended that they be reviewed before reading the body of this report. The specific questionnaire and question used to collect the data reported in each chart are noted in the chart titles. The number of respondents (n) whose data are represented in each chart is also reported, generally at the bottom of the chart. For questions asked on the contact sheet questionnaire, the maximum number of respondents is 698. For questions asked on the mail questionnaire, the maximum number of respondents is 576. When a chart reports data for a subset of

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respondents (*c.f.*, Figure 4.9: *Glacier Basin Respondents' Front Country Destinations*), a note describes the sub-sample included in the chart.

To determine whether our sampling method resulted in biases in our data, responses to each question were examined to see if they differed by day of week contacted. We also looked for differences due to contact point or interactions between day of week contacted and contact point. It was found that a greater proportion of respondents contacted on weekdays were not local and a greater proportion of respondents contacted on weekend days lived locally. Thus, for every observed effect of day of week contacted, additional analyses were done to determine if the effect was due to respondents' residence (local vs. nonlocal), day of week contacted, or some combination. When significant effects for these variables were observed, they are reported. An absence of a discussion of these variables should be interpreted as indicating that no significant effects were found.

Visitors contacted on the weekend compared to those contacted on weekdays were overrepresented in this sample. If visitors contacted on the weekend differed from those contacted on the weekday, then data combined across day of week contacted would be biased in the direction of visitors contacted on the weekend. When significant effects of day of week contacted were observed, the data were weighted to correct for the overrepresentation of visitors contacted on the weekend. Variables whose data were weighted are indicated in the text and on the graphs.

Caution should be exercised in interpreting the variable described as *day of week visitors contacted* as equivalent to weekend versus weekday visitors. Visitors contacted on both weekdays and weekends, on average, spent more than 24 hours in the park

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(43.8 hours and 30.0 hours, respectively). Thus, it may be that visitors contacted on a weekday (e.g., Thursday) spent 3 days at MORA (e.g., Thurs., Fri., Sat.) and so some of the activities they reported engaging in during their stay at MORA may have been done on weekend days. Similarly, visitors contacted on the weekend may be reporting on experiences that actually happened on weekdays.

Missing data for up to 10% of respondents to a particular question are generally not considered to be a major threat to the interpretation of that question. Throughout this report, few questions had more than 10% missing data. Exceptions are noted in the text.

It is neither possible nor desirable that this report describes all possible analyses of the data collected by the survey, or even all analyses that are potentially of interest to MORA managers. However, some analyses that may be of interest are briefly noted throughout this report and described as potential future analyses. Park managers and planners are encouraged to think creatively about potential analyses of the data.

III. VISITOR PROFILE

Wilderness Trail respondents were contacted at the six trailheads discussed previously but data are reported only for respondents contacted at Glacier Basin, Mount Fremont, Summerland, and Comet Falls (see p. 20 for clarification). Contacted hikers were asked a variety of demographic questions that are used here to describe, or provide a profile of, wilderness trail users.

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Age and Gender

The average age of WTVS respondents was approximately 40 years. Ages ranged from 16 to 76 years. Figure 3.1 shows that over three-fourths (78%) of respondents were between 20 and 49 years of age, and only 6% of respondents were over the age of 60. The relatively small number of older adults sampled reflects the decreased activity associated with increased age. Based on the analysis of non-response discussed earlier, age of respondents is one of the characteristics most likely to be affected by non-response bias. However, because these data were collected in the contact point questionnaire, which very few respondents refused to complete, it is unlikely that such bias had an important effect. The sample of wilderness trail users consisted of 52% males and 48% females (see Figure 3.2).

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FIGURE 3.1: Contact Sheet Q-3
AGE OF WILDERNESS TRAIL RESPONDENTS

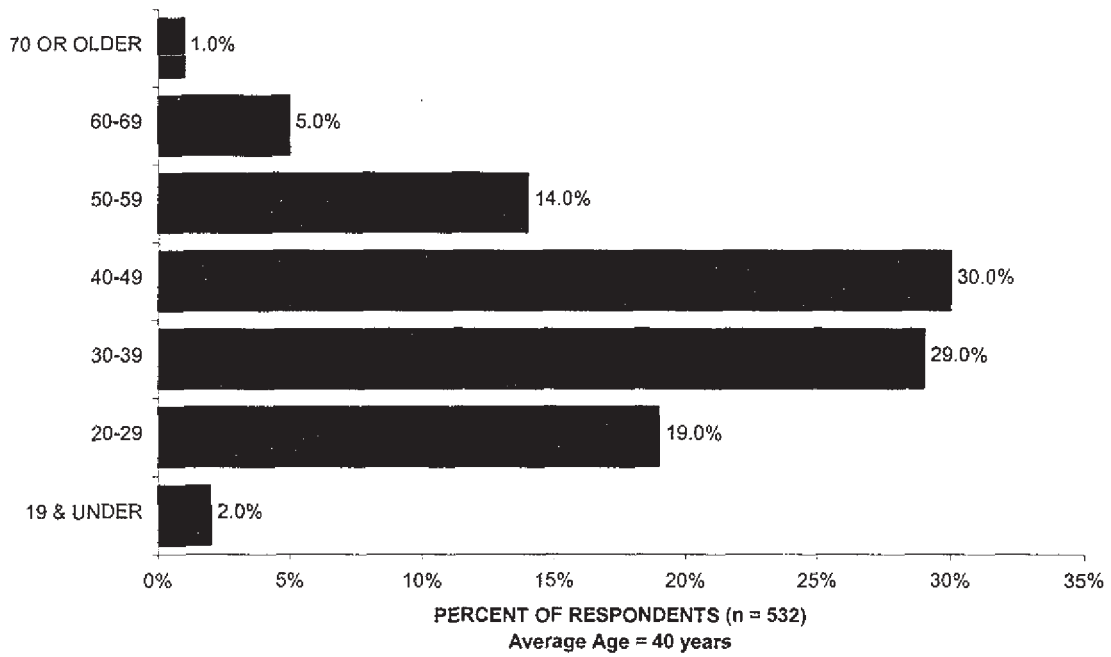
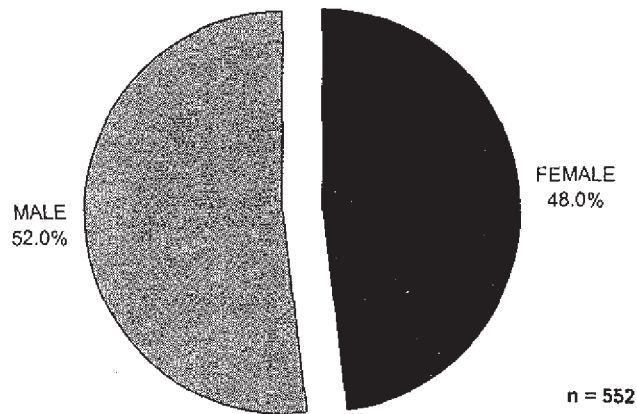


FIGURE 3.2: Contact Sheet Q-3
GENDER OF WILDERNESS TRAIL RESPONDENTS

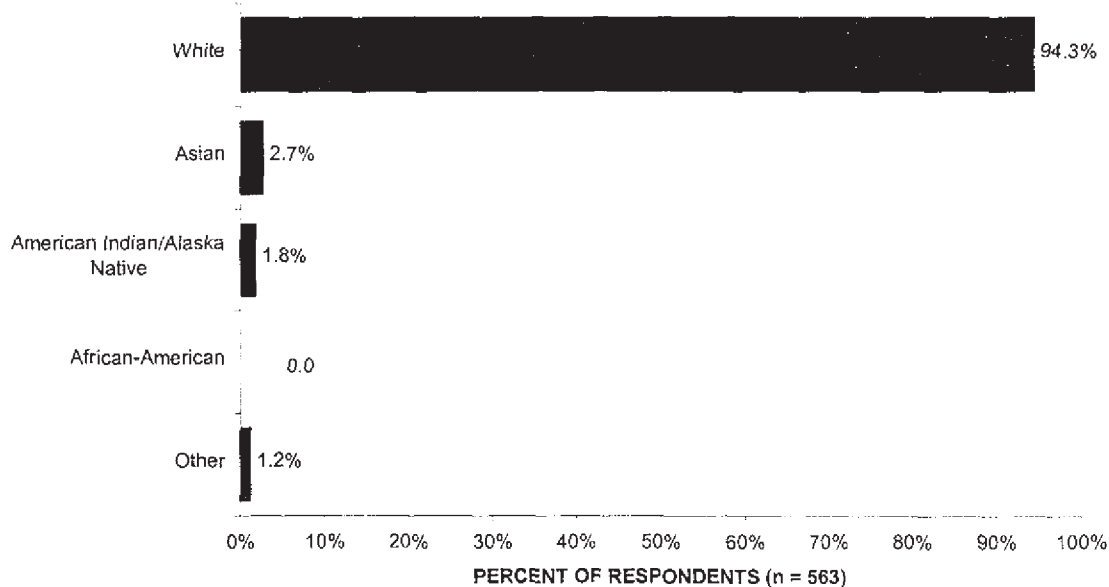


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Race

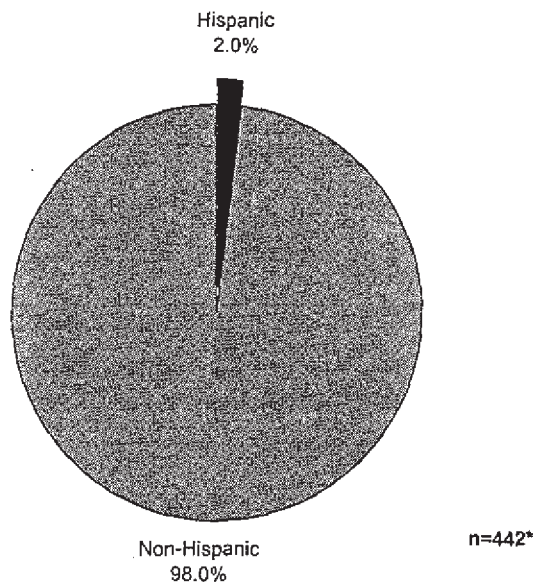
Nearly all of the Wilderness Trail respondents (94.3%) were white (see Figure 3.3) and only 2% of respondents indicated that they were Hispanic (see Figure 3.4). The higher rate of missing data (23.3%) on the second part of question 22, which asked if the respondent was Hispanic, most likely arose because respondents presumed that if they answered the first question about race they need not answer the second. Only 1 of the 9 respondents who were Hispanic were from foreign countries and none of the respondents who were Asian were from foreign countries. No respondents were African-American. This observed lack of racial diversity was only slightly more notable than what has been found in other surveys of MORA visitors.

FIGURE 3.3: Q-22
RACE OF WILDERNESS TRAIL RESPONDENTS



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FIGURE 3.4: Q-22
PROPORTION OF HISPANIC WILDERNESS TRAIL RESPONDENTS



*23.3% (134/567) of the respondents failed to complete this question.

Education

The average wilderness trail respondent had completed just over 17 years of formal education (equivalent to 1 year of graduate/professional school). Figure 3.5 shows that nearly one half of the sample had graduate or professional training and less than six percent had no post-secondary training.

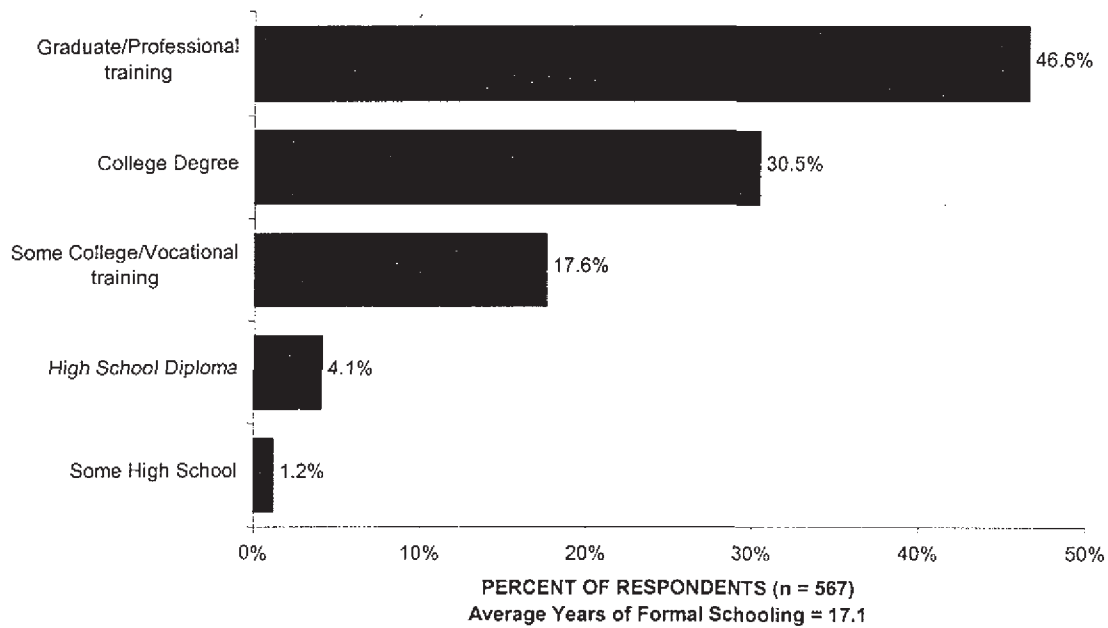
Formal education levels of wilderness trail respondents differed significantly by contact point, $F(3, 530) = 4.84, p=.002$. Respondents contacted at Mount Fremont and Summerland had more education ($M^{12} = 17.6$ years and 17.2 years, respectively) than those contacted at Glacier Basin ($M = 16.7$ years) or Comet

¹² M is used to represent mean or average.

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Falls (M = 16.3 years). Post hoc Tukey¹³ analyses revealed that education levels of respondents contacted at Comet Falls were significantly lower than those of respondents contacted at Summerland ($p = .038$) or Mount Fremont ($p = .002$).

FIGURE 3.5: Q-20
HIGHEST LEVEL OF FORMAL EDUCATION COMPLETED



Occupation

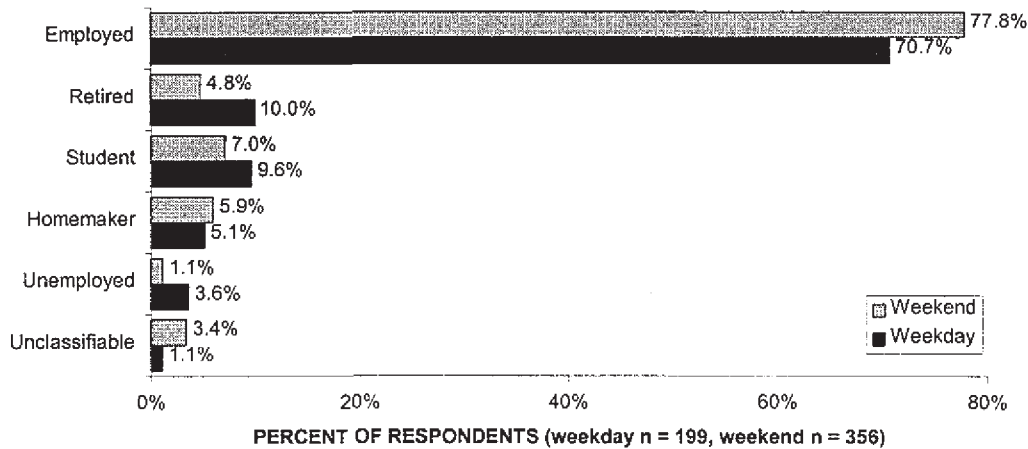
As can be seen in Figure 3.6 the majority of wilderness trail respondents are employed and only a very small proportion are unemployed. Employment status differed by day of week contacted, $\chi^2(5) = 13.87$, $p = .016$. For respondents contacted on weekdays, there was a smaller proportion of employed respondents

¹³ A Tukey test is a statistical procedure that controls for the increased likelihood of obtaining a significant result due to chance when making multiple comparisons. The Tukey test is used when testing all possible pairwise comparisons for a set of group means, and results in a stricter significance level than .05 for each pairwise comparison. Significant differences obtained using the Tukey test can be interpreted as real differences that are unlikely to be due to chance.

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than for respondents contacted on weekends (77.8% versus 70.7%) and a larger proportion of respondents who were either retired (10.0% vs. 4.8%), students (9.6% vs. 7.0%), or unemployed (3.6% vs. 1.1%). The observed differences are consistent with the fact that most employed people work during the week and have leisure time primarily on the weekends.

FIGURE 3.6: Q-21
EMPLOYMENT STATUS OF WILDERNESS TRAIL RESPONDENTS



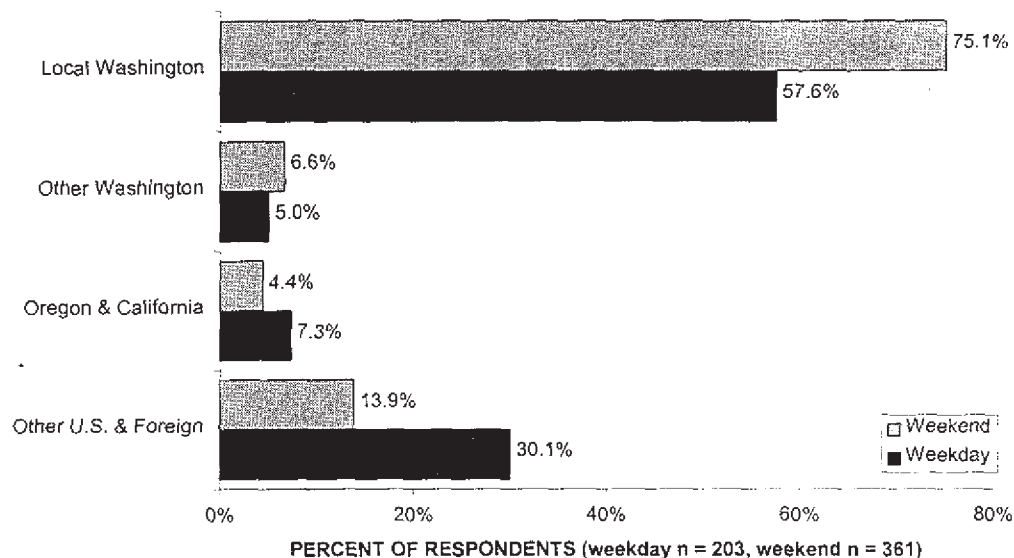
Place of Residence

Place of residence was divided into four categories: 1) Local Washington, which included King, Snohomish, Pierce, & Lewis counties, 2) Other Washington, 3) Oregon & California, and 4) Other U.S. and Foreign Countries. Place of residence varied significantly by day of week contacted, $\chi^2(3) = 25.77, p < .001$ (see Figure 3.7). Figure 3.7 shows that a larger proportion of wilderness trail

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respondents contacted on weekends were from Local Washington than were respondents contacted on weekdays (75.1% vs. 57.6%). Also, Other U.S. and Foreign respondents were a smaller proportion of respondents contacted on the weekend than on the weekday (13.9% vs. 30.0%).

FIGURE 3.7: Contact Sheet Q-3
PLACE OF RESIDENCE BY DAY OF WEEK CONTACTED



The sample was weighted to correct for the overrepresentation of respondents contacted on the weekend, and these weighted data were used when examining contact point differences. Place of residence varied significantly by contact point, $\chi^2(9) = 52.62, p < .001$. Review of Figures 3.8-3.11 shows that local respondents were a larger proportion of respondents at Summerland (82.7%) and

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Glacier Basin (74.4%) and a smaller proportion at Mount Fremont (71.9%) and Comet Falls (67.0%).

Further analyses indicated a significant effect of day of week at three of the contact points. Figure 3.10 shows that at Summerland a smaller proportion of respondents contacted on weekdays than on the weekend were local Washingtonians (71.1% vs. 82.7%), $\chi^2 (1) = 3.94, p = .047$ (coded local Washington vs. all others). Comet Falls (see Figure 3. 11) showed the most dramatic effect with local Washington respondents comprising 36.0% of respondents contacted on weekdays but 67.0% of respondents contacted on the weekend, $\chi^2 (1) = 18.88, p < .001$ (coded local Washington, not local). Together, these findings suggest that local residents visit MORA on the weekend when they are not working and, therefore, comprise a greater proportion of visitors on weekends than on weekdays.

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FIGURE 3.8: CONTACT Q-3
ORIGIN OF WILDERNESS TRAIL RESPONDENTS TO GLACIER BASIN

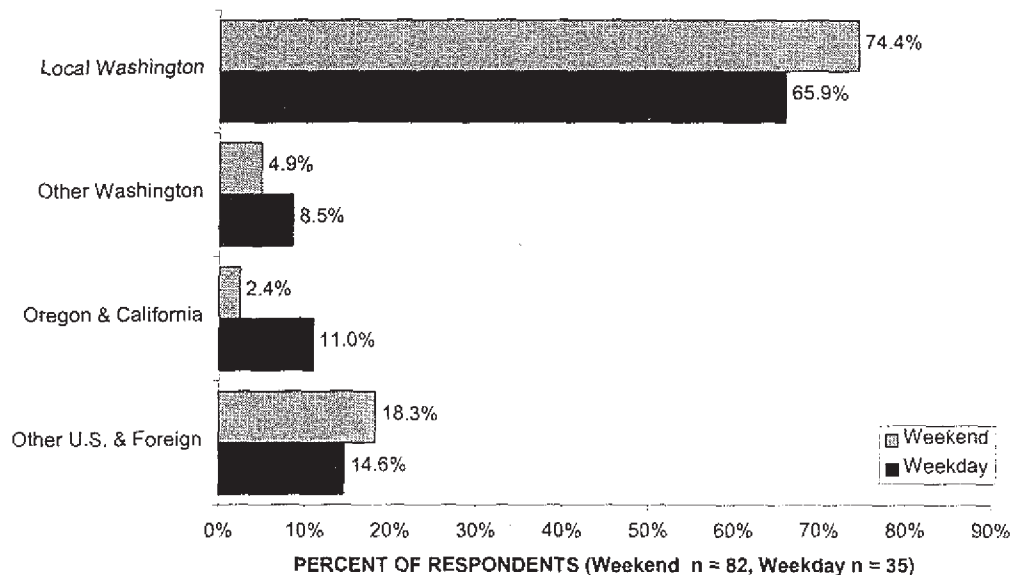
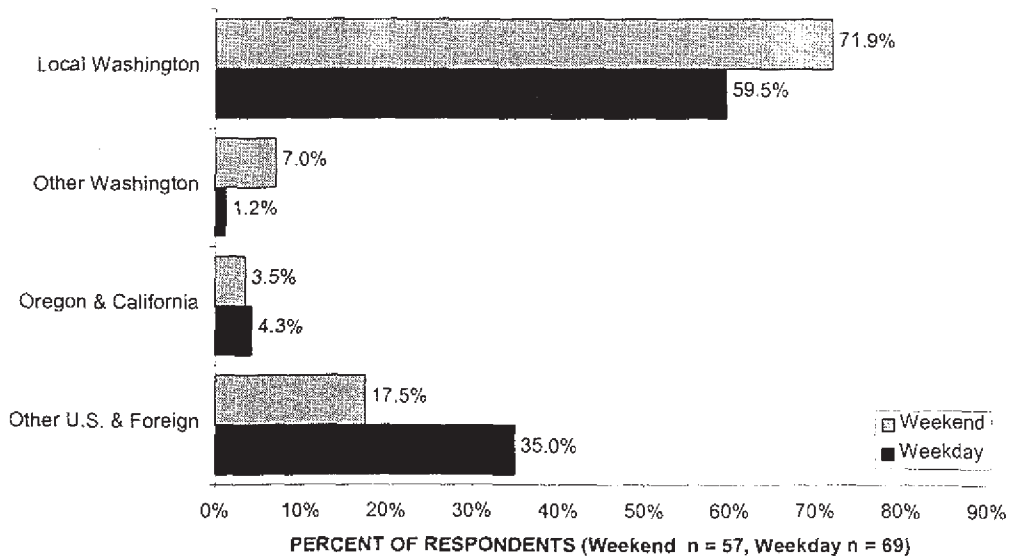


FIGURE 3.9: CONTACT Q-3
ORIGIN OF WILDERNESS TRAIL RESPONDENTS TO MOUNT FREMONT



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FIGURE 3.10: CONTACT Q-3
ORIGIN OF WILDERNESS TRAIL RESPONDENTS TO SUMMERLAND

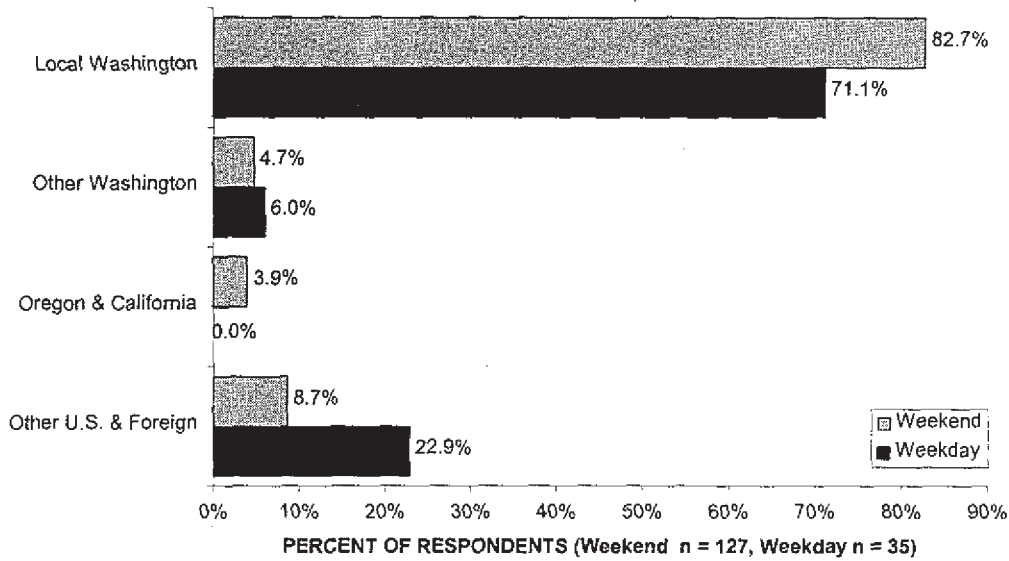
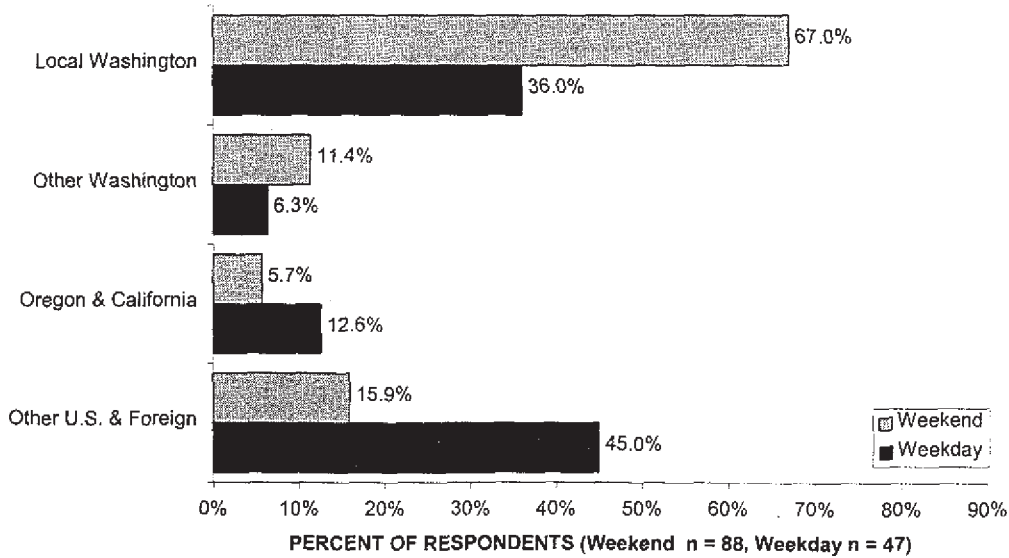


FIGURE 3.11: CONTACT Q-3
ORIGIN OF WILDERNESS TRAIL RESPONDENTS TO COMET FALLS



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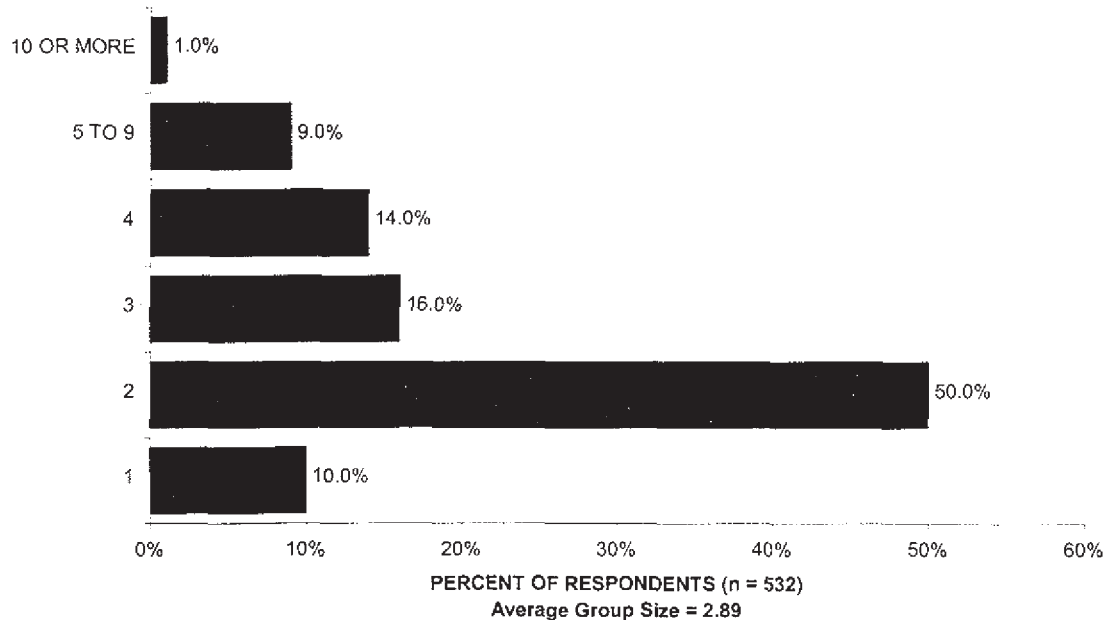
Size and Composition of Group

Groups contacted on the weekend were larger than groups contacted on weekdays ($M = 3.16$ vs. $M = 2.55$, respectively), $F(1, 705) = 21.19, p < .001$.

Figure 3.12 shows that the most frequent group size of respondents at the Wilderness Trails was two (50%); the next most common group sizes were three (16%) and four (14%). Approximately 10% of the respondents were alone and about 10% were in groups of five or more people.

A total of 23% of respondents' groups included children under age 16. Groups with one child present comprised 12% of all respondents; 7% of respondents had two children present and 4% had three or more children (see Figure 3.13).

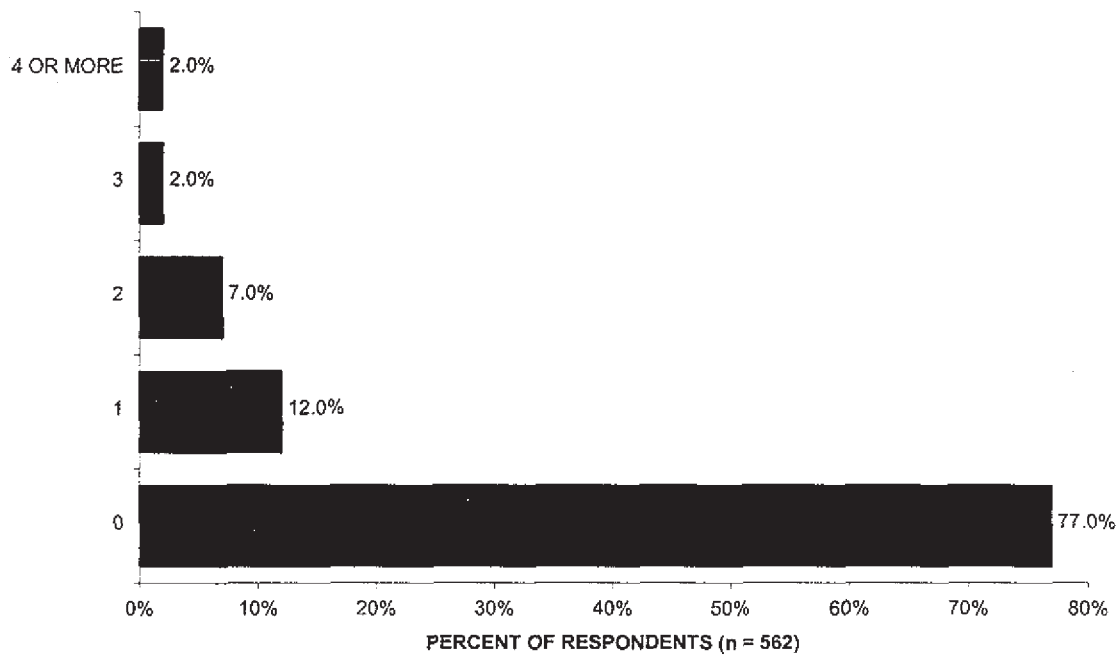
FIGURE 3.12: Contact Sheet Q-1
GROUP SIZE OF WILDERNESS TRAIL RESPONDENTS*



*These data were weighted to correct for overrepresentation of weekend visitors

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FIGURE 3.13: Contact Sheet Q-2
NUMBER OF CHILDREN UNDER AGE 16 IN GROUP



Type of Group

Group type varied significantly by day of week contacted, $\chi^2 (3) = 9.67, p = .022$. Over half (53.5%) of groups contacted on weekdays were comprised of family compared to 45.1% of groups contacted on the weekend and a smaller proportion of groups contacted on weekdays were comprised of family and friends than groups contacted on the weekend (7.4% vs. 16.4%) (see Figure 3.14).

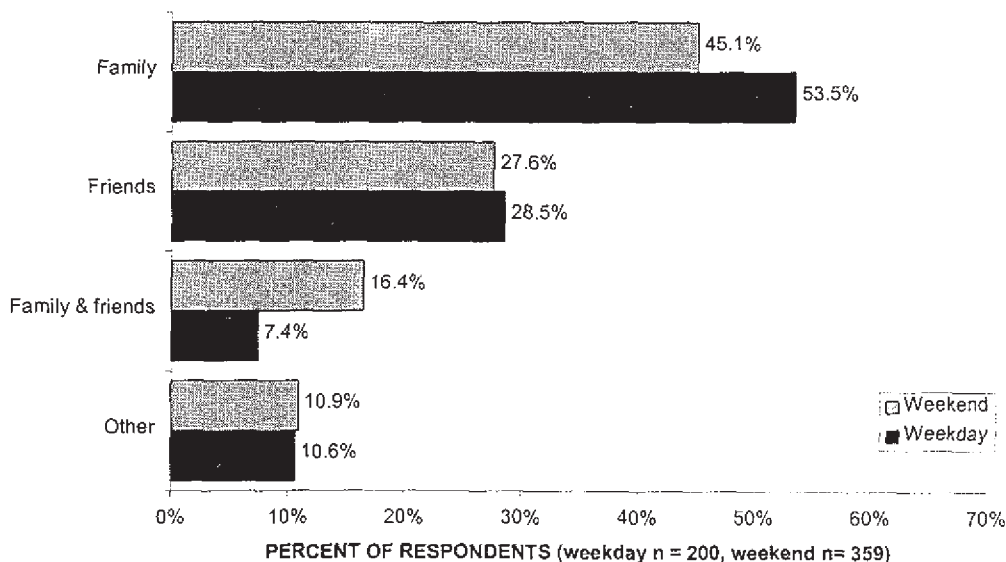
Further analyses indicated that the effect of day of week contacted varied by contact point. There was no effect of day of week on group type for respondents contacted at Mount Fremont or Comet Falls, p 's $> .12$ (see Figure 3.16 & Figure 3.18, respectively). For groups contacted at Summerland, a greater proportion of groups contacted on weekdays were comprised of family than groups

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contacted on the weekend (61.0% vs. 42.1%), while a larger proportion of groups contacted on the weekend were comprised of friends than groups contacted on weekdays (29.4% vs. 17.0%; see Figure 3.17), $\chi^2 (3) = 7.80, p = .050$.

Day of week contacted effects were also noted for Glacier Basin, $\chi^2 (3) = 27.08, p < .001$. Groups contacted on weekdays at Glacier Basin were almost exclusively comprised of Family (50%) or Friends (47.5%). For groups contacted on the weekend, Family groups were still 50% of groups, but groups comprised of Family & Friends (15.9%) and Other¹⁴ (13.4%) were more common while groups of Friends (20.7%) were less common (see Figure 3.15).

FIGURE 3.14: Q-27
GROUP TYPES BY DAY OF WEEK CONTACTED



¹⁴ The Other category was comprised of 3 smaller categories. Of the 11 respondents at Glacier Basin who comprise the 13.4% Other, 9 respondents hiked alone, 0 were part of an organized tour and 2 were other group types not specified.

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FIGURE 3.15: Q-27
GROUP TYPES AT GLACIER BASIN

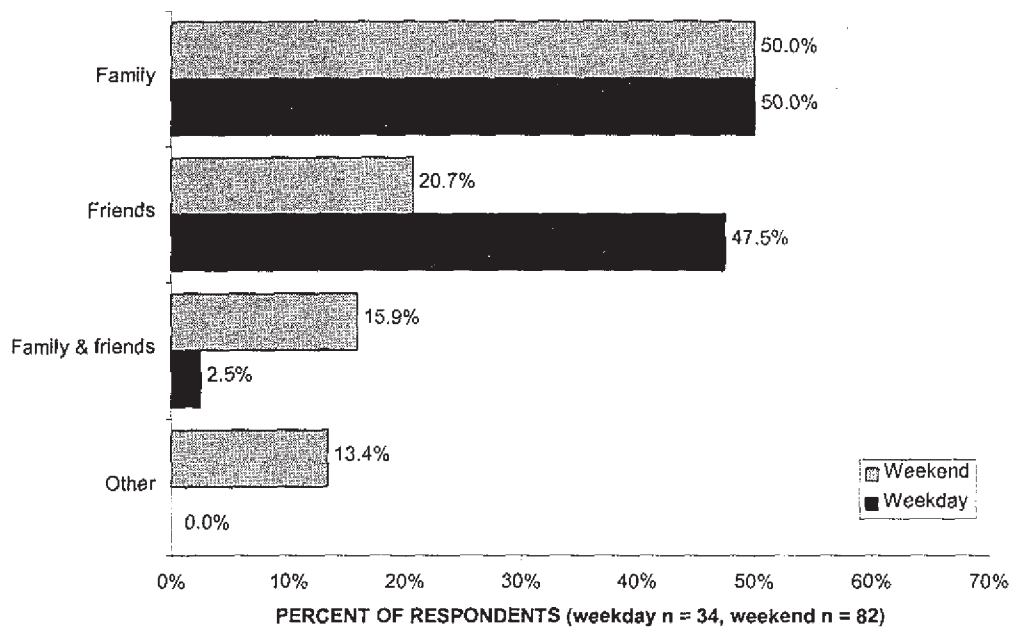
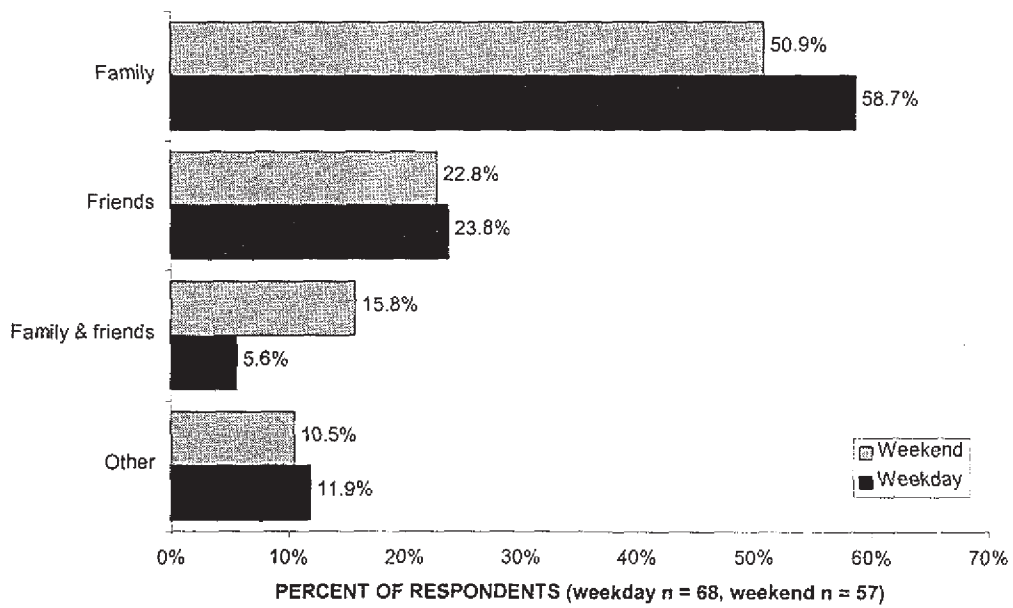


FIGURE 3.16: Q-27
GROUP TYPES AT MOUNT FREMONT



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FIGURE 3.17: Q-27
GROUP TYPES AT SUMMERLAND

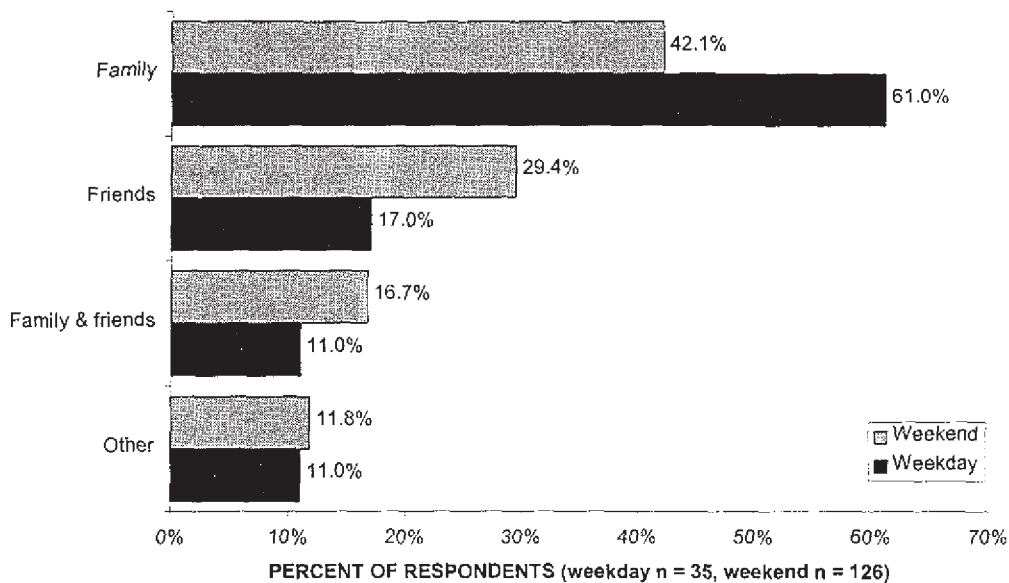
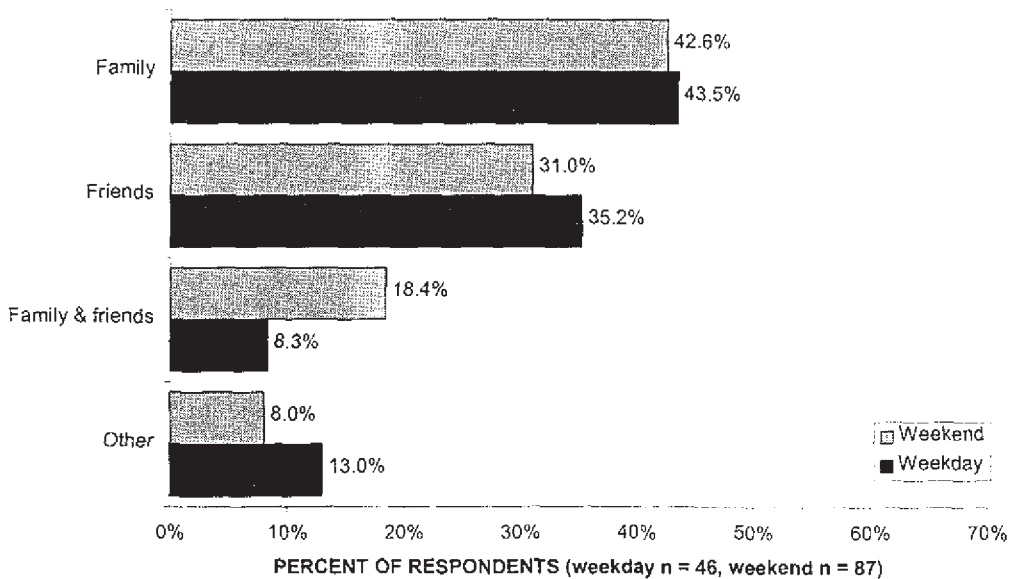


FIGURE 3.18: Q-27
GROUP TYPES AT COMET FALLS



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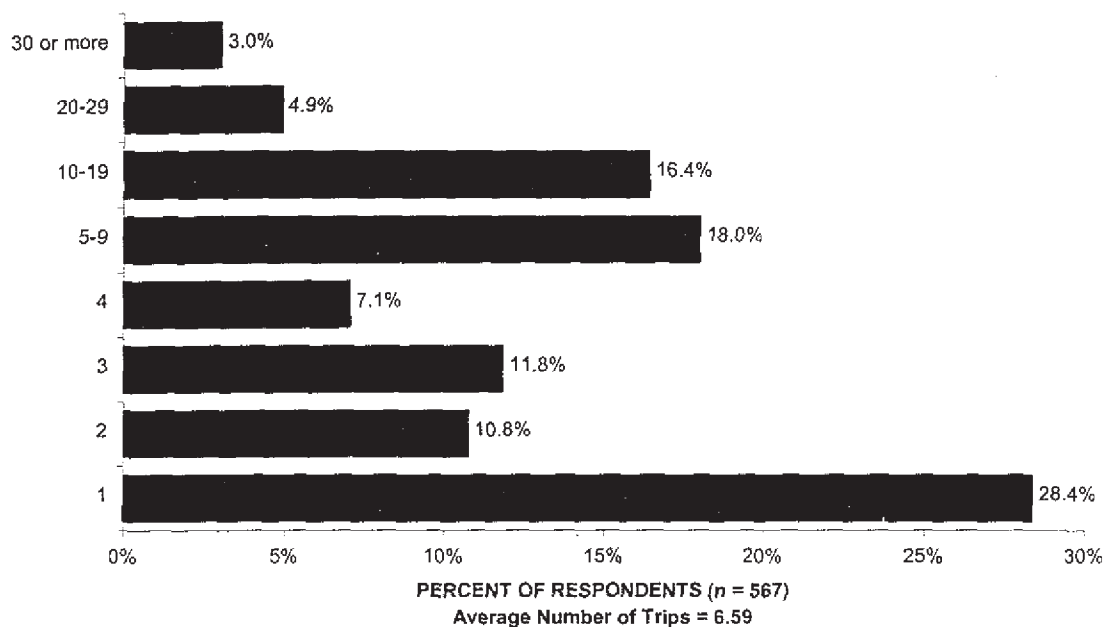
Number of Visits to MORA

Figure 3.19 shows that 28.4% of the wilderness trail respondents reported that this was their first visit to MORA in the last three years. On average, wilderness trail respondents had visited MORA 6.6 times in the previous three-year period.

A subset of wilderness trail respondents who may be of particular interest to MORA managers are those who most often visit MORA. Wilderness trail respondents who visited 20 or more times in the last three years made up 7.9% of the sample. However, they account for 34% of the total trips to MORA in the last three years that were reported by all respondents. If these respondents are excluded from the sample leaving only the respondents who had visited fewer than 20 times (92.1% of all respondents), the average number of trips to MORA in the last three years is 4.7 trips (compared to 6.6 trips for all respondents). Clearly, policies or information that affect this small group of MORA respondents will have a disproportionately large effect on conditions in the Park. Because of their potential to affect the Park, it would be wise to find out more about this group of respondents.

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FIGURE 3.19: Q-23
NUMBER OF TRIPS MADE TO MORA IN LAST 3 YEARS



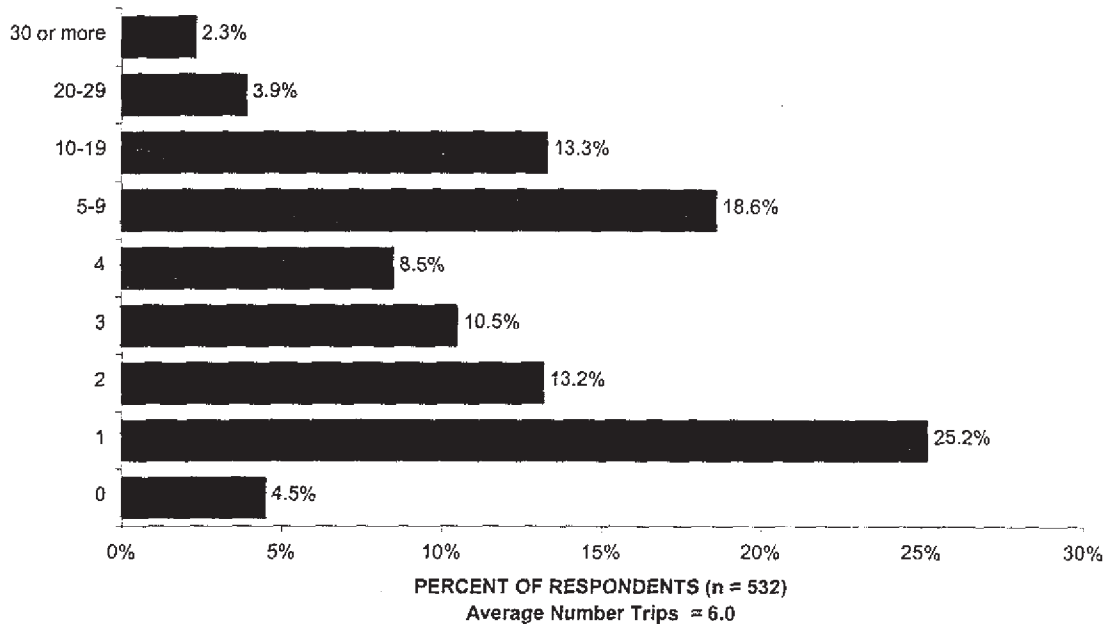
Trips with Hikes of more than 1 Mile

The average number of trips to MORA in the last three years with hikes or walks of more than a mile from a visitor center or road was 6.0. As seen in Figure 3.20, the distribution of responses to this question is very similar to that for the prior question about number of visits to MORA, suggesting that almost all WTS respondents hike more than one mile when they visit MORA. Although 57.4% of respondents had taken between 1 and 4 trips, there were 13.3% of respondents who had taken 10-19 trips and 6.2% who had taken 20 or more trips. Only 4.5% of

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respondents reported that none of their trips to MORA in the last 3 years had included hikes longer than 1 mile¹⁵.

FIGURE 3.20: Q-24
NUMBER OF TRIPS WITH WALKS/HIKES MORE THAN 1 MILE FROM
VISITOR CENTER OR ROAD



Awareness of Official Designations

Questions 25 and 26 in the mail survey explored wilderness trail users knowledge of official designations. Less than half (40%) of wilderness trail respondents reported being aware "that about 97% of MORA is officially designated by Congress as Wilderness" (see Figure 3.21). Also, less than half (40.5%) of wilderness trail respondents reported knowing that "natural areas officially designated as Wilderness are required by law to provide 'opportunities for

¹⁵ Because the question's instructions were not definitive, it is not clear whether the 4.5% reporting no trips with hikes greater than 1 mile intended to report that their hike on the trip when contacted was less than 1 mile.

III. Visitor Profile

solitude' and to be managed 'so that the imprint of man is substantially unnoticeable'" (see Figure 3.22). Although these "don't know" rates are high (over 50%), these estimates are most likely conservative as people have a bias against admitting ignorance.

Knowledge that wilderness designation requires providing "opportunities for solitude' and to be managed 'so that the imprint of man is substantially unnoticeable'", however, varied significantly by contact point, $\chi^2(3) = 10.15$, $p = .017$. As seen in Figure 3.23, Comet Falls had a larger proportion of respondents who "did not know" than the other three contact points (Glacier Basin, Summerland, & Mount Fremont) which did not differ significantly. Comet Falls is often recommended by park personnel to nonlocal or inexperienced visitors looking for a hike. These visitors tend to be relatively unfamiliar with MORA including information regarding its official designations. Likewise, Summerland is another highly recommended trail to nonlocal or inexperienced visitors looking for a hike, and respondents contacted at Summerland had a higher "don't know" rate than respondents contacted at Mount Fremont or Glacier Basin. This process of referring significant numbers of visitors to wilderness designated areas can be seen as a fundamental contradiction with the wilderness mandate.

III. Visitor Profile

FIGURE 3.21: Q-25
AWARENESS THAT ABOUT 97% OF MORA IS OFFICIALLY DESIGNATED BY CONGRESS AS WILDERNESS

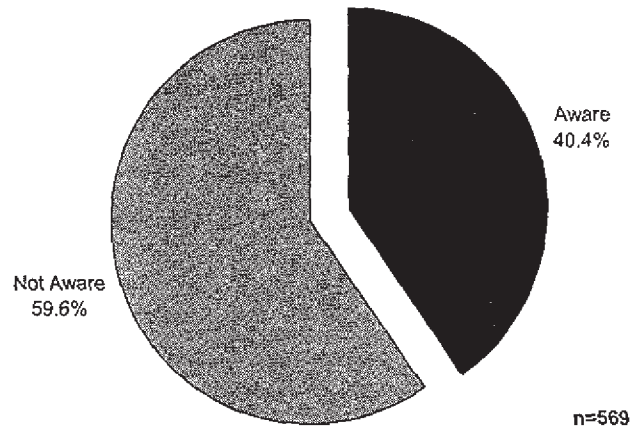
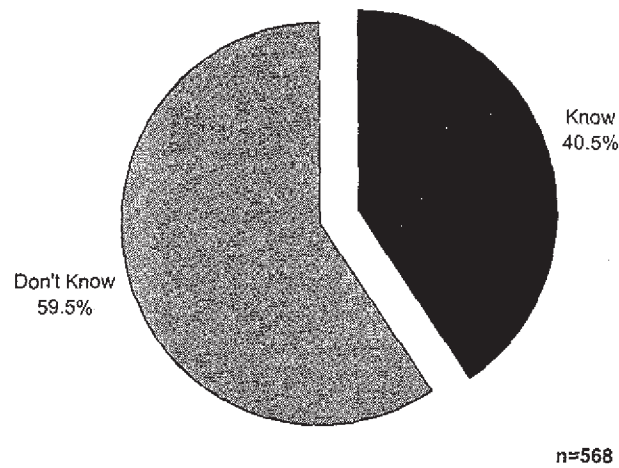
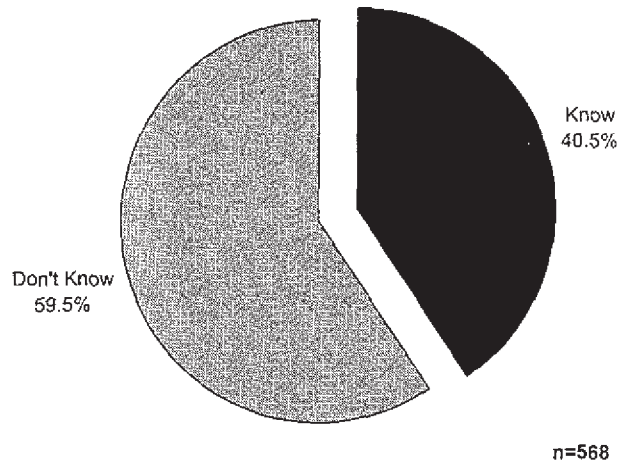


FIGURE 3.22: Q-26
KNOWS THAT WILDERNESS DESIGNATION REQUIRES PROVIDING "OPPORTUNITIES FOR SOLITUDE" AND MANAGED "SO IMPRINT OF MAN IS SUBSTANTIALLY UNNOTICEABLE"



III. Visitor Profile

FIGURE 3.22: Q-26
KNOW THAT WILDERNESS DESIGNATION REQUIRES PROVIDING "OPPORTUNITIES FOR SOLITUDE" AND MANAGED "SO IMPRINT OF MAN IS SUBSTANTIALLY UNNOTICEABLE"



IV. TRIP CHARACTERISTICS

A wide range of questions in the WTVS asked wilderness trail respondents about their trip to the MORA. This section reports the data that were collected with these questions. It is organized in the chronological order of most trips, moving from trip planning to a description of the trip.

IV. Trip Characteristics

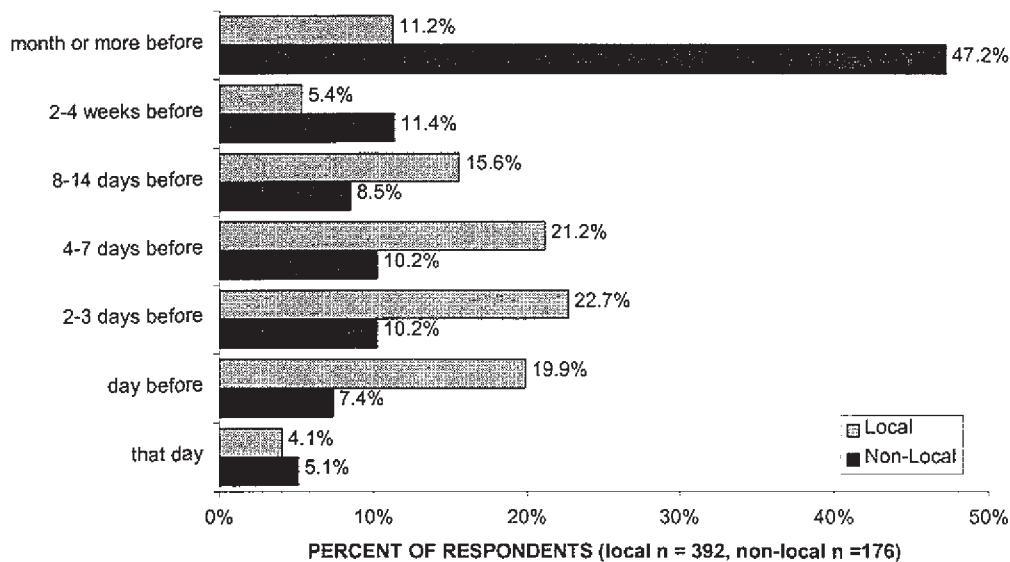
IV. Trip Characteristics

Planning the Trip

When respondents decided to visit. The time elapsed since making the decision to visit MORA varied significantly by day of week contacted, $\chi^2(6) = 17.45$, $p = .008$. Additional analyses indicated that this day of week contacted effect was being driven by differences in respondents' residence, $\chi^2(6) = 111.10$, $p < .001$. Figure 4.1 shows that a larger proportion of non-local respondents made their decision to visit MORA a month or more before their visit than local respondents (47.2% vs. 11.2%), while a larger proportion of local respondents made their decision between 1 and 14 days before their visit than non-local respondents (79.4% vs. 36.3%). Regardless of residence, 24.8% (nonlocal = 47.2%, local = 11.2%) of respondents planned their trip a month or more in advance, and over half (non-local = 27.8%, local = 63.8%) of respondents planned their visit in the last week. Only 4.4% of respondents decided on that day to visit MORA.

IV. Trip Characteristics

FIGURE 4.1: Q-1
TIME WHEN DECISION TO VISIT MORA WAS MADE



Information sought prior to visit. Over half (55%) of respondents sought information about MORA before their visit (see Figure 4.2). Differences in day of week contacted effects across contact points were found to reflect differences in residence across contact points. Figure 4.3 shows that at all contact points a larger proportion of non-local than local respondents sought information. The difference between non-local and local respondents seeking information at Summerland, however, was not significant, $\chi^2(1) = 2.43$, $p = .119$, and the difference between non-local and local respondents was greatest at Comet Falls, $\chi^2(1) = 16.87$, $p < .001$. A better understanding of how respondents who sought information prior to their visit differ from respondents who did not seek information would be advantageous. Investigation of such differences would be possible with further analyses.

IV. Trip Characteristics

FIGURE 4.2: Q-2
SOUGHT INFORMATION ABOUT MORA PRIOR TO VISIT

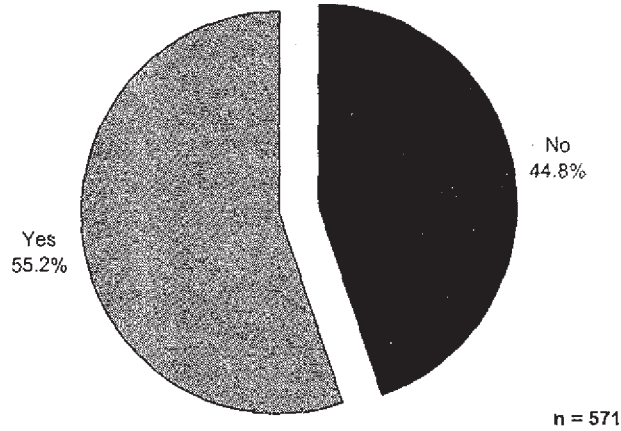
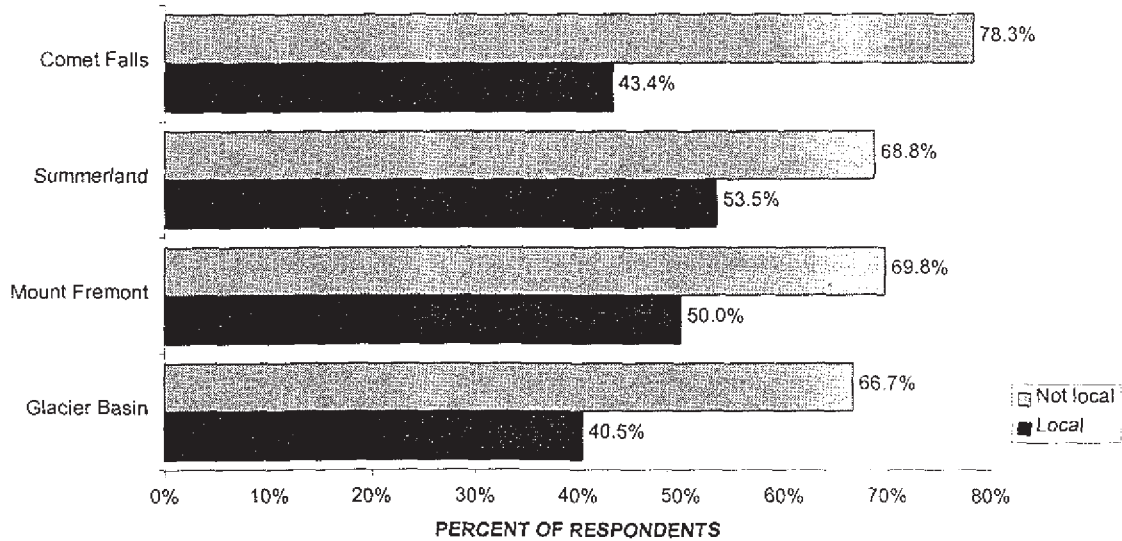


FIGURE 4.3: Q-2
SOUGHT INFORMATION ABOUT MORA PRIOR TO VISIT BY CONTACT POINT BY RESIDENCE



IV. Trip Characteristics

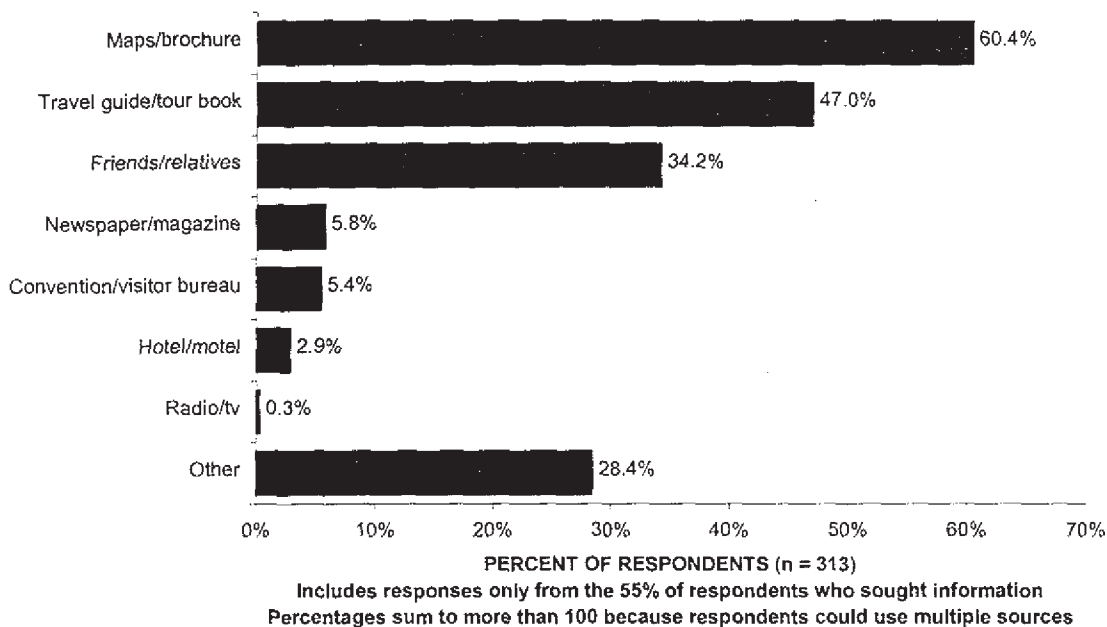
Of those who sought information, Figure 4.4 shows that maps/brochures were the most common sources used (60.4% of respondents seeking information). The effects of day of week contacted and contact point were investigated for each source of information. When day of week contacted effects were due to respondents residence, only the findings for residence are reported.

As shown in Figure 4.5, a larger proportion of non-local Mount Fremont respondents reported using a travel guide/tour book than local Mount Fremont respondents (80.0% vs. 37.7%), $\chi^2(1) = 12.55, p < .001$.

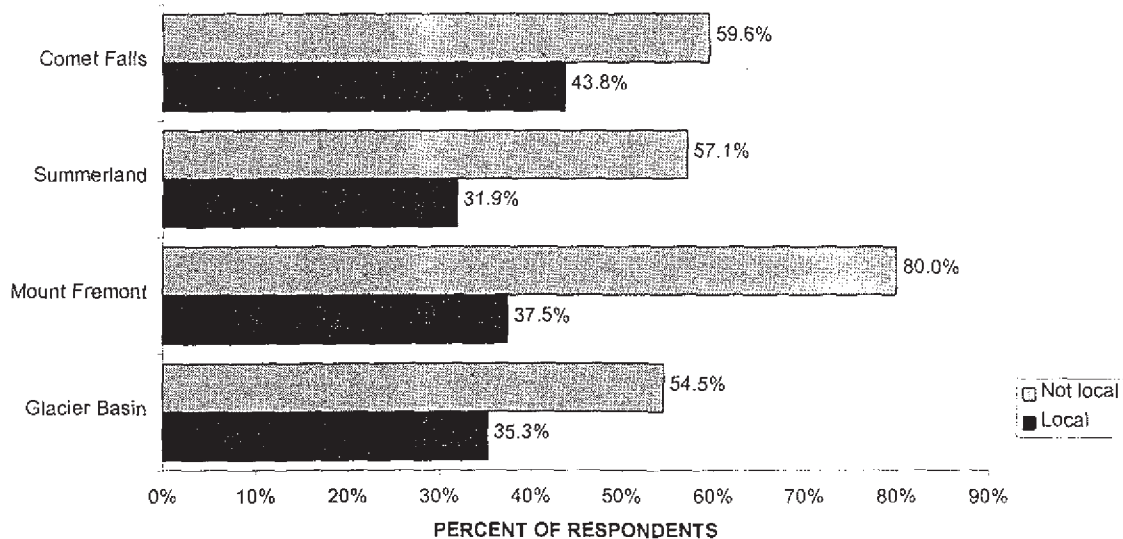
Day of week contacted effects (that were not due to residence) differed by contact point for newspaper/magazine and convention/visitor bureau; however, due to the small number of people using these sources (less than 10% of sample) they are not reported here.

IV. Trip Characteristics

**FIGURE 4.4: Q-2b
SOURCES FROM WHICH INFORMATION WAS SOUGHT**



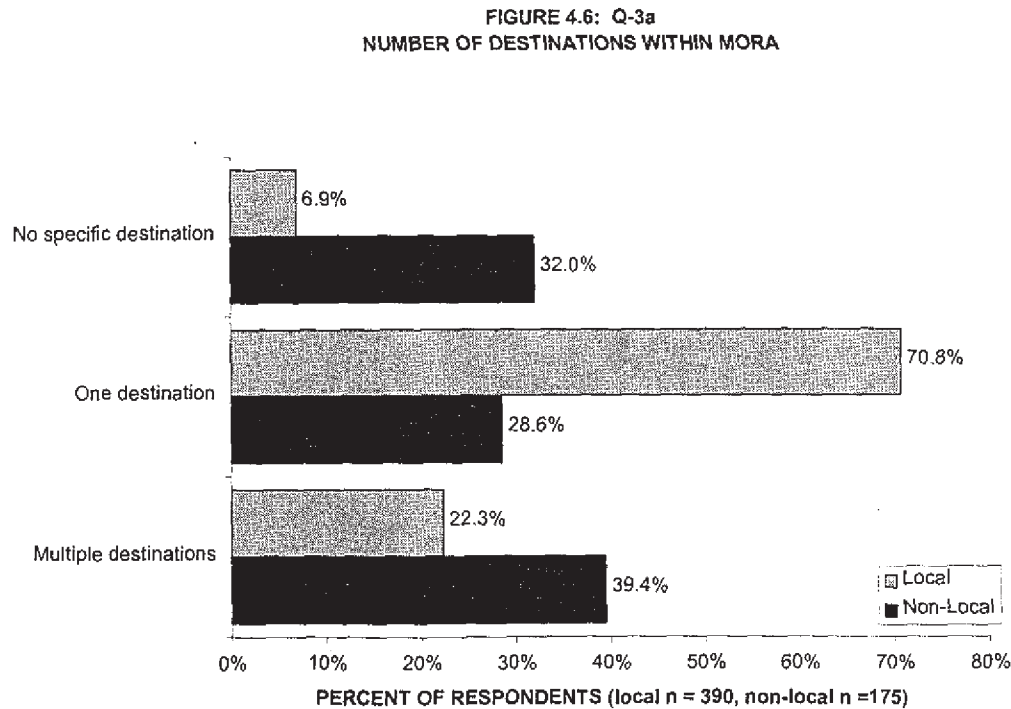
**FIGURE 4.5: Q-2
PERCENT OF RESPONDENTS SEEKING INFORMATION FROM TRAVEL GUIDE/TOUR BOOK**



IV. Trip Characteristics

Planned destination. Number of destinations varied by day of week contacted, $\chi^2(2) = 26.52$, $p < .001$. Further analysis indicated that these effects were being driven by differences in local and non-local respondents, $\chi^2(2) = 101.81$, $p < .001$.

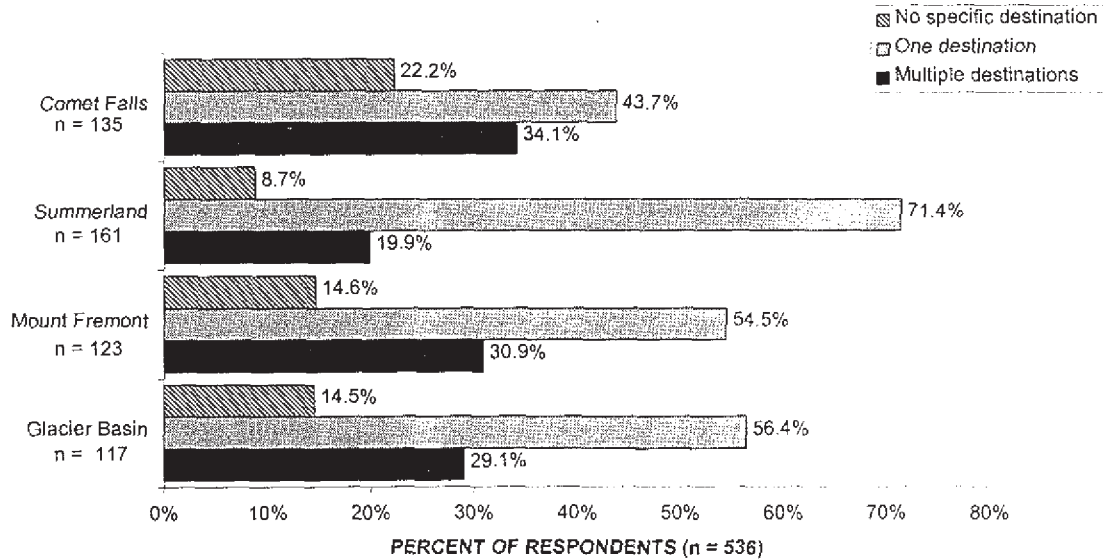
Figure 4.6 shows that a larger proportion of local respondents had one destination in mind than did non-local respondents (70.8% vs. 28.6%). Additionally, only 6.9% of local respondents contacted had no specific destination before entering MORA compared to 32.0% of non-local respondents. These findings reflect that many local users come to MORA to do a specific dayhike.



IV. Trip Characteristics

Number of destinations also varied by contact point, $\chi^2(6) = 25.27, p < .001$. For respondents contacted at Glacier Basin, Mount Fremont, or Comet Falls, the proportions of respondents who had one destination, multiple destinations, or no specific destination did not vary. Compared to respondents contacted at the other three points, respondents contacted at Summerland were more likely to have one destination (71.4% vs. 43.7%, 54.5%, or 56.4%). Summerland is the only contact point that is neither on a through-road nor accessed from a front country destination and, therefore, respondents would not be able to just stop at another place "on the way".

FIGURE 4.7: Q-3a
NUMBER OF DESTINATIONS BY CONTACT POINT

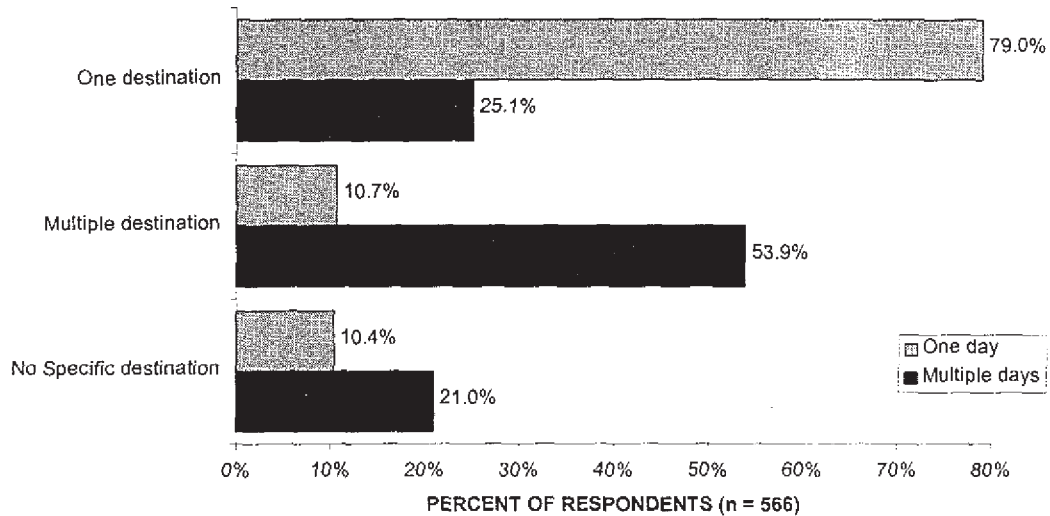


IV. Trip Characteristics

It may be that observed differences for residence are due to the number of days spent in MORA. As noted later (see p. 70), more local respondents spent one day in the park and more non-local respondents spent multiple days in the park. It is reasonable that people who spend multiple days in MORA would have more destinations than people who spend a single day in MORA. Analysis showed that number of destinations within MORA varied by number of days spent in MORA, $\chi^2(2) = 54.67, p < .001$. Figure 4.8 shows that a larger proportion of respondents spending only one day in MORA had a single destination than either multiple destinations or no specific destination (79.0% vs. 10.7% & 10.4%, respectively). A larger number of respondents spending multiple days in MORA had multiple destinations than either single destinations or no specific destination (53.9% vs. 25.1% & 21.0%). Additional analyses revealed that place of residence effects could not be explained completely by number of days spent in MORA. These findings suggest that part of the difference between local and non-local respondents can be explained as occurring because non-local visitors spend more time in MORA than local visitors. Thus, people who have a single destination are more likely to be weekend day-hikers while people who have multiple destinations are more likely to be spending multiple days at MORA.

IV. Trip Characteristics

FIGURE 4.8: Q-3A
NUMBER OF DESTINATIONS WITHIN MORA BY NUMBER OF DAYS STAY IN MORA



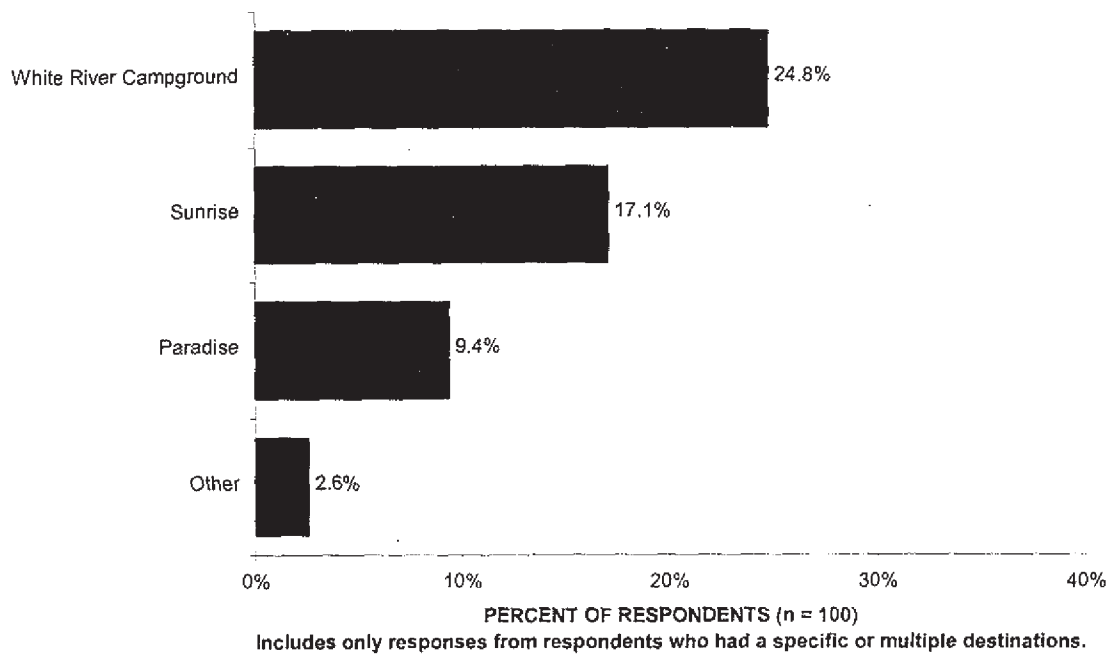
*Data were weighted to correct for the overrepresentation of visitors contacted on the weekend

Specific destinations. In question 3b of the mail questionnaire, frontcountry destinations were defined as “man-made facilities and roads, and the natural areas that are in the immediate vicinity of such facilities”. Backcountry destinations were defined as “hiking trails or natural features of the park that extend more than a half-mile from man-made facilities or roads”. Respondents who had indicated that they had one or more specific destinations were asked to list those that were frontcountry and those that were backcountry. These data are reported for each contact point and only destinations that were listed by 5% or more of respondents were included in the charts.

IV. Trip Characteristics

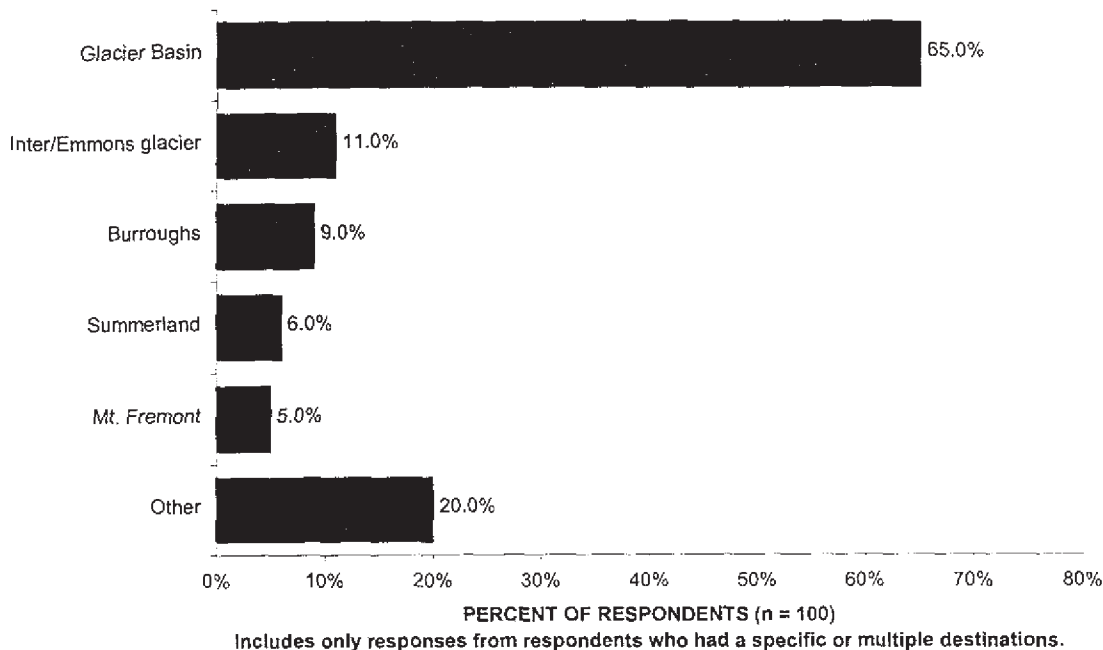
Glacier Basin. One quarter (24.8%) of the respondents contacted at Glacier Basin specified White River Campground, and 17.1% specified Sunrise as a frontcountry destination (see Figure 4.9). Figure 4.10 shows that the most common backcountry destination for Glacier Basin respondents was Glacier Basin (65%).

FIGURE 4.9: Q-3b
GLACIER BASIN RESPONDENTS' FRONT COUNTRY DESTINATIONS



IV. Trip Characteristics

FIGURE 4.10: Q-3b
GLACIER BASIN RESPONDENTS' BACK COUNTRY DESTINATIONS



Mount Fremont. The most common frontcountry destination of respondents contacted at Mount Fremont was Sunrise (39.0%) followed by Paradise (19.0%) (see Figure 4.11). Over half (53.3%) of respondents contacted at Mount Fremont specified Mount Fremont as a backcountry destination (see Figure 4.12).

IV. Trip Characteristics

FIGURE 4.11: Q-3b
MOUNT FREMONT RESPONDENTS' FRONT COUNTRY DESTINATIONS

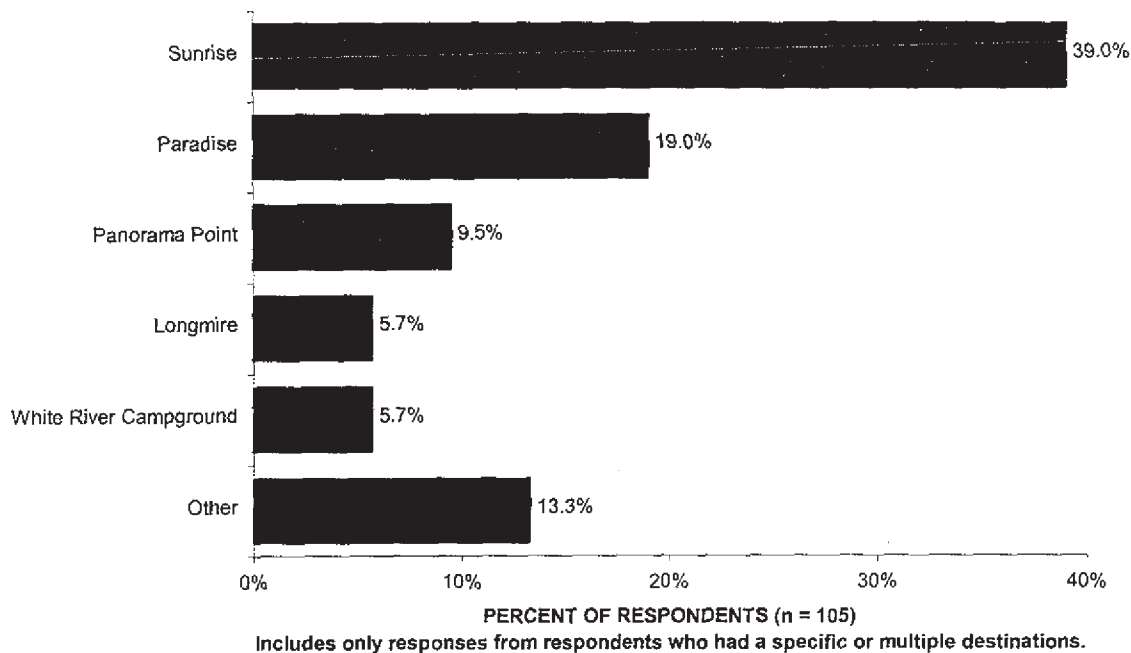
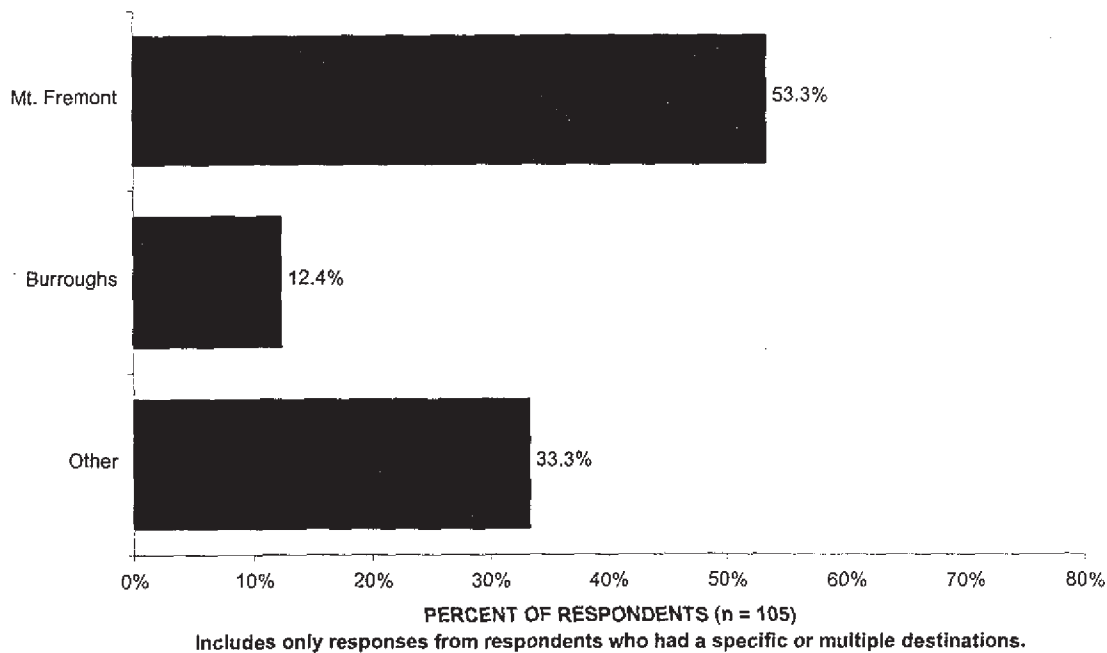


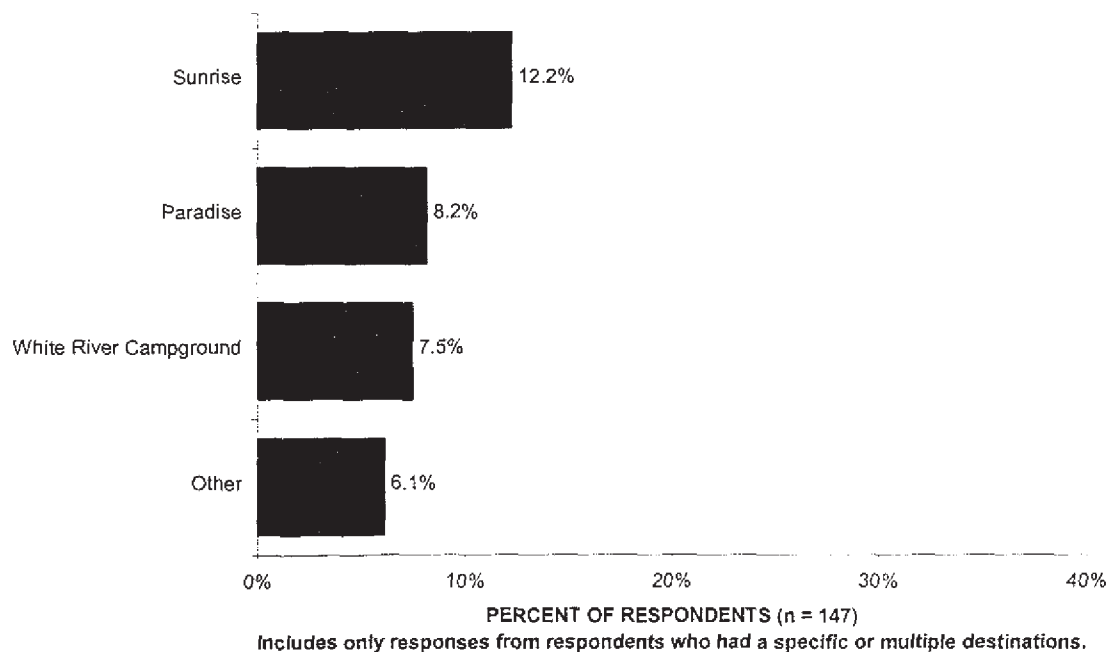
FIGURE 4.12: Q-3b
MOUNT FREMONT RESPONDENTS' BACK COUNTRY DESTINATIONS



IV. Trip Characteristics

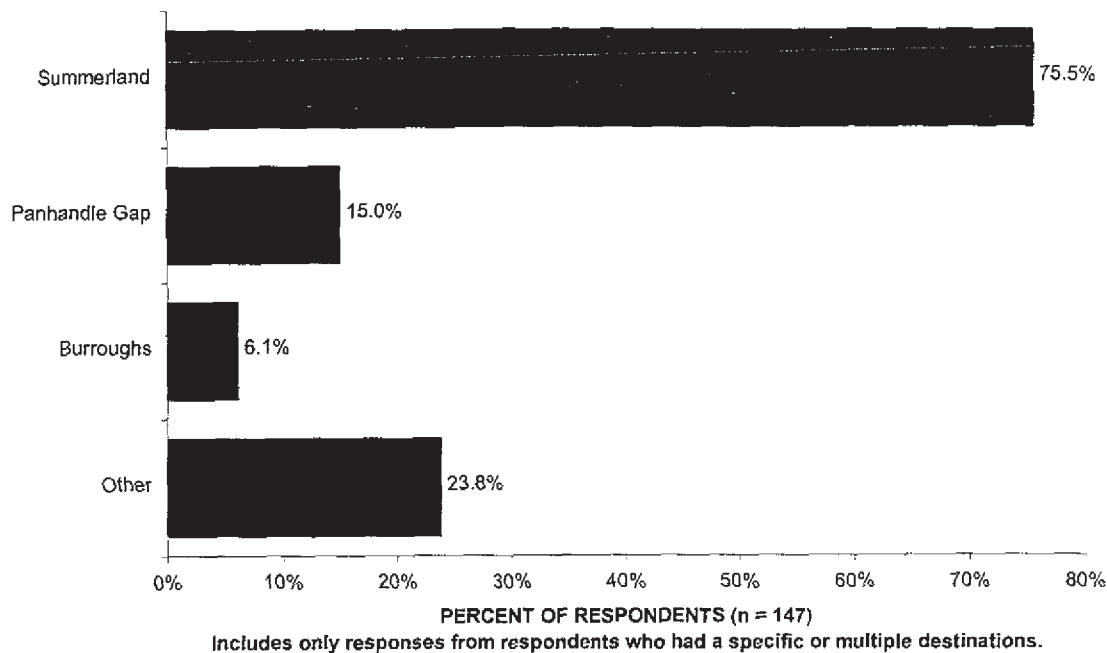
Summerland. Figure 4.13 reveals that no frontcountry destination was specified by more than 13% of Summerland respondents. Sunrise (12.2%) was the most common frontcountry specified followed by Paradise (8.2%) and White River Campground (7.5%). Three-quarters (75.5%) of respondents contacted at Summerland listed Summerland as a backcountry destination (see Figure 4.14). The lower number of respondents contacted at Summerland listing a front country destination than at other contact points is most likely because it is not accessed through a front country destination as are Mount Fremont or Glacier Basin. Compared to Comet Falls, which is the other contact point not accessed from a frontcountry destination, Summerland is much more a single destination site. Very few respondents contacted at Summerland had either a frontcountry destination or other backcountry destinations.

FIGURE 4.13: Q-3b
SUMMERLAND RESPONDENTS' FRONT COUNTRY DESTINATIONS



IV. Trip Characteristics

FIGURE 4.14: Q-3b
SUMMERLAND RESPONDENTS' BACK COUNTRY DESTINATIONS



Comet Falls. Paradise was the most common (31.4%) frontcountry destination listed by respondents contacted at Comet Falls (see Figure 4.15). Comet Falls was listed by 42.9% of respondents as a backcountry destination and Van Trump Meadows which is further past Comet Falls on the trail was listed by 31.4% (see Figure 4.16). Compared to Summerland (the only other contact point not accessed from a front country facility), Comet Falls is visited by many more people with front country destinations. It is the least "single destination" site of all the contact points.

IV. Trip Characteristics

FIGURE 4.15: Q-3b
COMET FALLS RESPONDENTS' FRONT COUNTRY DESTINATIONS

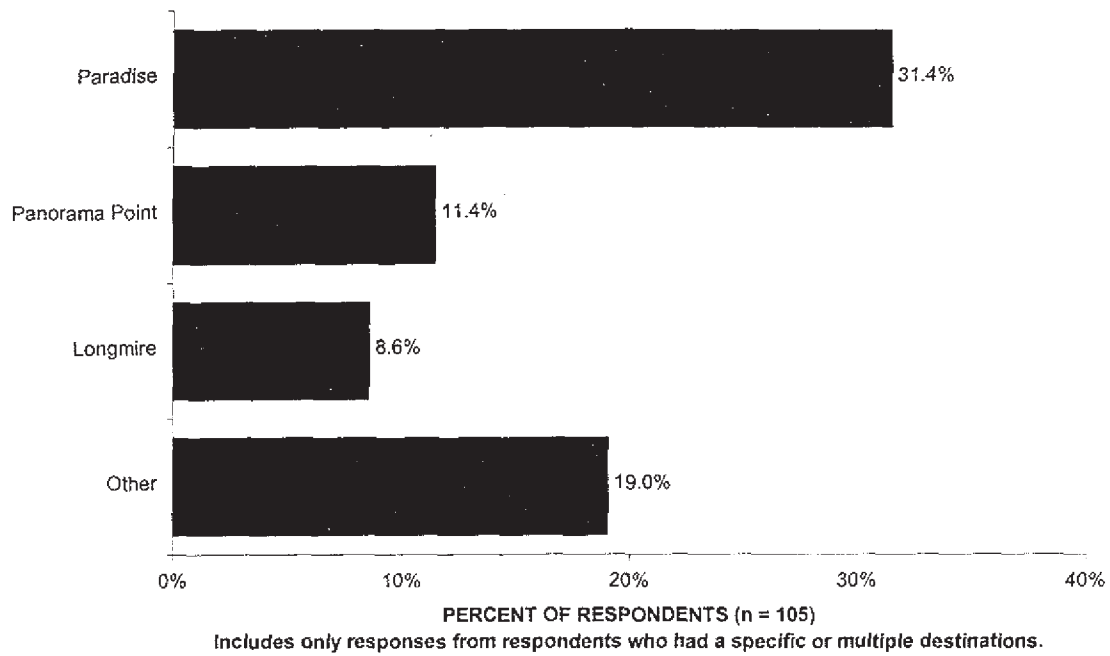
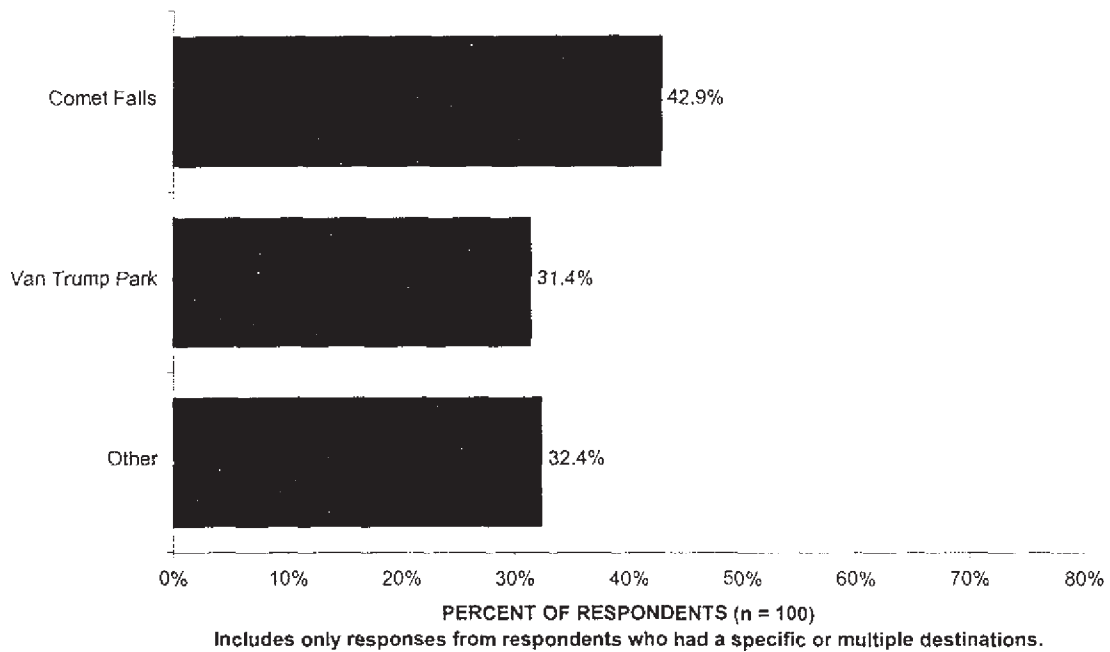


FIGURE 4.16: Q-3b
COMET FALLS RESPONDENTS' BACK COUNTRY DESTINATIONS



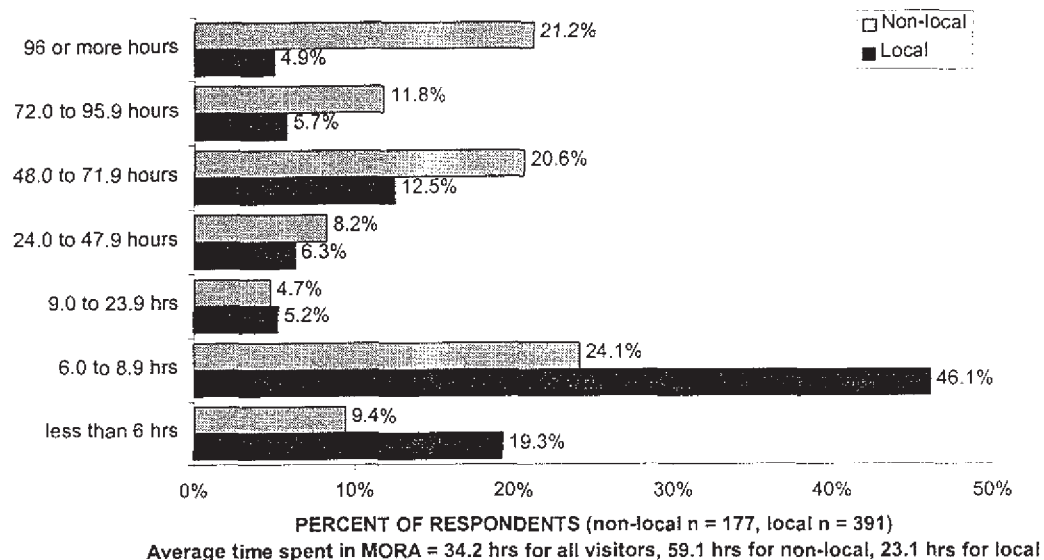
IV. Trip Characteristics

Time in MORA

The average amount of time spent for respondents contacted on weekdays ($M = 43.8$ hours) was significantly greater than that of respondents contacted on the weekend ($M = 30.0$ hours), $F(1, 516) = 6.93, p = .009$. Further analyses revealed that the day of week contacted effect was being driven by differences in respondents' residence, $F(1, 543) = 40.81, p < .001$. Figure 4.17 shows that a larger proportion of nonlocal respondents spent between 2 or more days (48 hours or more) in MORA than local respondents (53.6% vs. 23.1%). Although the greatest proportion of respondents spent from 6.0 – 8.9 hours in MORA regardless of day of week contacted, this proportion was larger for local respondents (46.1%) than for nonlocal respondents (24.1%). These findings suggest that local respondents were more likely to be on a day trip to MORA while nonlocal respondents were more likely to be spending multiple days at MORA.

IV. Trip Characteristics

FIGURE 4.17: Q-4
TOTAL TIME SPENT IN MORA BY RESIDENCE

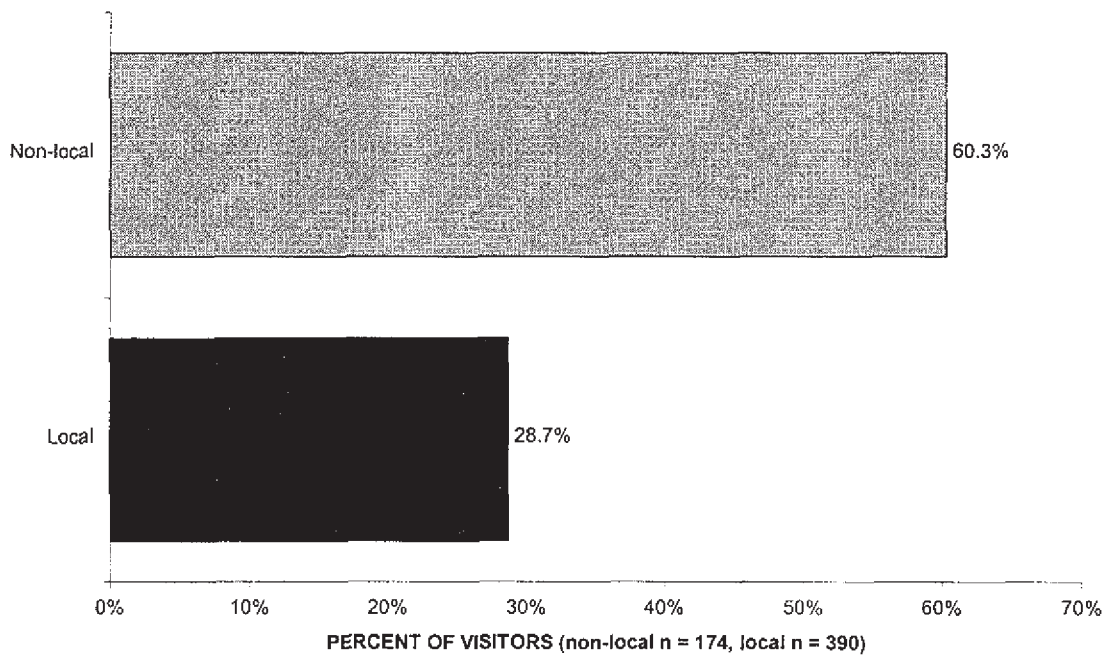


Other variables of interest such as number of planned destinations or ways of experiencing MORA may depend on whether respondents were on a day trip or overnight trip. If day trips are more common for local respondents and overnight trips more common for nonlocal respondents, then observed differences for local versus nonlocal respondents may be explained by the number of days spent in MORA (one day versus multiple days). To examine the relationship between number of days spent in MORA and residence, respondents who spent less than 18 hours in MORA were classified as spending one day at MORA and those who spent more than 18 hours were classified as spending multiple days at MORA. As shown in Figure 4.18, fewer local respondents spent multiple days at MORA than did nonlocal respondents (28.7% vs. 60.3%, respectively), $\chi^2(1) = 50.84$, $p = .001$. In addition, number of days spent in MORA varied

IV. Trip Characteristics

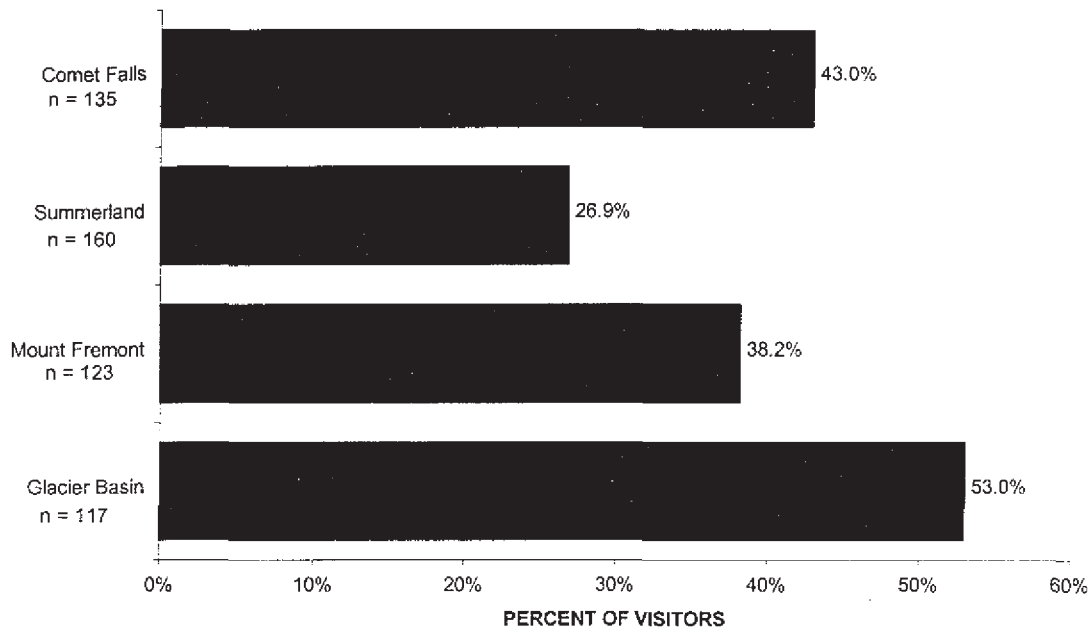
by contact point. As seen in Figure 4.19, respondents contacted at Mount Fremont and Summerland were less likely to spend multiple days in MORA. These findings are consistent with the increased weekend-oriented local visitation that was noted earlier (see p.36).

FIGURE 4.18: Q-4
PROPORTION OF RESPONDENTS WHO STAYED MULTIPLE DAYS BY RESIDENCE



IV. Trip Characteristics

FIGURE 4.19: Q-4
PROPORTION OF RESPONDENTS WHO SPENT MULTIPLE DAYS IN MORA BY CONTACT POINT



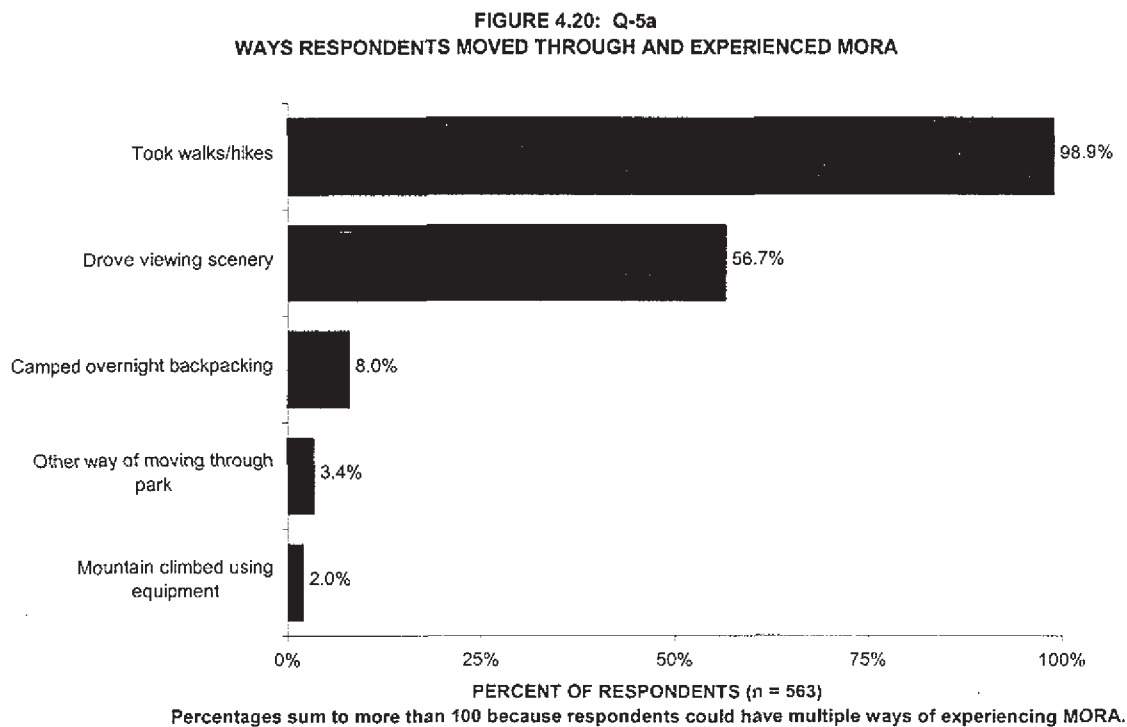
Overall, these analyses suggest that for some variables observed differences between local and nonlocal respondents may be because local respondents are more likely on a day trip and nonlocal respondents are more likely staying multiple days in MORA. This possibility is addressed for variables where number of days is hypothesized as a reasonable explanation of observed differences due to residence. Results are reported in the section corresponding to the variable of interest.

Ways of Experiencing MORA

Questions 5a through 5c focused on three broad ways respondents may experience MORA: 1) ways respondents moved through and experienced the park environment, 2) outdoor activities engaged in, and 3) park facility activities.

IV. Trip Characteristics

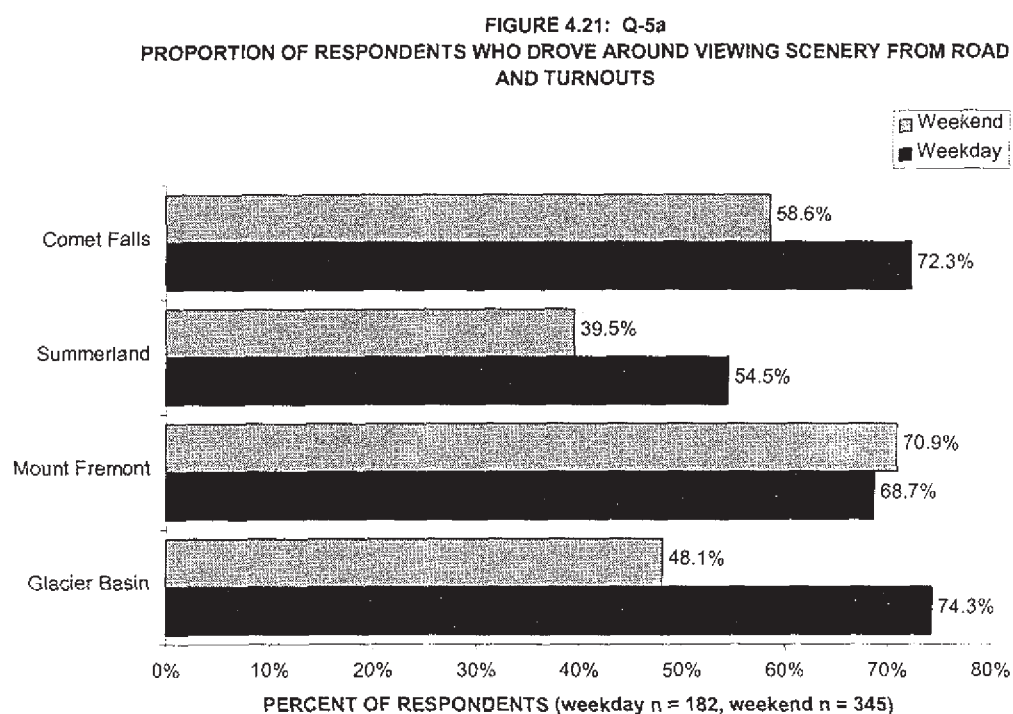
Ways of moving through and experiencing the park. Not surprising for a wilderness trail survey, the overwhelming majority of respondents (98.9%) indicated that they moved through and experienced the park by taking walks or hikes (see Figure 4.20).



The effect of day of week contacted and contact point was investigated for each way of moving through and experiencing the park. Review of Figure 4.21 shows that driving around viewing scenery from road and turnouts was a more common way of moving through and experiencing the park for respondents contacted on weekdays than on weekends (65.8% vs. 51.1%), $\chi^2(1) = 11.16$, $p = .001$. Further analyses indicated that the day of week contacted effect depended on respondents' residence. The proportion of local respondents who drove around viewing scenery did not differ by day of week

IV. Trip Characteristics

contacted (weekday: 51.8% vs. weekend: 45.8%), $\chi^2(1) = 1.11$, $p = .290$. The proportion of nonlocal respondents who drove around viewing scenery, however, was greater for those contacted on the weekday (84.7%) than the weekend (67.0%), $\chi^2(1) = 7.34$, $p = .007$. Overall, more nonlocal respondents drove around viewing scenery from road and turnouts than local residents (78.7% vs. 47.9%, respectively), $\chi^2(1) = 38.07$, $p < .001$.



The sample was weighted to correct for the overrepresentation of respondents contacted on the weekend, and these data were used to examine contact point effects. At Comet Falls, Summerland, and Glacier Basin, a larger proportion of respondents contacted on weekdays drove around viewing scenery from the road and turnouts than respondents contacted on the weekend, all p 's $< .046$ (see Figure 4.21). It is reasonable

IV. Trip Characteristics

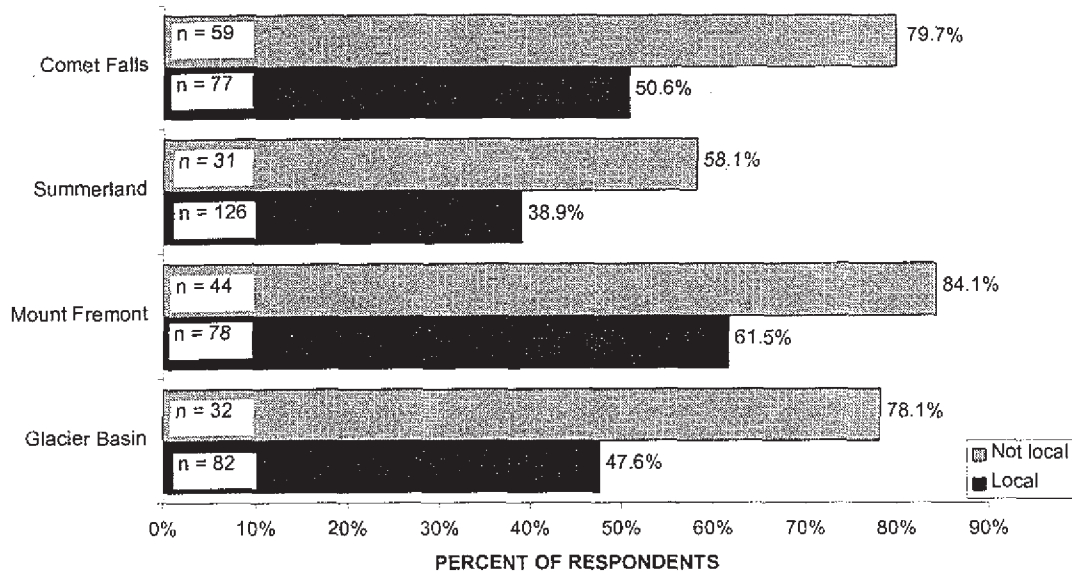
that Mount Fremont respondents contacted on weekends and weekdays did not differ in driving around viewing scenery, $\chi^2(1) = 0.11$, $p = .744$, as driving around viewing scenery is inherent in the drive up to Sunrise, the most common access to Mount Fremont.

Regardless of day of week contacted, respondents to Summerland were less likely to drive around viewing scenery than respondents to the other three contact points (45.3% vs. 61.5%, 69.2%, and 66.0%), $\chi^2(3) = 28.83$, $p < .001$.

Differences in the proportion of local and nonlocal respondents who drove around viewing scenery were observed for all contact points (see Figure 4.22), although this difference was the smallest at Summerland ($p = .053$ vs. p 's ranging from .009 to .001). Thus, fewer respondents contacted at Summerland driving around viewing scenery can be explained as due to fewer local visitors contacted on weekdays than weekends. It may be that local visitors are more likely to focus on the specific hike and place little emphasis on the drive because they have increased opportunity to visit MORA relative to non-local visitors.

IV. Trip Characteristics

FIGURE 4.22: Q-5a
PROPORTION OF RESPONDENTS WHO DROVE AROUND VIEWING SCENERY FROM ROAD AND TURNOUTS



Day of week contacted effects differed by contact point for Camping overnight while backpacking and Other ways of moving through and experiencing MORA, however, due to the small number of people reporting these activities (less than 10% of sample) they are not reported here.

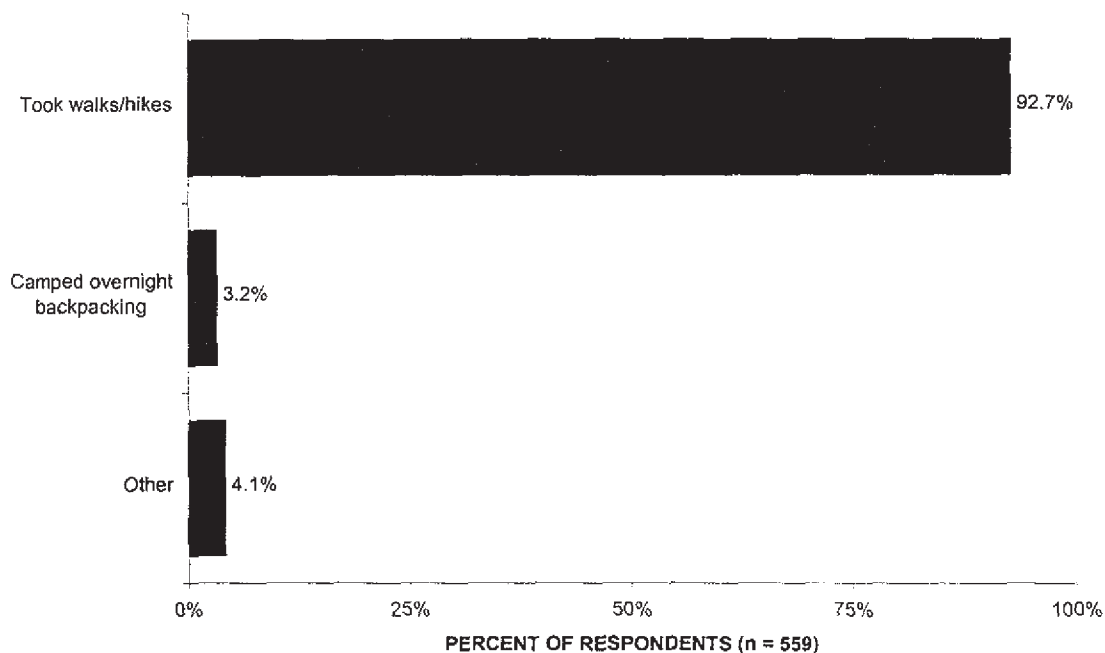
Taking walks or hikes was listed by 92.7% of wilderness trail respondents as the most important way of moving through and experiencing the park (see Figure 4.23)¹⁶. The second most important way of experiencing MORA depended on contact point, $\chi^2(9) = 21.22, p = .012$ (see Figure 4.24). Figure 4.24 shows that a larger proportion of respondents to Mount Fremont (75.7%) and Comet Falls (77.0%) listed driving around

¹⁶ These data include respondents who moved through and experienced MORA in multiple ways (95.1% of respondents) and those respondents who moved through and experienced MORA in a single way (4.9%, n = 81). Of those respondents who moved through and experienced MORA in a single way, all but one (98.8%) indicated that they took walks or hikes.

IV. Trip Characteristics

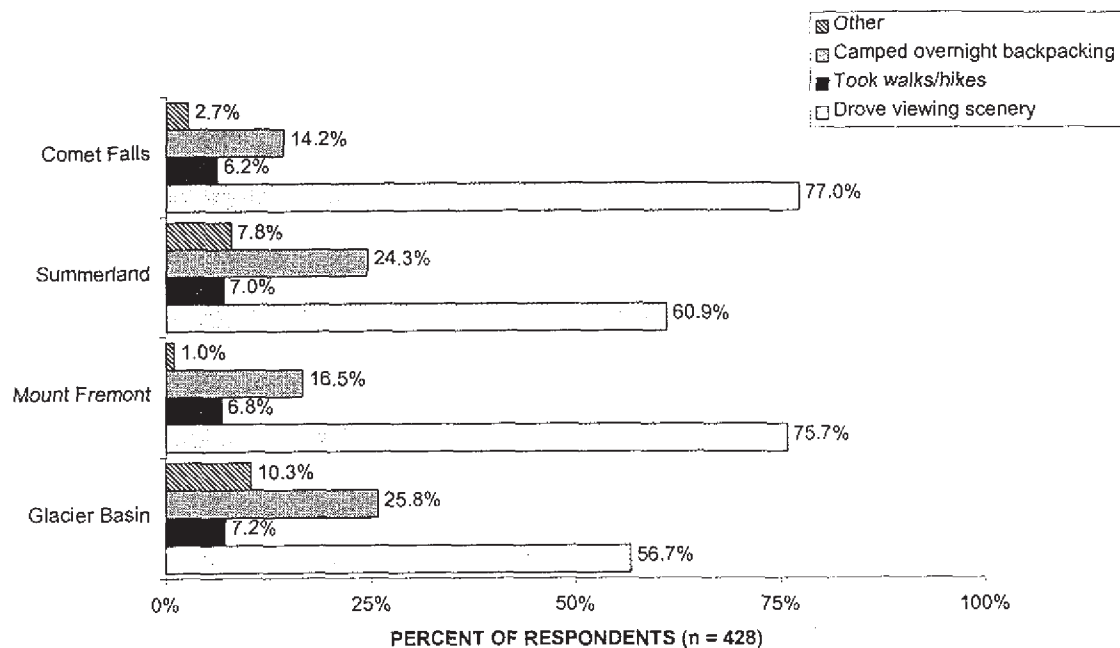
viewing scenery than respondents at Summerland (60.9%) or Glacier Basin (56.7%) as their second most important way of moving through and experiencing MORA. This finding reflects that the drive to Mount Fremont is the most scenic drive to a trailhead of the four trails, and that respondents contacted at Comet Falls focused on a more diverse park experience. Figure 4.24 also shows a larger proportion of respondents to Summerland (24.3%) and Glacier Basin (25.8%) listed camping overnight while backpacking than did respondents at Mount Fremont (16.5%) and Comet Falls (14.2%). This finding is consistent with the increased opportunities for camping while backpacking at Summerland and Glacier Basin compared to Mount Fremont and Comet Falls.

FIGURE 4.23: Q-5a
THE MOST IMPORTANT WAY OF MOVING THROUGH AND EXPERIENCING MORA



IV. Trip Characteristics

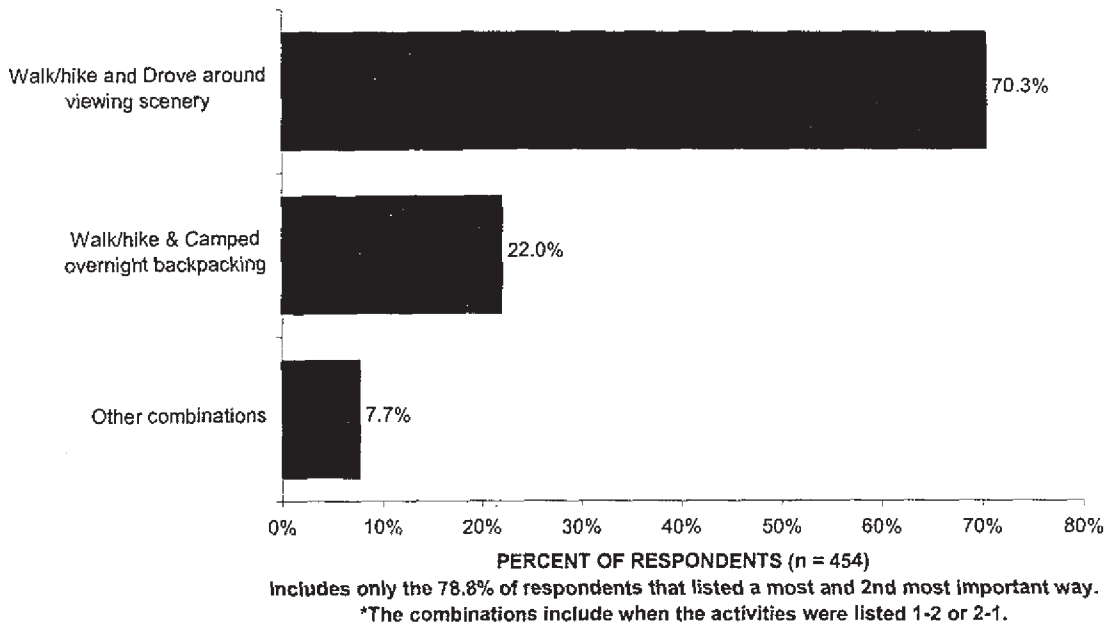
FIGURE 4.24: Q-5a
2nd MOST IMPORTANT WAY OF MOVING AND EXPERIENCING MORA



Combinations of most and second most important ways of moving through MORA were examined. Figure 4.25 shows that 70.3% of respondents listed walked/hiked and drove around viewing scenery as their two most important ways of moving through MORA. The next most common combination (22.0%) was walked/hiked and camped overnight while backpacking.

IV. Trip Characteristics

FIGURE 4.25: Q-5d
COMBINATIONS OF MOST AND SECOND MOST IMPORTANT
WAY OF MOVING THROUGH MORA*



Outdoor activities. Figure 4.26 indicates that most respondents engaged in viewing wildflowers (89.0%), viewing wildlife (80.6%), taking photos (79.6%), and picnicking (65.2%). The effect of day of week contacted and contact point was investigated for each outdoor activity and effects were found for viewing wildlife, picnicking, snow play, and other¹⁷.

¹⁷ The proportion of respondents engaging in other activities (i.e., activities not specifically listed) did not vary by day of week contacted for Mount Fremont or Glacier Basin, p 's > .38. However, more respondents contacted on the weekend than on a weekday engaged in other activities at Comet Falls (25.2% vs. 10.3%), $\chi^2(1) = 7.11$, $p = .008$, and more respondents contacted on a weekday than the weekend engaged in other activities at Summerland (20.2% vs. 6.4%), $\chi^2(1) = 7.16$, $p = .007$.

IV. Trip Characteristics

FIGURE 4.26: Q-5b
OUTDOOR ACTIVITIES IN WHICH YOUR PARTY PARTICIPATED

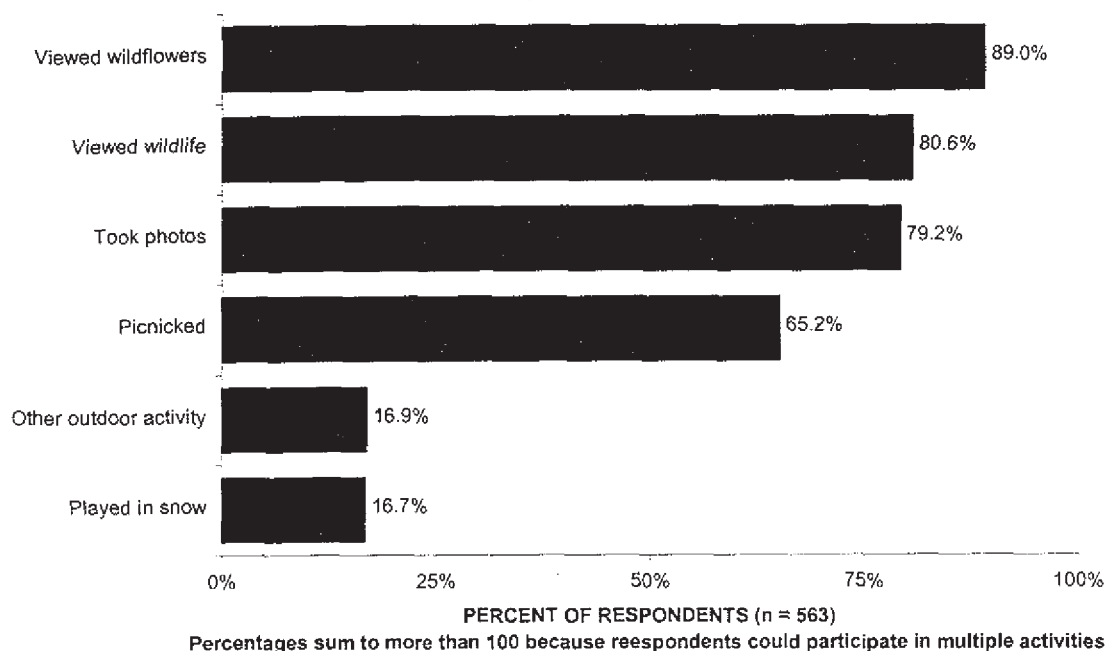
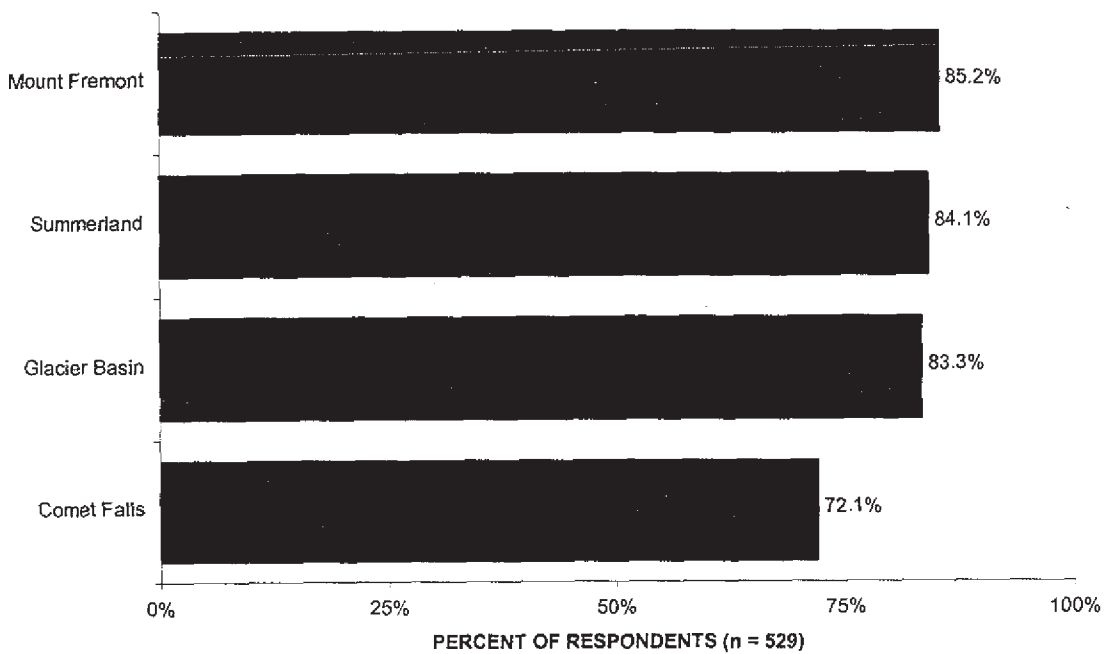


Figure 4.27 shows that a significantly smaller proportion of respondents to Comet Falls viewed wildlife than at the other three contact points (72.1% vs. 85.1%, 84.1%, and 83.3%), $\chi^2 (3) = 9.90, p = .019$. Comet Falls' terrain is more wooded than the other trails surveyed making the actual spotting of wildlife more difficult.

IV. Trip Characteristics

FIGURE 4.27: Q-5b
PROPORTION OF RESPONDENTS VIEWING WILDLIFE BY CONTACT POINT

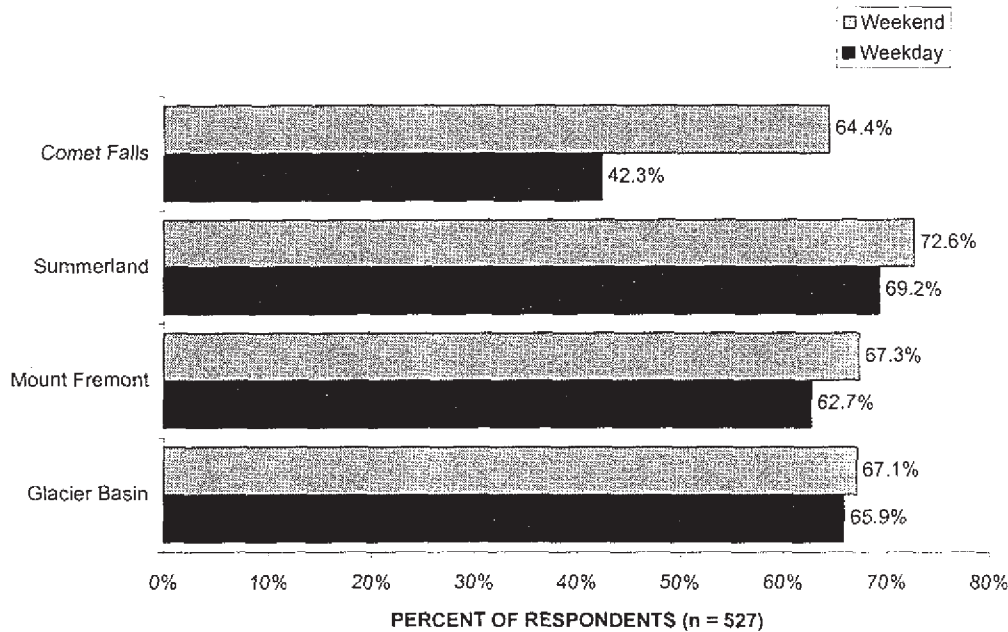


A larger proportion of respondents contacted on the weekend (68.5%) picnicked than respondents contacted on a weekday (59.3%), $\chi^2 (1) = 4.71, p = .030$. Because these day of week contacted effects were not due to respondents' place of residence, it suggests that picnics are more likely to be a weekend than weekday activity. The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses examining contact point effects. Figure 4.28 shows that respondents to Comet Falls were more likely to picnic on the weekend (64.4%) than the weekday (42.3%), $\chi^2 (1) = 9.48, p = .002$, while respondents were equally likely to picnic regardless of day of week at the other contact points, all p 's $> .53$. Overall, fewer people picnicked at Comet Falls (regardless of day) than at the other contact points (51.5% vs. 71.4%, 63.8%, and 66.5%), $\chi^2 (3) = 18.21, p <$

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.001. These findings at Comet Falls are consistent with the findings that a relatively large proportion of Comet Falls respondents did not have specific destinations and that such respondents were particularly common on weekdays. Also, respondents contacted at Comet Falls hiked the shortest distance and spent the least amount of time on the trail of all the contact points. The average number of hours spent hiking was 3.9 which means that many respondents could easily hike without the need picnic.

FIGURE 4.28: Q-5b
PROPORTION OF RESPONDENTS WHO PICNICKED

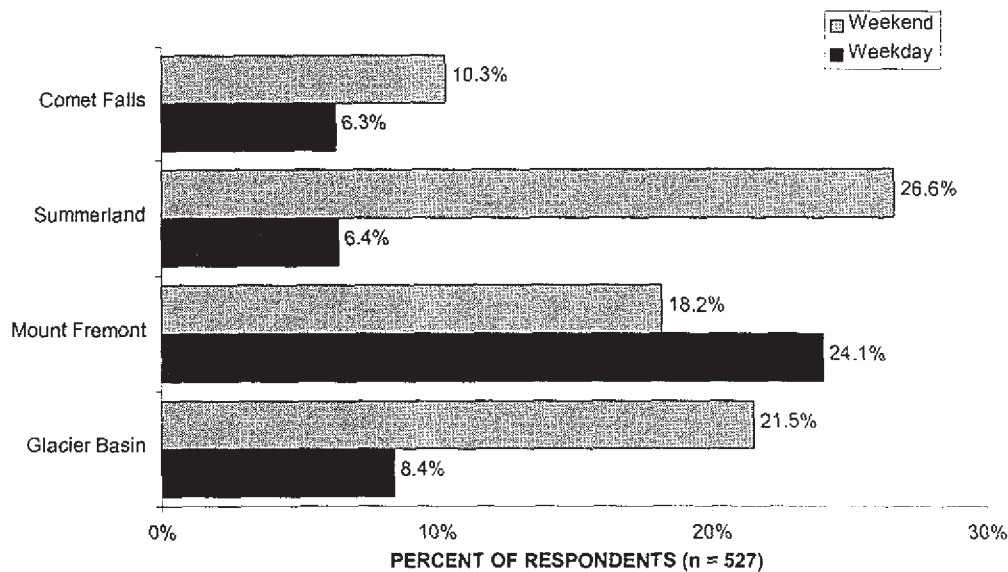


A larger proportion of respondents contacted on the weekend (19.6%) played in the snow than did respondents contacted on a weekday (12.1%), $\chi^2 (1) = 5.15, p = .023$. The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses to examine contact point effects. The effect of day of week contacted varied by contact point (see

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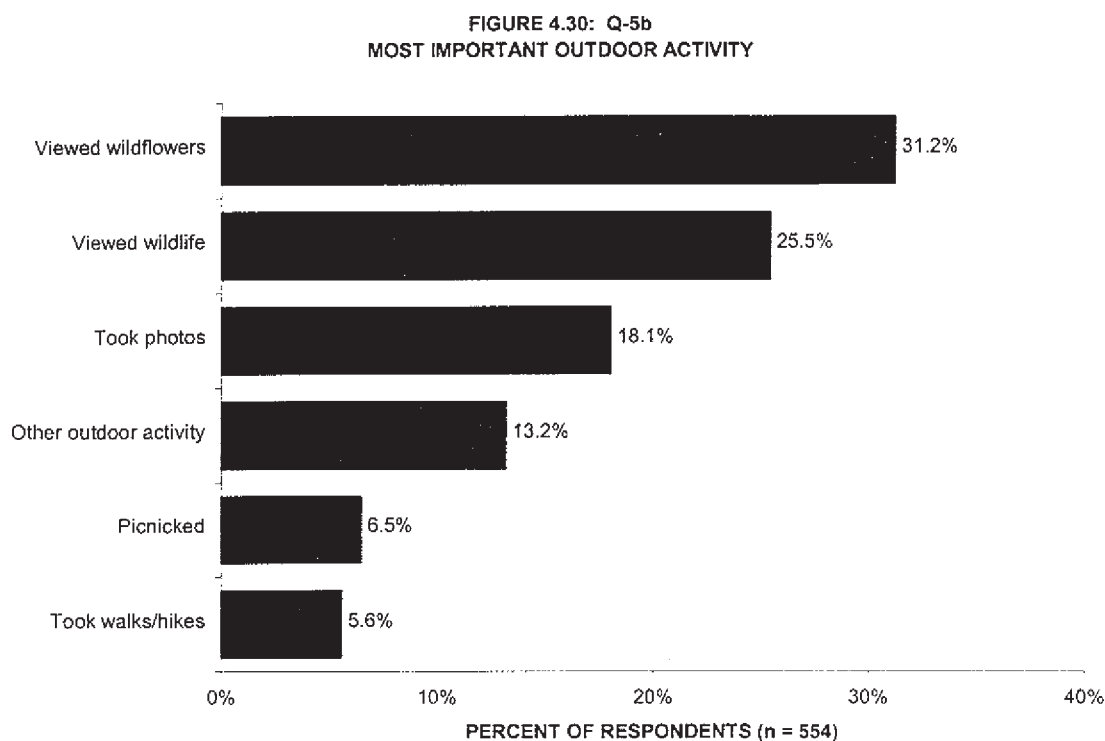
Figure 4.29). Specifically, more respondents contacted on the weekend than the weekday played in the snow at Summerland and Glacier Basin (26.6% vs. 6.4%, $\chi^2 (1) = 12.80$, $p < .001$; 21.5% vs. 8.4%, $\chi^2 (1) = 5.49$, $p = .019$, respectively). There were no significant differences in snowplay by day of week contacted for either Mount Fremont or Comet Falls. Overall, significantly fewer respondents engaged in snowplay at Comet Falls than at the other three contact points (8.0% vs. 22.5%, 14.8%, or 18.8%), $\chi^2 (3) = 17.43$, $p = .001$. This finding is consistent with fact that there is less likely to be snow at Comet Falls, given its lower altitude than at the other contact points.

FIGURE 4.29: Q-5b
PROPORTION OF RESPONDENTS WHO PLAYED IN THE SNOW



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Figure 4.30 shows that for 31.2% of respondents, viewing wildflowers was the most important outdoor activity¹⁸. Viewing wildlife was the most important outdoor activity for 25.5% of respondents and taking photos was the most important outdoor activity for 18.1% of respondents.

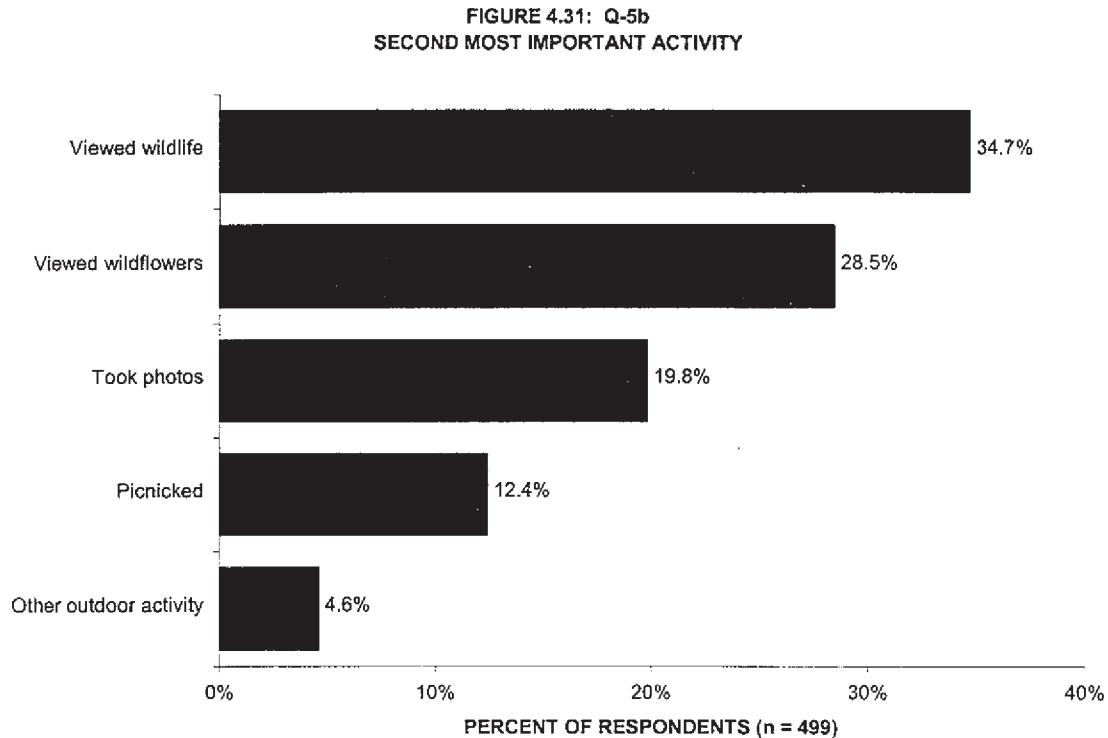


Respondents also indicated their second most important outdoor activity. Figure 4.31 shows that for 34.7% of respondents viewing wildlife was the second most important outdoor activity. Viewing wildflowers was the second most important outdoor activity for

¹⁸ These data include respondents who engaged in multiple outdoor activities (95.1% of respondents, n = 527) and respondents who engaged in a single outdoor activity (4.9%, n = 27). Of those respondents who engaged in a single outdoor activity, the most common activity was taking photos (52.4%) followed by picnicking (19.0%) and viewing wildflowers (14.3%).

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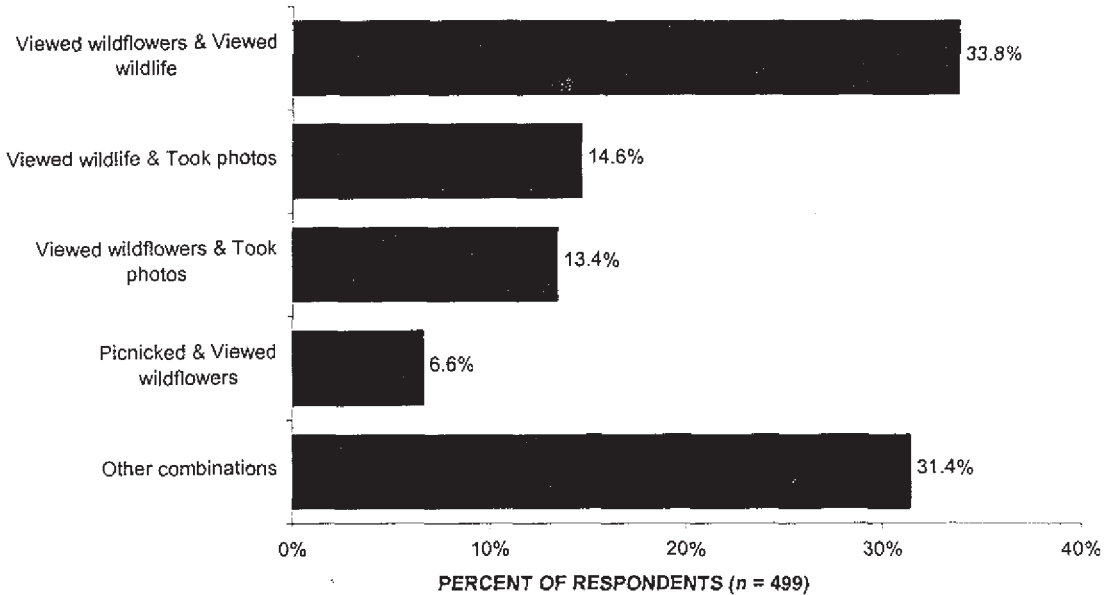
28.5% of respondents and taking photos was the second most important outdoor activity for 19.8% of respondents.



Combinations of most and second most important outdoor activity were examined. Figure 4.32 shows that one third of respondents' two most important outdoor activities was viewing wildflowers and viewing wildlife. The next two most common combinations of important outdoor activities involved taking photos of either wildlife (14.6%) or wildflowers (13.4%).

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FIGURE 4.32: Q-5b
COMBINATIONS OF MOST AND SECOND MOST IMPORTANT OUTDOOR ACTIVITY

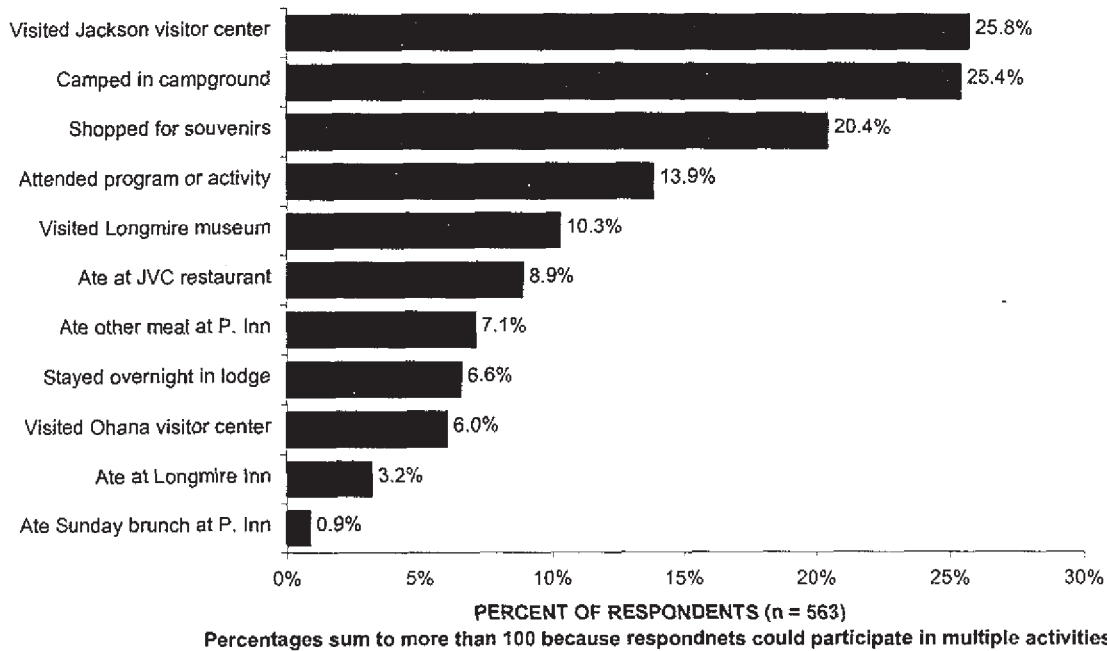


Included only the 86.6% of respondents who listed a most and second most important outdoor activity.
*The combinations include when the activities were listed 1-2 or 2-1.

Park facilities activities. As seen in Figure 4.33, the most frequent park activities engaged in were going to Jackson Visitor Center (25.8%), camping overnight in a campground (25.4%), shopping for souvenirs (20.4%), and attending a park service naturalist program or activity (13.9%).

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FIGURE 4.33: Q-5c
PARK ACTIVITIES IN WHICH RESPONDENTS PARTICIPATED



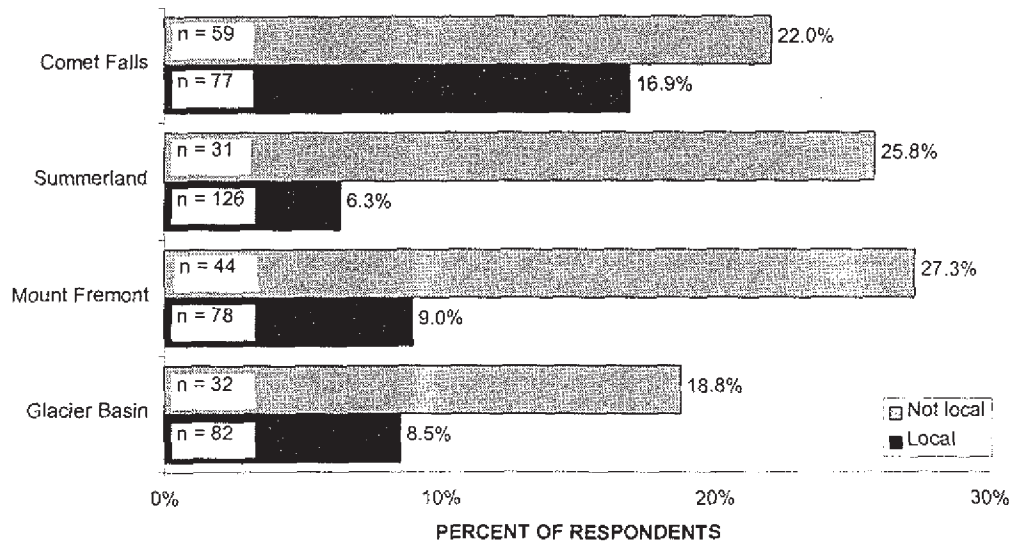
The effect of day of week contacted and contact point were examined for each park activity. Significant effects were observed for staying overnight within the park, eating lunch or a snack at Jackson Visitor Center (fast food), eating a sit-down meal at Paradise Inn other than Sunday brunch, and eating a sit down meal at Longmire Inn, but are not reported because the number of respondents engaging in these activities was less than 10% of all respondents. Significant effects for activities engaged in by 10% or more are described below.

The proportion of respondents who attended a park service naturalist program or activity varied by day of week contacted, $\chi^2(1) = 5.53, p = .019$. Further analyses indicated that this effect was being driven primarily by differences in respondents' residence. Specifically, nonlocal respondents were more likely to attend a park service

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naturalist program or activity than local respondents (23% vs. 9.9%), $\chi^2 (1) = 17.07$, $p < .001$. The effect of residence also varied by contact point. As can be seen in Figure 4.34, more nonlocal than local respondents contacted at Summerland and Mount Fremont attended a program, $\chi^2 (1) = 10.29$, $p = .001$ and $\chi^2 (1) = 7.16$, $p = .007$, respectively. The differences in nonlocal and local respondents contacted at Glacier Basin and Comet Falls did not differ significantly, $\chi^2 (1) = 2.38$, $p = .123$ and $\chi^2 (1) = .57$, $p = .449$, respectively.

FIGURE 4.34: Q-5a
PROPORTION OF RESPONDENTS WHO ATTENDED A PROGRAM OR ACTIVITY

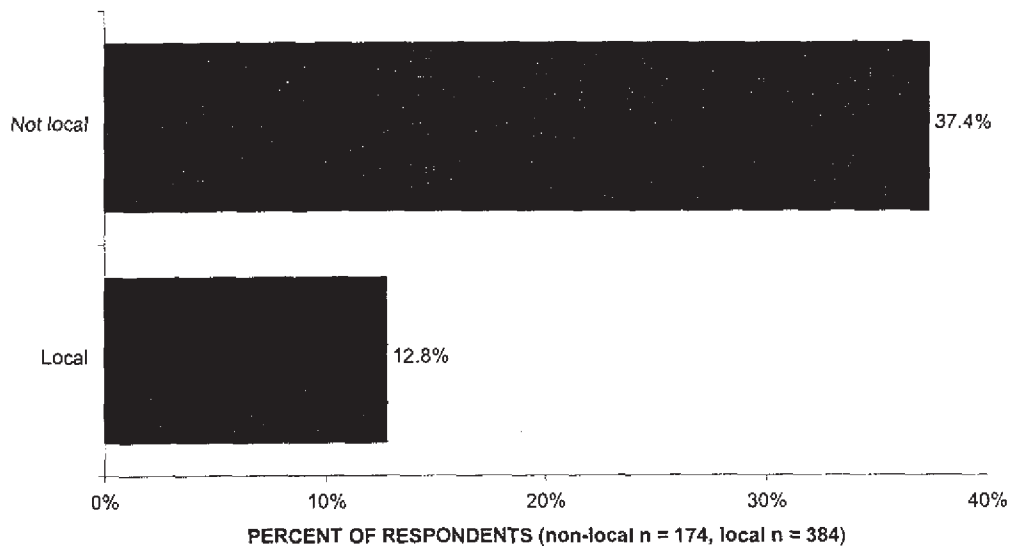


Shopping for souvenirs was a more popular activity for respondents contacted on weekdays than on the weekend (25.6% vs. 17.6%), $\chi^2 (1) = 5.01$, $p = .025$. Further analyses indicated that this effect was due to differences in respondents' residence. As

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seen in Figure 4.35, a greater proportion of nonlocal than local respondents shopped for souvenirs (37.4% vs. 12.8%), $\chi^2 (1) = 44.56$, $p < .001$.

FIGURE 4.35: Q-5c
PROPORTION OF RESPONDENTS WHO SHOPPED FOR CURIOS OR SOUVENIRS

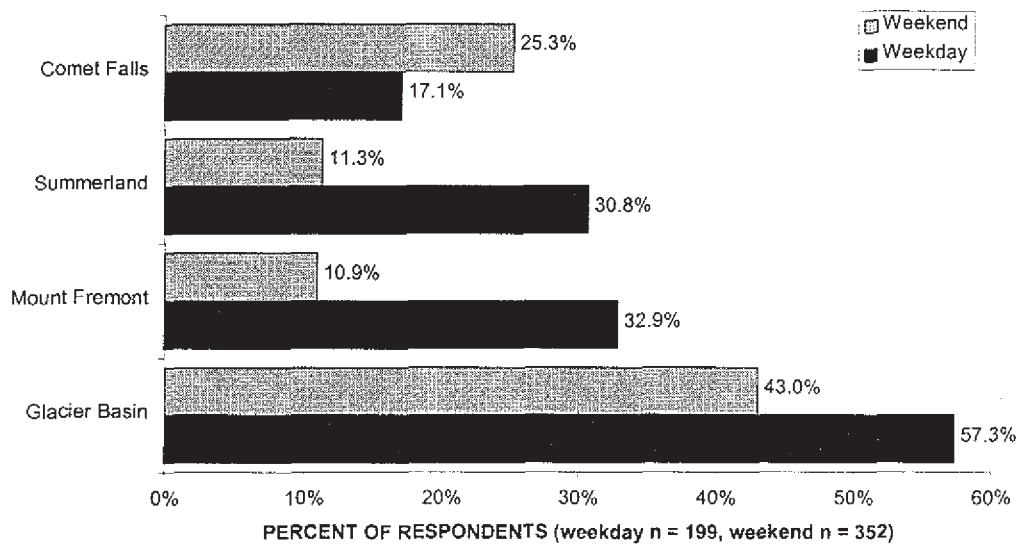


Respondents contacted on weekdays were more likely to camp overnight in a campground than respondents contacted on the weekend (31.7% vs. 21.6%), $\chi^2 (1) = 6.83$, $p = .009$. The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses examining contact point effects. The effect of day of week contacted depended on contact point (see Figure 4.36). At Mount Fremont, a larger proportion of respondents contacted on weekdays camped overnight in a campground than those contacted on the weekend (32.9% vs. 10.9%), $\chi^2 (1) = 9.97$, $p = .002$. Respondents contacted on

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weekdays at Summerland were more likely to have camped overnight than those contacted on the weekend (30.8% vs. 11.2%), $\chi^2 (1) = 11.90, p = .001$. There was no effect of day of week contacted on camping overnight at Glacier Basin or at Comet Falls, p 's $> .07$. Overall, more respondents contacted at Glacier Basin camped overnight than respondents contacted at the other three points (50.3% vs. 27.2%, 18.8%, or 21.0%), $\chi^2 (3) = 52.86, p < .001$.

FIGURE 4.36: Q-5c
PROPORTION OF RESPONDENTS WHO CAMPED OVERNIGHT IN A CAMPGROUND*



More respondents contacted on a weekday went to Jackson Visitor Center than respondents contacted on a weekend day (34.7% vs. 20.5%), $\chi^2 (1) = 13.50, p < .001$. Further analyses indicated that day of week contacted effects depended on respondents' residence (see Figure 4.37). The proportion of local respondents who visited Jackson

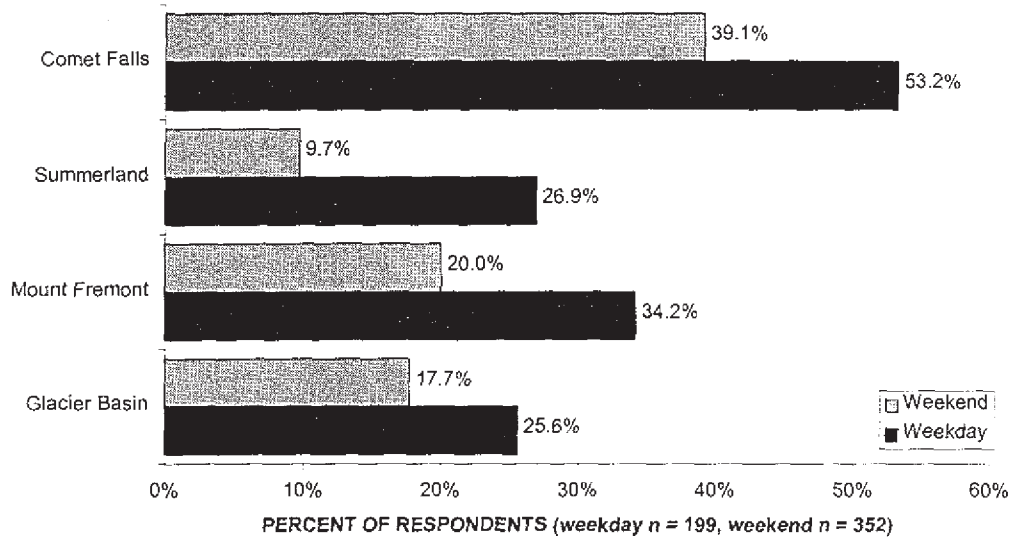
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Visitor Center did not differ by day of week contacted (weekday: 14.9% vs. weekend: 12.5%), $\chi^2 (1) = .40$, $p < .525$. In contrast, the proportion of nonlocal respondents who visited Jackson Visitor Center was greater for those contacted on the weekday (61.2%) than those contacted on the weekend (44.3%), $\chi^2 (1) = 4.93$, $p < .026$. The effect of respondents' residence did not vary by contact point and, therefore, is not discussed further.

The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used to examine contact point effects. The effect of day of week contacted varied by contact point. The strongest effect of day of week occurred at Summerland with 26.6% of respondents contacted on the weekday going to Jackson Visitor Center, but only 9.7% of respondents contacted on the weekend going, $\chi^2 (1) = 10.42$, $p = .001$. Mount Fremont and Comet Falls had weaker effects in the same direction (34.2% vs. 20.0%, $\chi^2 (1) = 3.87$, $p = .049$; 53.2% vs. 39.1%, $\chi^2 (1) = 3.88$, $p = .049$, respectively) and there was no effect of day of week contacted at Glacier Basin, $\chi^2 (1) = 1.47$, $p = .225$. Across all days of the week, the proportion of respondents who went to Jackson Visitor Center varied by contact point, $\chi^2 (3) = 51.28$, $p < .001$. The proportion of respondents contacted at Comet Falls (47.0%) that went to Jackson Visitor Center was significantly greater than the proportion of respondents contacted at Mount Fremont (30.5%) or Glacier Basin (21.7%). Also, the proportion of respondents contacted at Summerland (16.7%) that went to Jackson Visitor Center was significantly less than at Mount Fremont or Glacier Basin.

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FIGURE 4.37: Q-5c
PROPORTION OF RESPONDENTS THAT WENT TO JACKSON VISITOR CENTER



More respondents contacted on weekdays went to Longmire Museum than respondents contacted on the weekend (15.1% vs. 7.7%), $\chi^2(1) = 7.52, p = .006$. Further analyses indicated that day of week contacted effects depended on respondents' residence. A greater proportion of local respondents contacted on weekdays visited the Longmire Museum than local respondents contacted on the weekend (23.5% vs. 19.3%), $\chi^2(1) = 3.95, p = .047$. For nonlocal respondents, however, there were no day of week contacted effects, (weekday: 8.8% vs. weekend: 3.8%), $\chi^2(1) = .46, p = .499$. The effects of respondents' residence did not vary by contact point and therefore, are not discussed further.

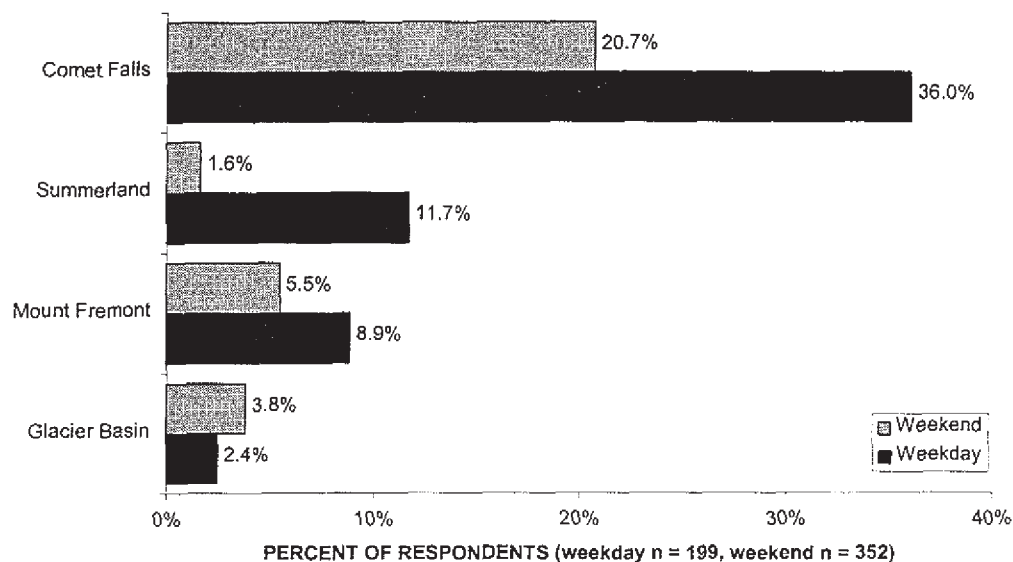
The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses.

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The effect of day of week contacted, however, varied by contact point. Day of week contacted had no effect at Glacier Basin or at Mount Fremont, p 's > .420. Figure 4.38 shows that the proportion of respondents who went to Longmire was greater for those contacted on weekdays than those contacted on the weekend at Summerland (11.7% vs. 1.6%), $\chi^2 (1) = 9.32$, $p = .002$, and at Comet Falls (36.0% vs. 20.7%), $\chi^2 (1) = 5.55$, $p = .019$. These effects are consistent with those found for respondents going to Jackson Visitor Center. Overall, a larger proportion of respondents to Comet Falls went to Longmire Museum than respondents contacted at the other three contact points (29.0% vs. 8.0%, 5.5%, or 3.1%), $\chi^2 (3) = 1.47$, $p < .001$. This finding is consistent with the proximity of Longmire to Comet Falls (e.g., same side of the park) compared to the other three contact points.

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FIGURE 4.38: Q-5c
PROPORTION OF RESPONDENTS THAT WENT TO LONGMIRE MUSEUM



Together these findings suggest that respondents contacted on the weekend differ from respondents contacted on weekdays in the different types of park facilities activities they engage in. As noted earlier, respondents contacted on weekends were more likely on a day visit and respondents contacted on weekdays were more likely to be spending multiple days at MORA. Thus, it may be that observed day of week contacted differences in park facilities activities can be explained by whether respondents were on a day trip or a multiple day trip. Analyses performed to test this hypothesis for each of the different types of park facilities described above revealed that a large part of the observed differences in day of week contacted can be explained by whether visitors spent one day or multiple days in MORA. It should be noted that for some of the variables, not all of the differences observed for day of week contacted could be explained by whether

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respondents spent one day or multiple days at MORA. If further detail about these effects is of interest, more detailed analyses can be performed.

Figures 4.39 - 4.42 show that respondents¹⁹ most important park activity varied by contact point, $\chi^2 (27) = 58.02, p < .001$ [chi-square has frequencies < 5]. For respondents contacted at Glacier Basin, camping overnight in a campground was the most important facility activity for 82.8% of respondents. Camping overnight in a campground had the largest proportion of respondents indicating it as the most important facility activity at the other three contact points, but the proportions were considerably less than at Glacier Basin (41.1%, 30.7%, and 36.7%). White River Campground was the most common place to camp for respondents contacted at Glacier Basin, Summerland, and Mount Fremont (88.9%, 90.5%, and 64.3%, respectively). The majority of respondents contacted at Comet Falls camped at Cougar Rock Campground (82.8%). This pattern reflects the geographical proximity between campground and trailhead. Visiting Jackson Visitor Center was indicated to be the most important facility activity by 25.0% of respondents contacted at Summerland, 29.5% of respondents contacted at Comet Falls, and 18.3% of respondents contacted at Mount Fremont.

¹⁹ These data included respondents who experienced multiple park facilities (64.1%) and those who experienced a single park facility (35.9%, $n = 94$). Of those respondents who experienced a single park facility, the most common experience was camping in a campground (45.3%) followed by visiting Jackson Visitor Center (23.6%) and shopping for souvenirs (16.0%).

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FIGURE 4.39: Q-5c
GLACIER BASIN RESPONDENTS' MOST IMPORTANT FACILITY ACTIVITY

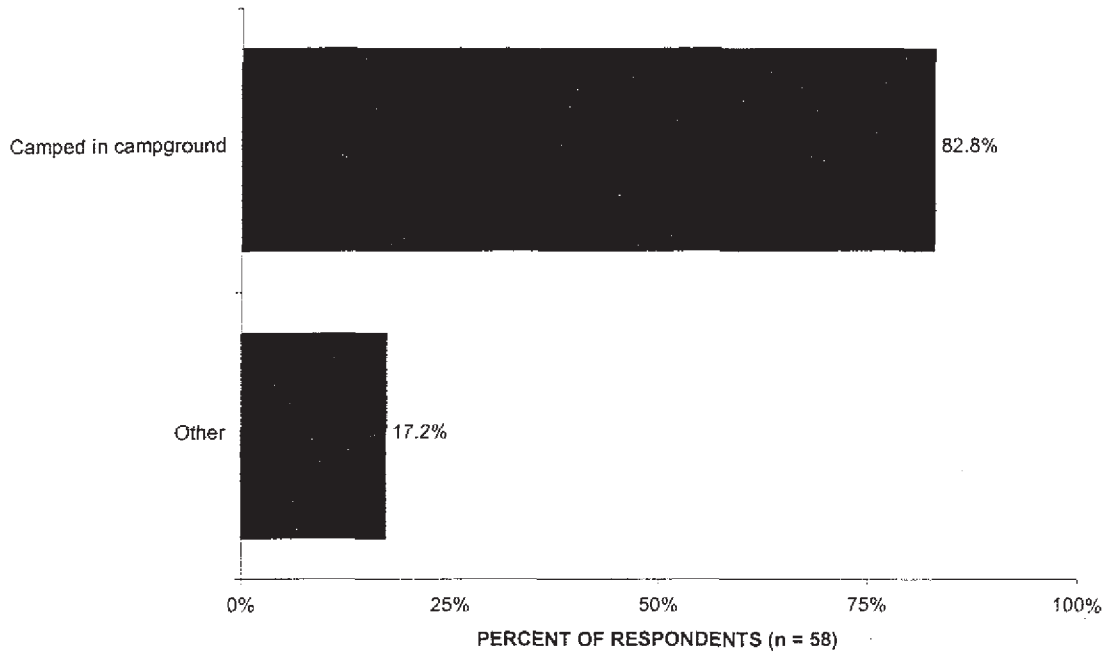
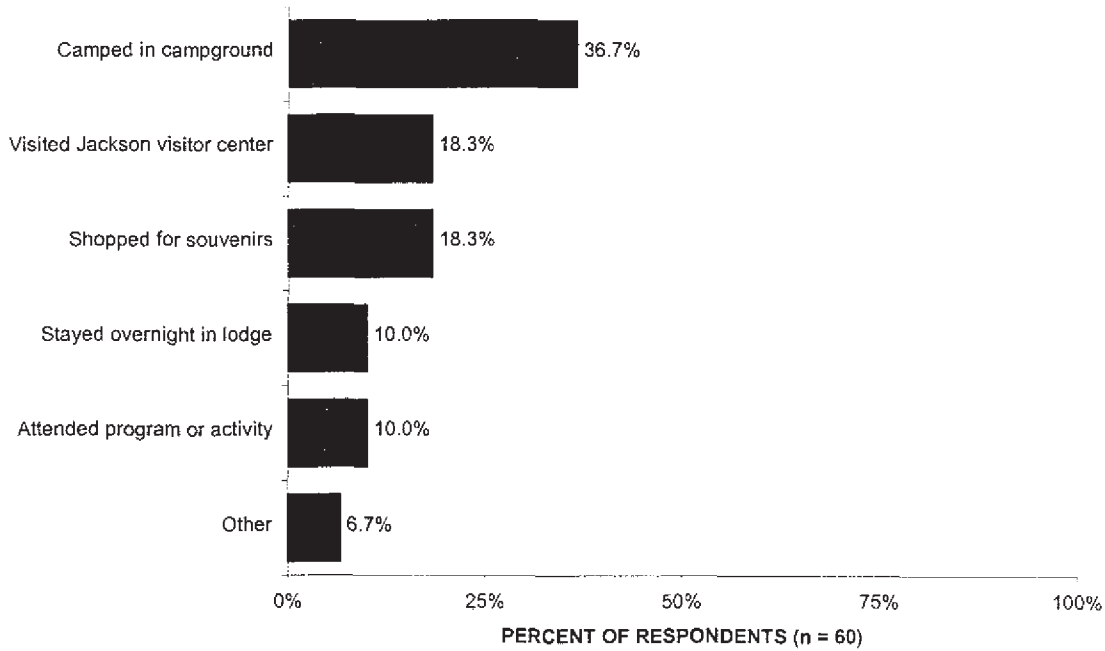


FIGURE 4.40: Q-5c
MOUNT FREMONT RESPONDENTS' MOST IMPORTANT FACILITY ACTIVITY



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FIGURE 4.41: Q-5c
SUMMERLAND RESPONDENTS' MOST IMPORTANT FACILITY ACTIVITY

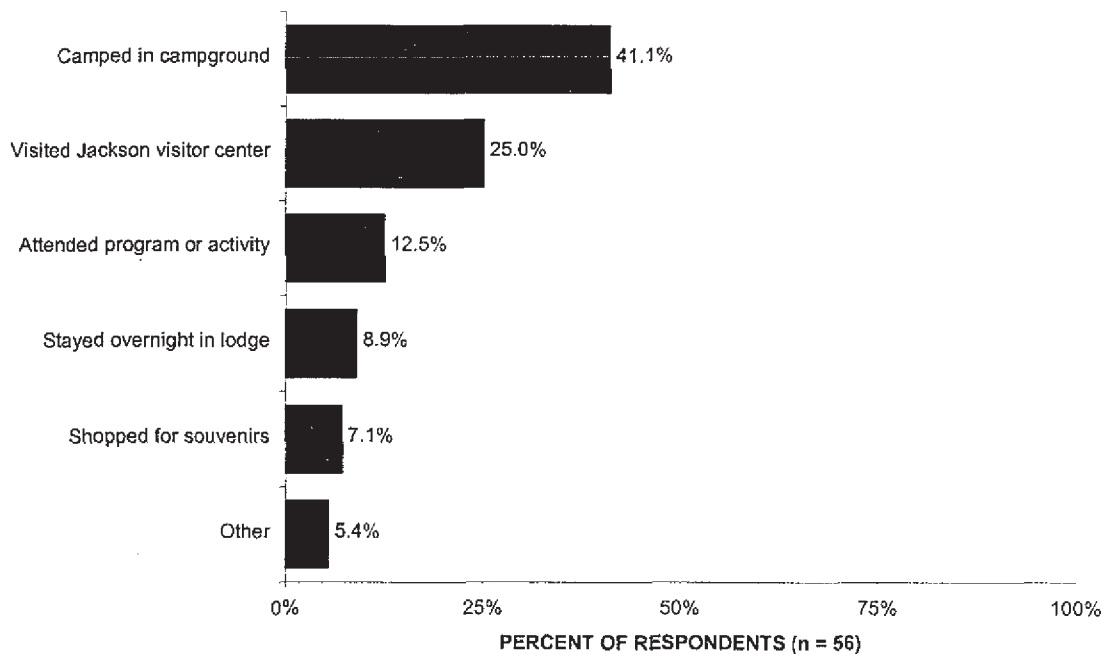
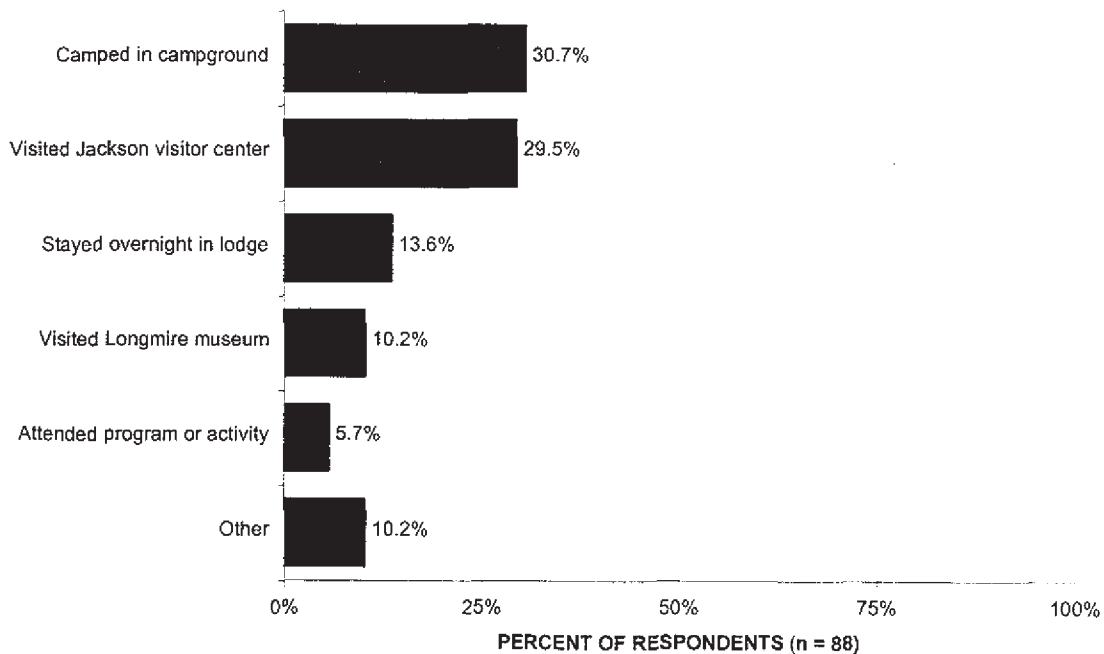
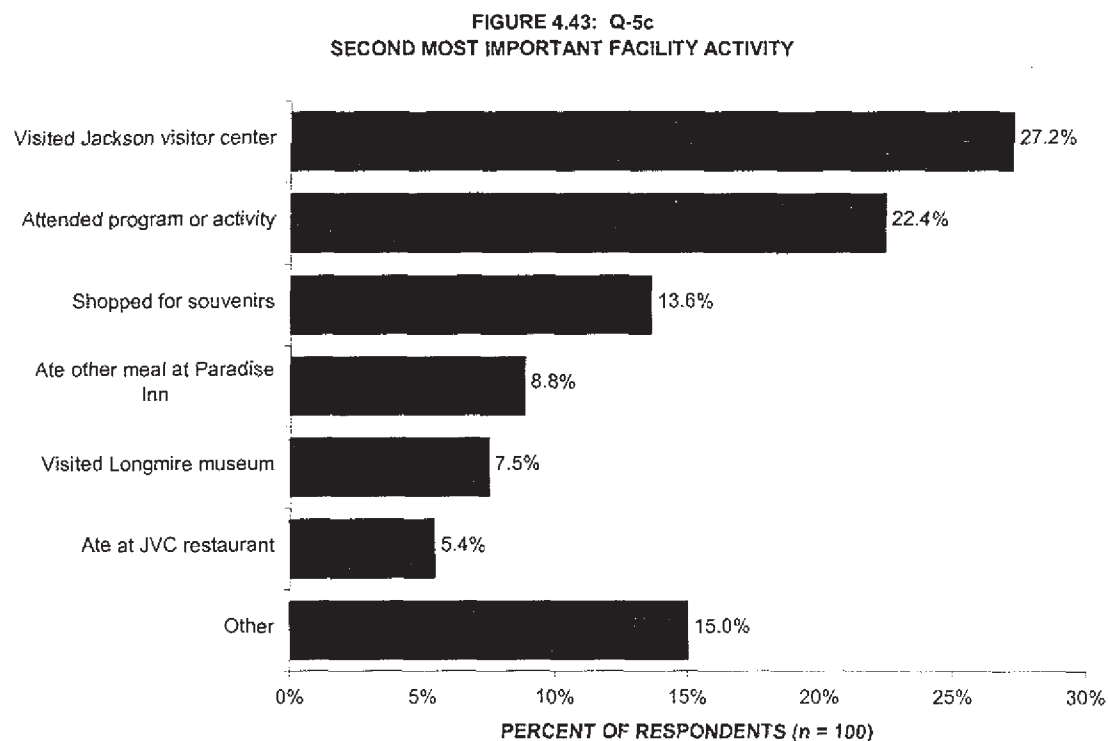


FIGURE 4.42: Q-5c
COMET FALLS RESPONDENTS' MOST IMPORTANT FACILITY ACTIVITY



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Respondents also indicated their second most important facility activity. Visiting Jackson Visitor Center was the second most important facility activity for 27.2% of respondents while attending a park service naturalist program or activity was the second most important activity for 22.4% of respondents (see Figure 4.43).

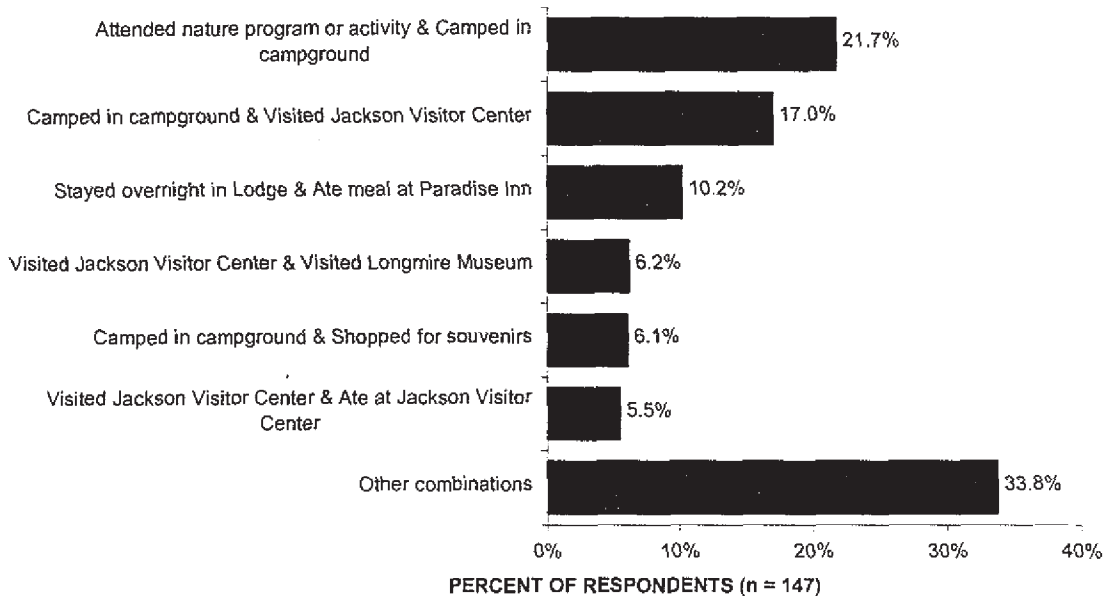


Combinations of most and second most important park facilities activities were examined. As shown in Figure 4.44, the most common (21.7% of respondents) combination of important park facilities activities was attending a nature program or activity and camping overnight in campground followed by the combination camping overnight in campground and visiting Jackson Visitor Center (17.0% of respondents). It should be noted that fewer respondents listed a second most important park facility than

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for other ways of experiencing MORA suggesting that park facilities were less central to their trip.

FIGURE 4.44: Q-5c
COMBINATIONS OF MOST AND SECOND MOST IMPORTANT PARK FACILITIES ACTIVITIES*



PERCENT OF RESPONDENTS (n = 147)
Includes only the 25.5% of respondents that listed a most and second most important facility activity
*The combinations include when the activities were listed 1-2 or 2-1.

Overall most important activity. Respondents indicated their top three most important activities across the three types previously discussed. For 79.3% of respondents the most important activity overall was taking walks or hikes (see Figure 4.45).

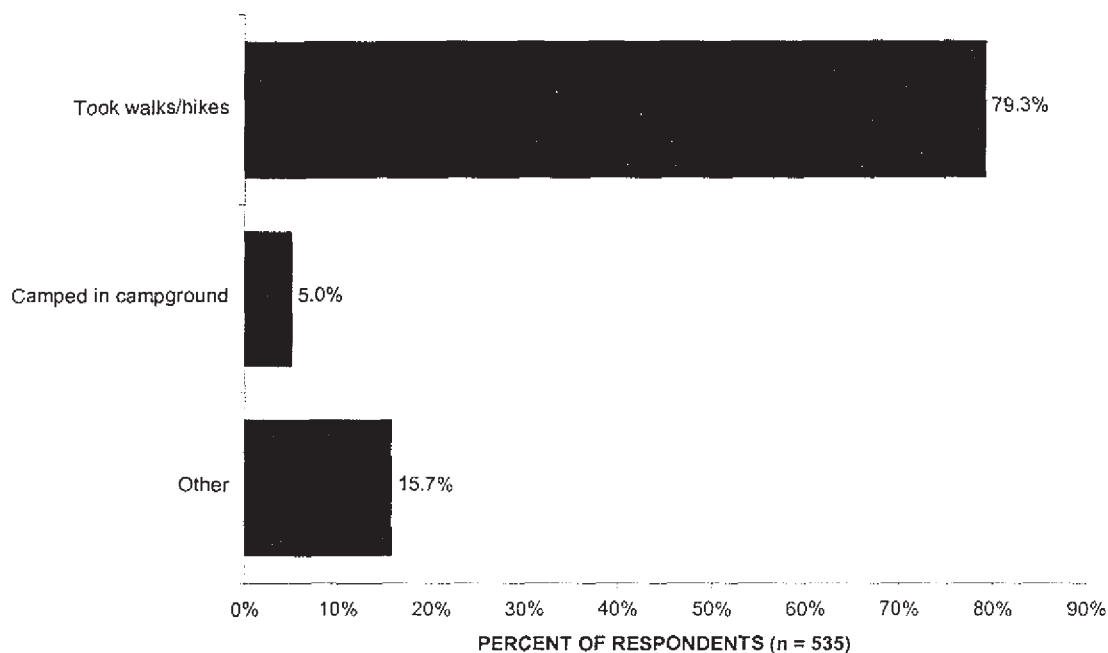
Figure 4.46 reveals that respondents were in less agreement as to the second most important activity overall. Viewing wildflowers was listed by the largest proportion of respondents (19.9%) as their second most important activity overall. Other second most important activities overall indicated were driving around viewing scenery (13.7%),

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viewing wildlife (13.5%), camping in campground (10.4%), and taking walks/hikes (10.3%).

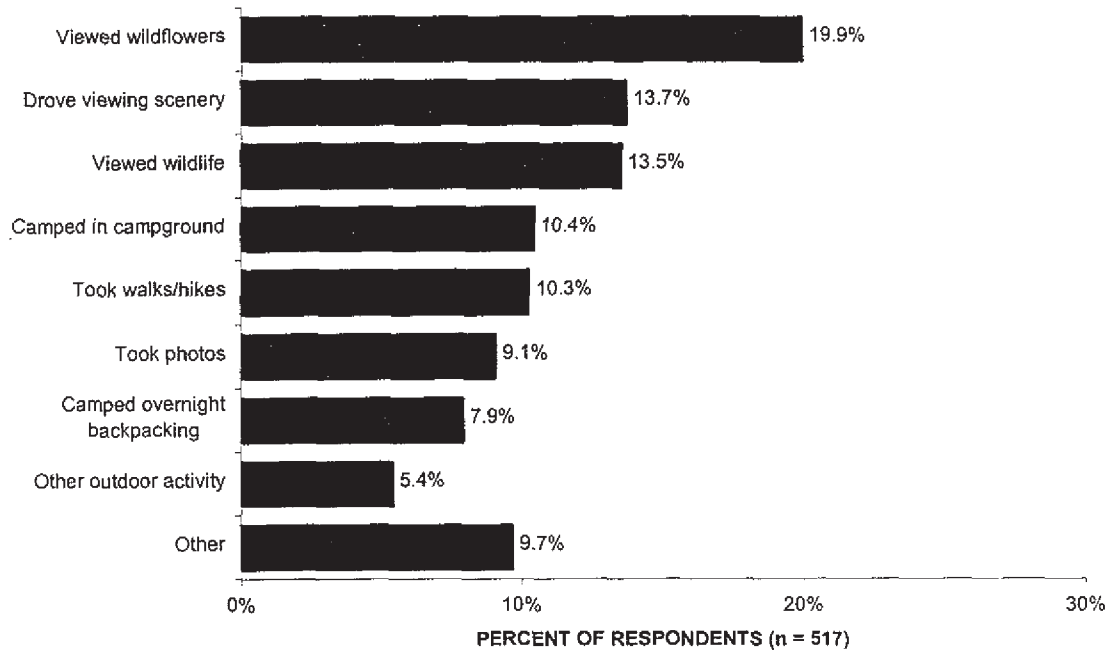
For 22.1% of respondents viewing wildlife was the third most important activity overall while viewing wildflowers was the third most important activity overall for 21.7% of respondents (see Figure 4.47).

FIGURE 4.45: Q-5d
MOST IMPORTANT ACTIVITY OR WAY OF EXPERIENCING MORA



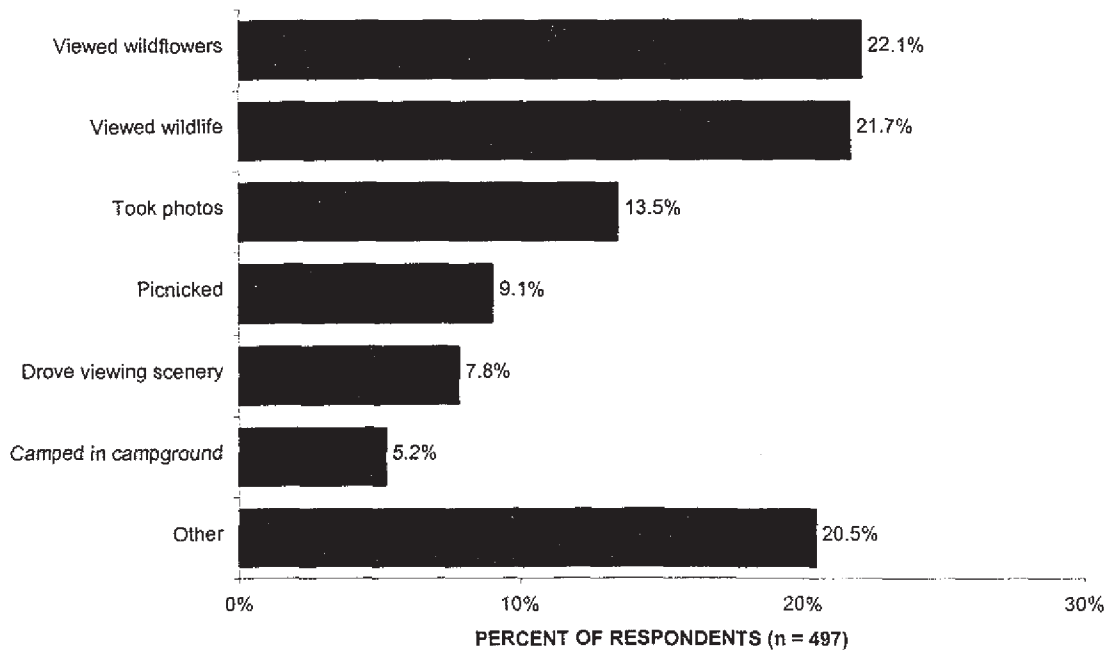
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FIGURE 4.46: Q-5d
SECOND MOST IMPORTANT ACTIVITY OR WAY OF EXPERIENCING MORA*



*A total of 10.2% (59/576) of respondents did not respond to this question.

FIGURE 4.47: Q-5d
THIRD MOST IMPORTANT ACTIVITY OR WAY OF EXPERIENCING MORA*

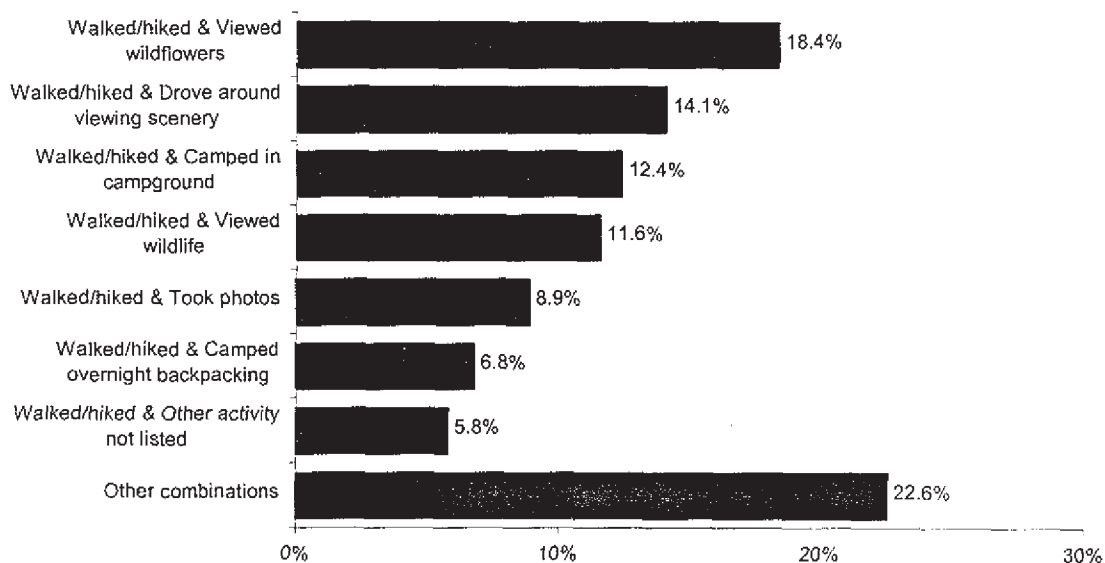


*A total of 13.7% (79/576) of respondents did not respond to this question.

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Combinations of most and second most important overall activities were examined. Not surprising, all the most frequently listed combinations included taking walks/hikes as an important overall activity. As seen in Figure 4.48, the second activity in three of the most frequently listed pairs of activities involved viewing the natural scenery (viewing wildflowers (18.4%), drove around viewing scenery (14.1%), and viewed wildlife (11.6%)). Camping either in a campground (12.4%) or while backpacking (6.8%) was the other most important activity for almost 20% of the respondents.

FIGURE 4.48: Q-5d
COMBINATIONS OF MOST AND SECOND MOST IMPORTANT OVERALL ACTIVITY



PERCENT OF RESPONDENTS (n = 517)
Includes the 89.8% of respondents who listed a most and second most important activity
*The combinations include when the activities were listed 1-2 or 2-1.

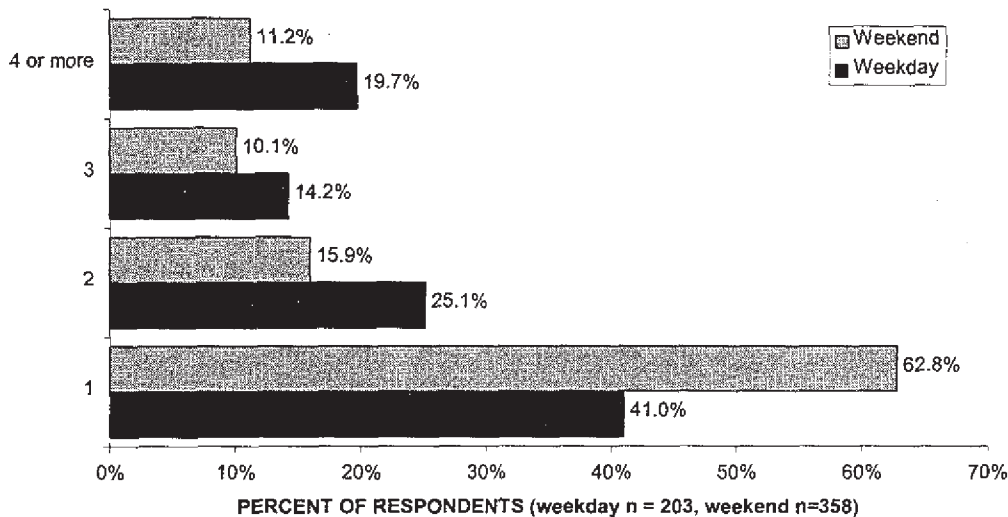
Walks and Hikes

Number of walks/hikes. The number of walks/hikes that respondents took depended on day of week contacted, $F(1, 557) = 7.12, p = .008$. Respondents contacted

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on weekdays took more walks ($M=2.66$) than respondents contacted on the weekend ($M=1.89$). Additional analyses indicated that respondents' residence had a significant, but independent effect from day of week contacted. Nonlocal respondents took more hikes than local hikers ($M_s = 3.19$ vs. 1.70 , respectively), $F(1, 557) = 47.38$, $p < .001$. The effects of respondents' residence did not vary by contact point and, thus, are not discussed further.

FIGURE 4.49: Q-6
NUMBER OF WALKS/HIKES BY DAY OF WEEK CONTACTED

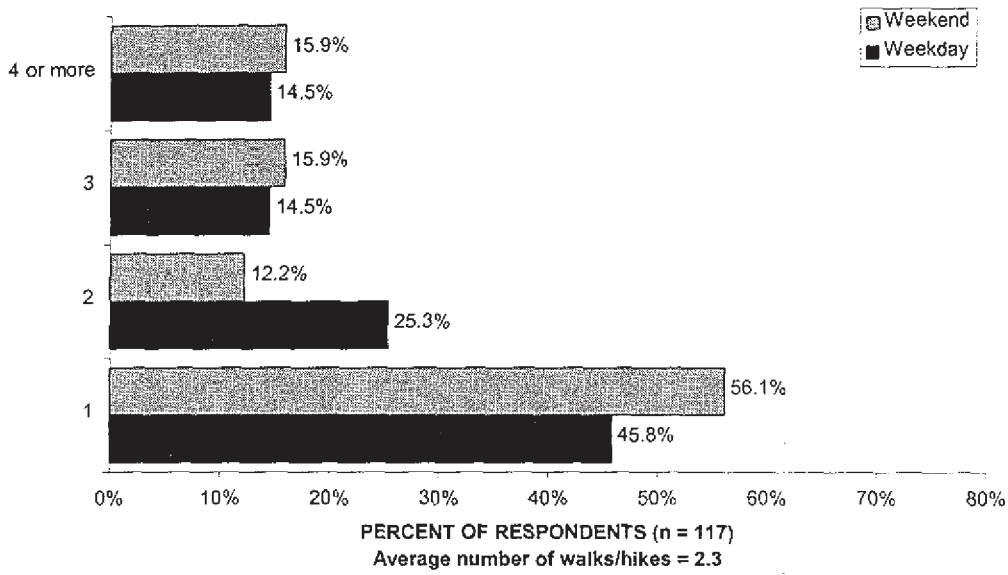


The effect of day of week contacted, however, varied by contact point. Figure 4.52 shows that Summerland respondents contacted on the weekend were more likely to take a single walk/hike and respondents contacted on weekdays were more likely to take multiple walks/hikes, $\chi^2(3) = 29.29$, $p < .001$. Figure 4.53 shows the same pattern for Comet Falls respondents, $\chi^2(3) = 12.64$, $p = .005$. There were no differences in the

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number of walks/hikes taken by respondents contacted on weekdays or weekend days at Glacier Basin or Mount Fremont (see Figures 4.50 & 4.51), p 's > .19.

FIGURE 4.50: Q-6
NUMBER OF WALKS/HIKES FOR RESPONDENTS TO GLACIER BASIN



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FIGURE 4.51: Q-6
NUMBER OF WALKS/HIKES FOR RESPONDENTS TO MOUNT FREMONT

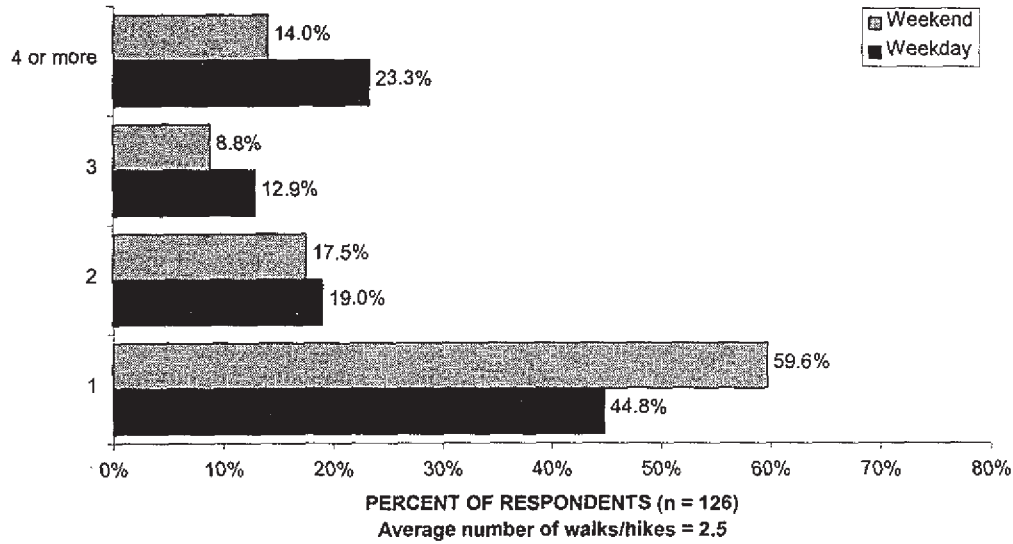
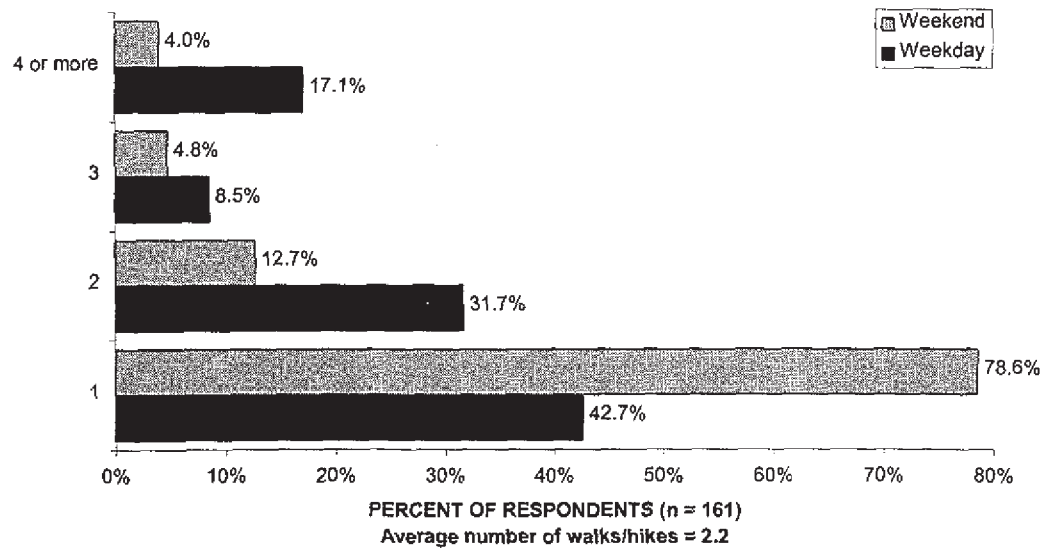
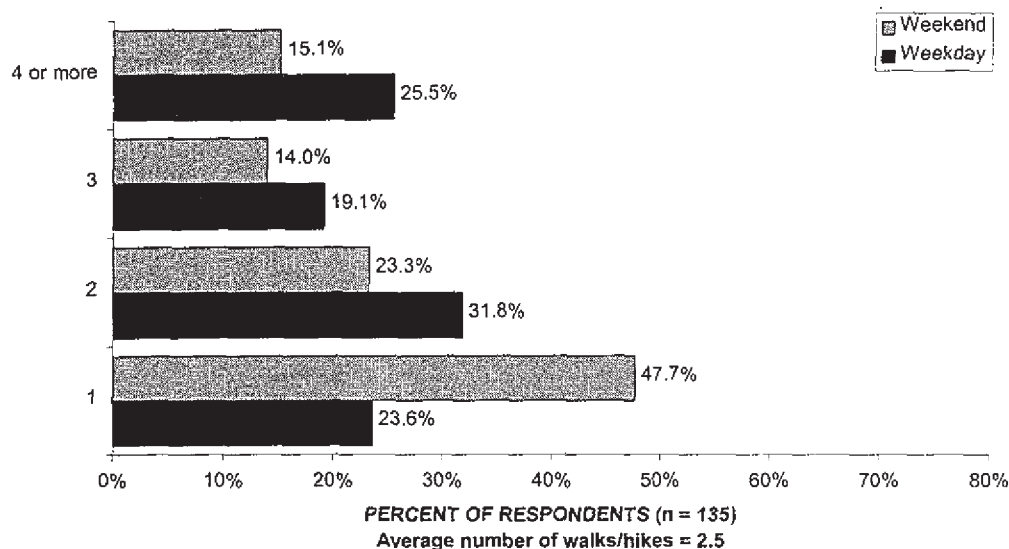


FIGURE 4.52: Q-6
NUMBER OF WALKS/HIKES FOR RESPONDENTS TO SUMMERLAND



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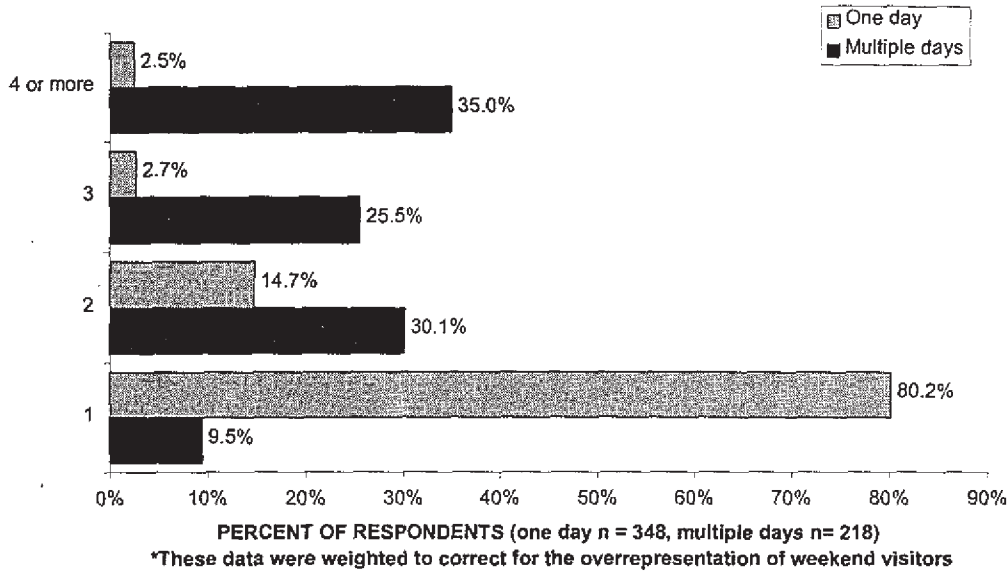
FIGURE 4.53: Q-6
NUMBER OF WALKS/HIKES FOR RESPONDENTS TO COMET FALLS



It may be that people took more walks/hikes because they spent more days in MORA. As noted earlier (see p. 70), more people contacted on weekdays spent multiple days in MORA than people contacted on weekends. As hypothesized, number of walks/hikes varied by number of days spent in MORA, $\chi^2 (3) = 25.69, p < .001$. Figure 4.54 shows that 80.0% of respondents spending one day in MORA took only one hike compared to 9.5% of respondents spending multiple days in MORA, and respondents spending multiple days in MORA were more likely to take 2 or more hikes (91.5%) compared to respondents spending only the day in MORA (18.8%). Additional analyses revealed, however, that number of days spent in MORA did not completely explain the observed differences in day of week contacted. The relationships, however, are complex as they differ by contact point, and can be further explored if desired.

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FIGURE 4.54: Q-6
NUMBER OF WALKS/HIKES BY NUMBER OF DAYS SPENT IN MORA*



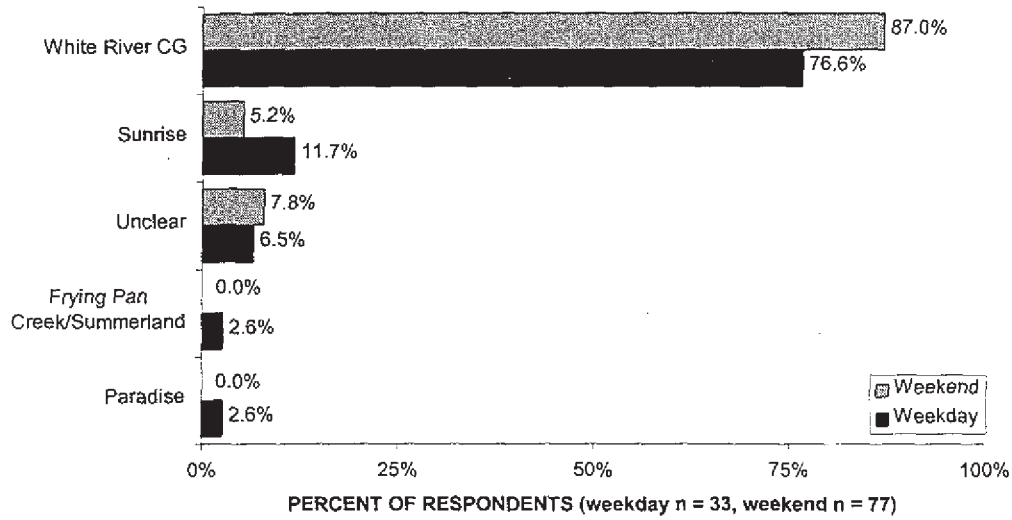
Point from which respondents began hiking. Effects of day of week contacted and contact point were not tested for this variable because the majority of respondents began the hike at the site where they were contacted. This resulted in many empty cells limiting the use of meaningful statistical tests. To provide readers with useful information, data are presented by day of week contacted for each contact point.

Not surprisingly, the majority of respondents began the hike on which they were contacted at the most commonly used trailhead for that particular hike. Specifically, 81.8% of Glacier Basin respondents began hiking at the White River Campground, 82.9% of Mount Fremont respondents began hiking at Sunrise, 78.1% of Summerland respondents began hiking at Frying Pan Creek/Summerland turnouts, and 71.4% of

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Comet Falls respondents began hiking at the Comet Falls turnout (See Figures 4.55-4.58).

FIGURE 4.55: Q-7
WHERE RESPONDENTS CONTACTED AT GLACIER BASIN BEGAN WALK/HIKE



IV. Trip Characteristics

FIGURE 4.56: Q-7
WHERE RESPONDENTS CONTACTED AT MOUNT FREMONT BEGAN WALK/HIKE

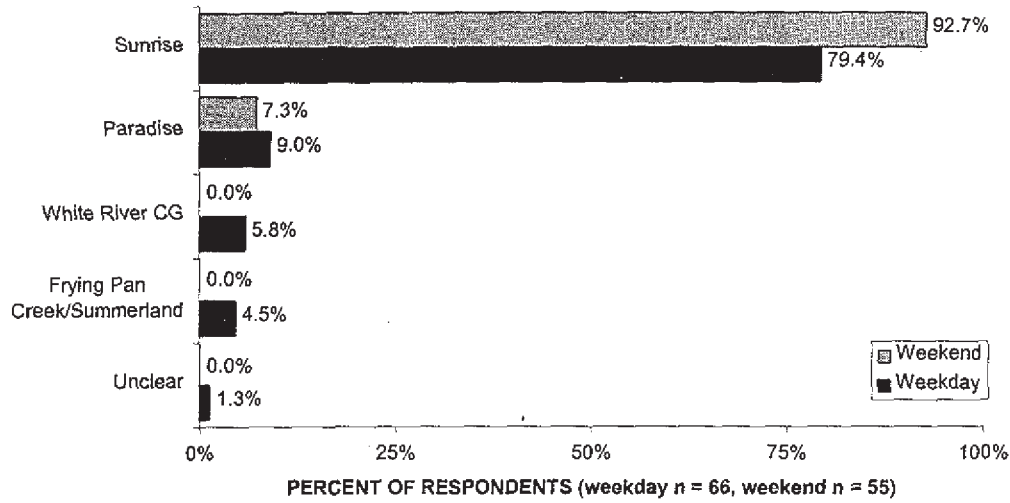
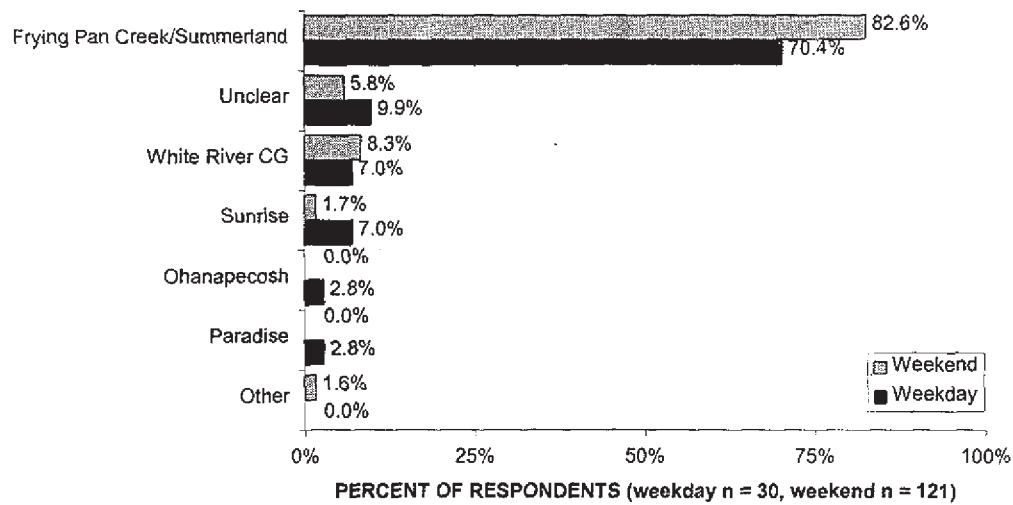
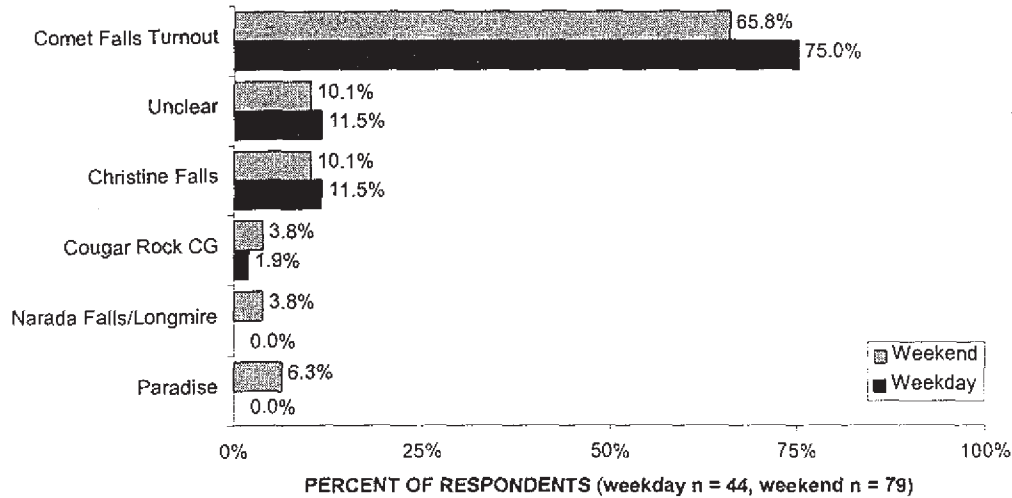


FIGURE 4.57: Q-7
WHERE RESPONDENTS CONTACTED AT SUMMERLAND BEGAN WALK/HIKE



IV. Trip Characteristics

FIGURE 4.58: Q-7
WHERE RESPONDENTS CONTACTED AT COMET FALLS BEGAN WALK/HIKE



Distance hiked and time spent hiking. The number of miles walked/hiked varied by contact point, $F(3, 507) = 18.04, p < .001$. Post hoc Tukey tests revealed 1) the number of miles walked by respondents at Summerland ($M = 8.8$) were significantly more than any of the other three contact points; 2) the miles walked by respondents at Glacier Basin ($M = 7.4$) and at Mount Fremont ($M = 7.0$) did not differ significantly; and 3) the number of miles walked by respondents to Comet Falls ($M = 5.4$) were significantly less than any of the other three contact points (see Figures 4.59 - 4.62).

IV. Trip Characteristics

FIGURE 4.59: Q-7
MILES WALKED/HIKED BY GLACIER BASIN RESPONDENTS

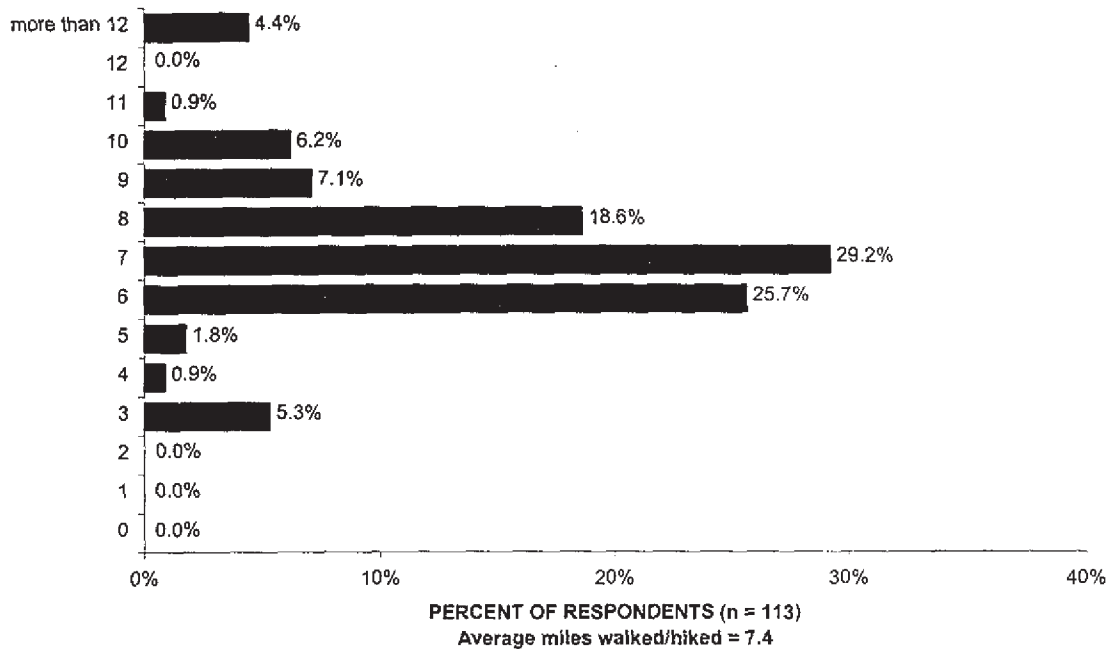
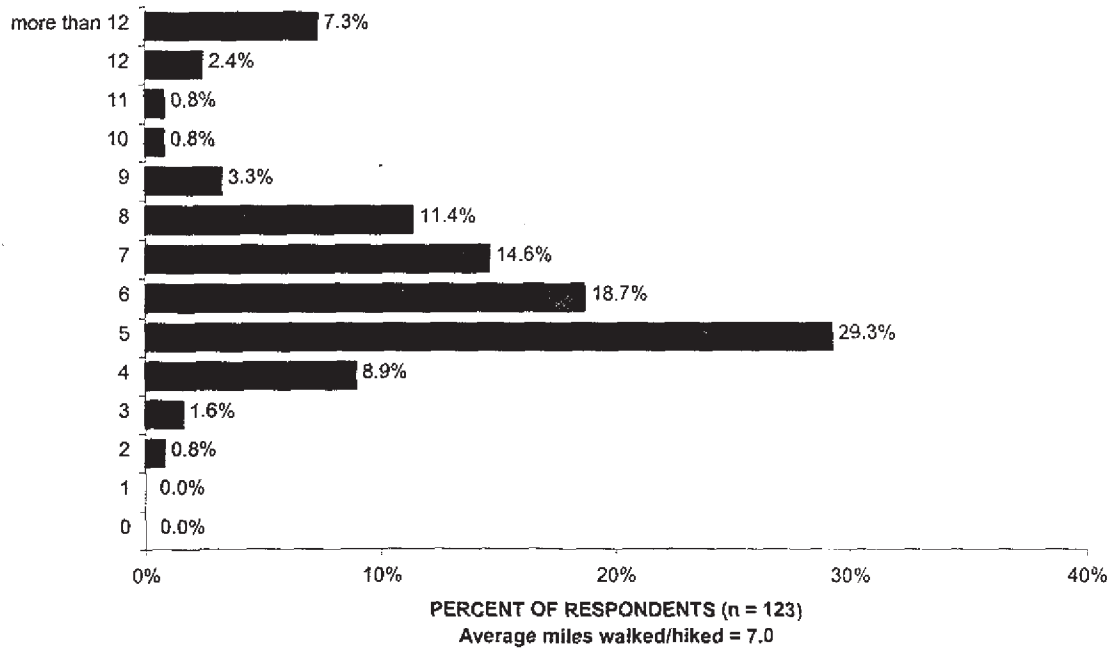


FIGURE 4.60: Q-7
MILES WALKED/HIKED BY MOUNT FREMONT RESPONDENTS



IV. Trip Characteristics

FIGURE 4.61: Q-7
MILES WALKED/HIKED BY SUMMERLAND RESPONDENTS

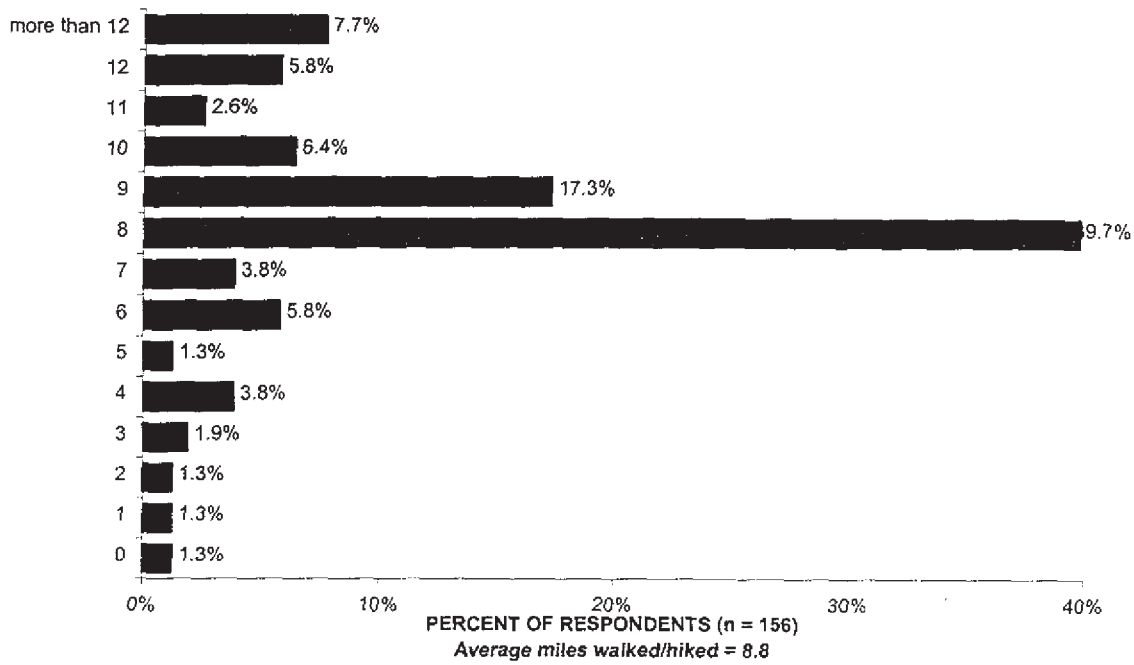
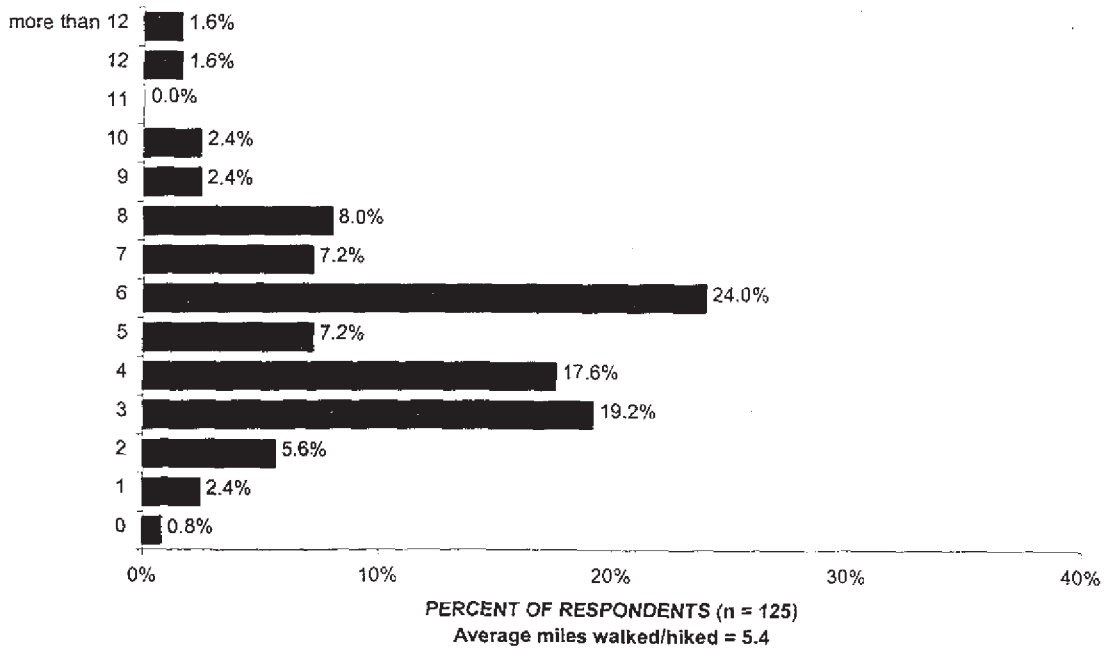


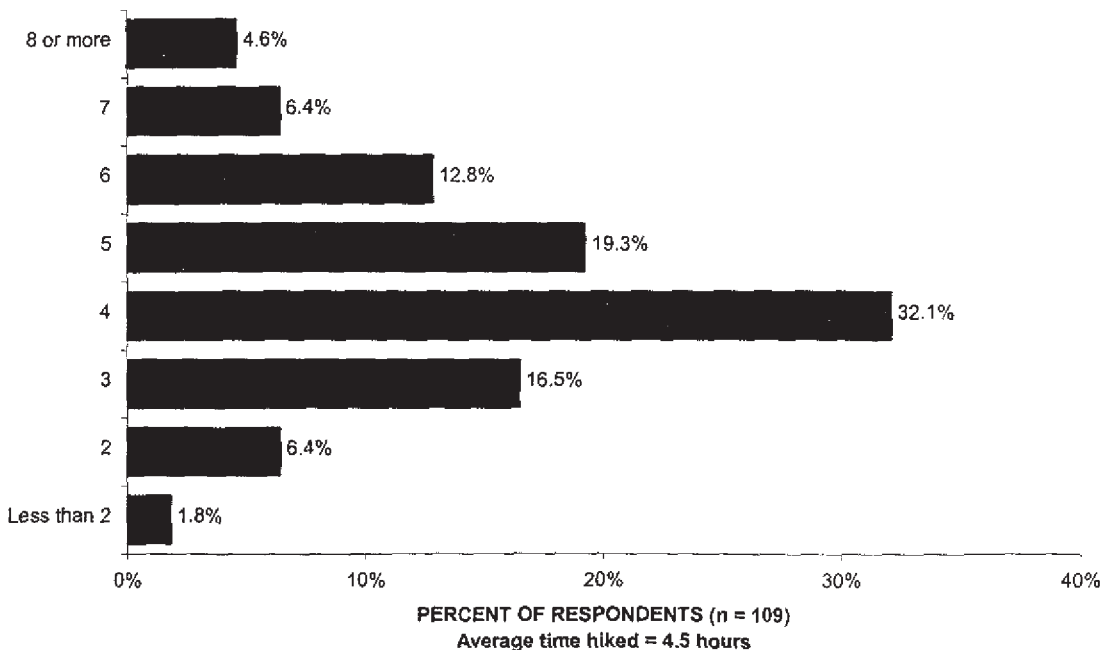
FIGURE 4.62: Q-7
MILES WALKED/HIKED BY COMET FALLS RESPONDENTS



IV. Trip Characteristics

The total time spent on the walk/hike during which the visitor was contacted varied by contact point, $F(3, 502) = 10.34, p < .001$. Post hoc Tukey tests indicated that 1) the time spent hiking by respondents to Summerland ($M = 5.1$ hrs) was significantly longer than any other contact point; 2) the time spent hiking by respondents contacted at Glacier Basin ($M = 4.5$ hrs) and those contacted at Mount Fremont ($M = 4.0$ hrs) did not differ significantly; and 3) the time spent hiking by respondents contacted at Comet Falls ($M = 3.9$ hrs) was significantly less than Glacier Basin, but did not differ from Mount Fremont. This pattern of means is consistent with those for distance hiked. Figures 4.63 – 4.66 showed that time spent hiking is normally distributed around the mean for Glacier Basin, Mount Fremont, and Comet Falls, but least like a bell curve for Summerland. These distributions are also consistent with those observed for distance hiked.

FIGURE 4.63: Q-7
TOTAL HOURS HIKED BY GLACIER BASIN RESPONDENTS



IV. Trip Characteristics

FIGURE 4.64: Q-7
TOTAL HOURS HIKED BY MOUNT FREMONT RESPONDENTS

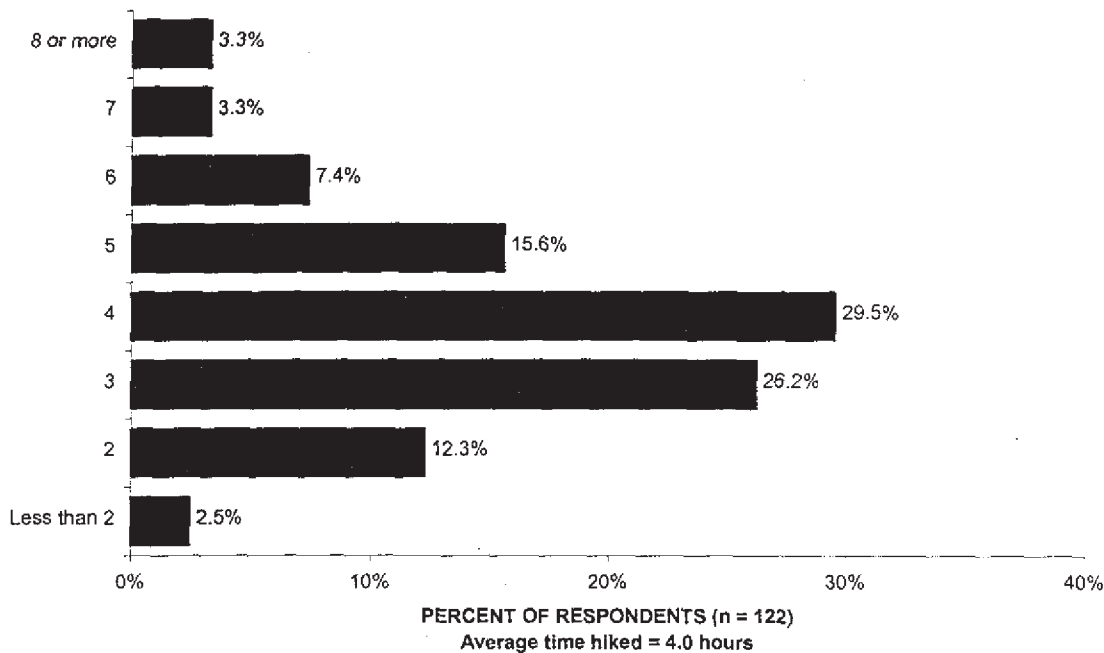
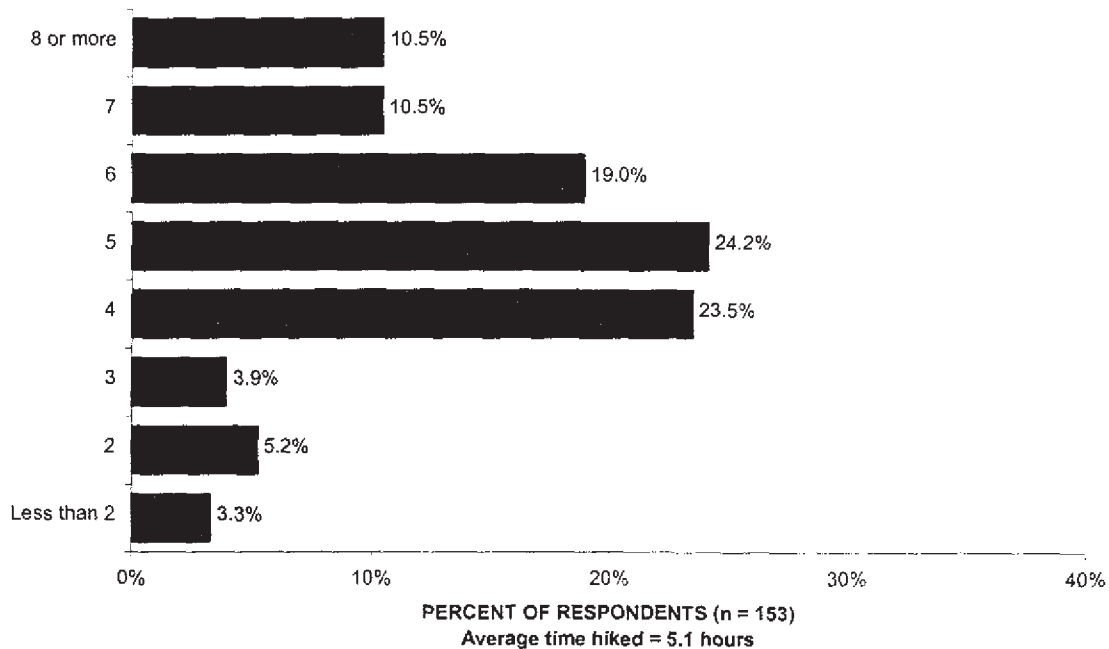
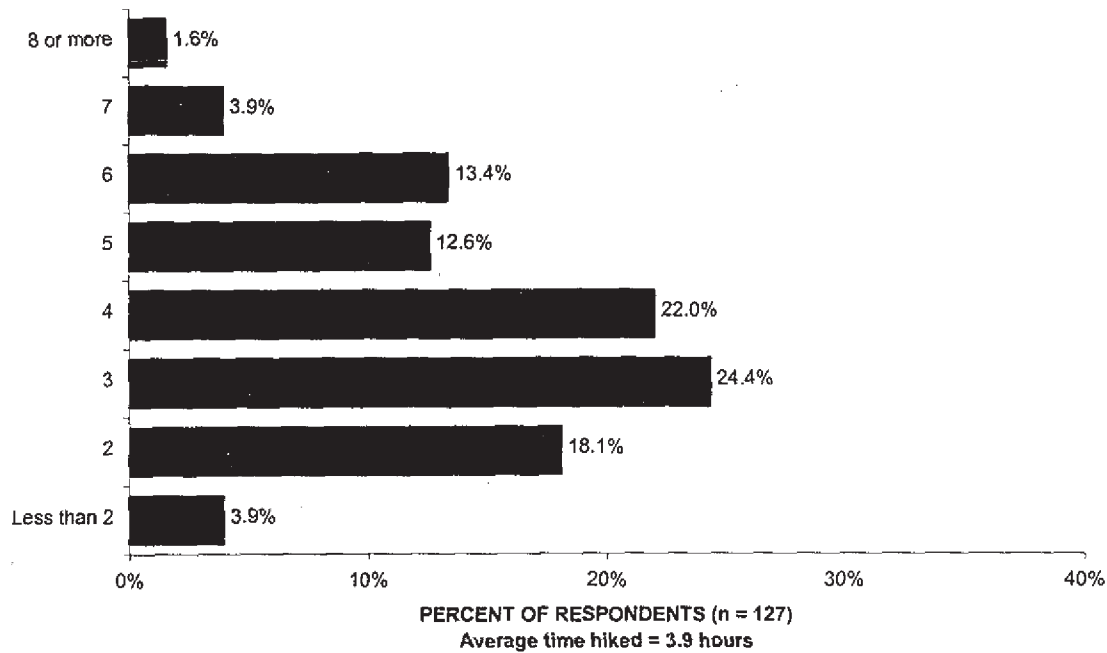


FIGURE 4.65: Q-7
TOTAL HOURS HIKED BY SUMMERLAND RESPONDENTS



IV. Trip Characteristics

FIGURE 4.66: Q-7
TOTAL HOURS HIKED BY COMET FALLS RESPONDENTS



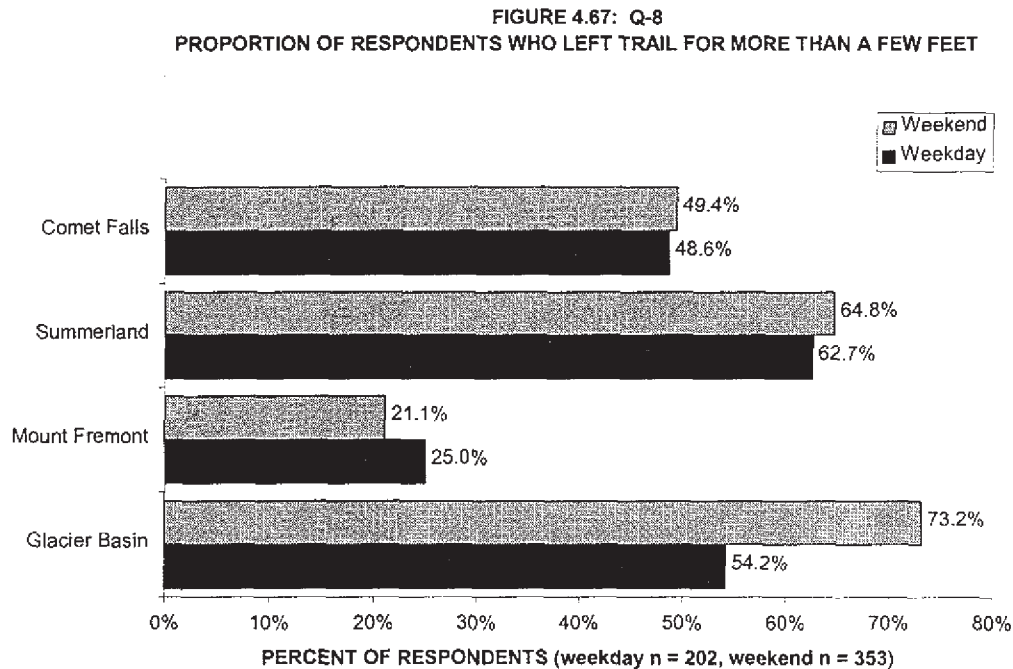
Leaving the trail

The proportion of respondents leaving the trail for more than a few feet depended on day of week contacted, $\chi^2 (3) = 9.00$, $p = .003$. More respondents contacted on the weekend (55.8%) left the trail than respondents contacted on weekdays (42.6%). The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses.

Figure 4.67 shows that the day of week contacted effect is due to a larger proportion of respondents contacted on the weekend at Glacier Basin leaving the trail than those contacted on weekdays (73.2% vs. 54.2%), $\chi^2 (1) = 6.40$, $p = .011$. There were no differences in the proportion of respondents leaving the trail for the other three contact points, p 's $> .54$. Overall, Glacier Basin and Summerland had the largest

IV. Trip Characteristics

proportion of respondents who left the trail for more than a few feet (63.6% and 63.9%, respectively). At Comet Falls, 48.5% of respondents left the trail and at Mount Fremont, only 24.0% of respondents left the trail.



Respondents were asked to indicate the reasons why they left the trail. Because there may have been more than one reason, multiple responses were allowed (see Figure 4.68). The most frequent reason for leaving the trail more than a few feet was to go to the bathroom (51.0%). Other reasons included viewing wildflowers/wildlife (32.3%), other (32.3%), to explore (28.8%), and to get a better view (27.8%). The effect of day of week contacted and contact point was examined for each reason.

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FIGURE 4.68: Q-8
REASONS WHY RESPONDENTS LEFT TRAIL

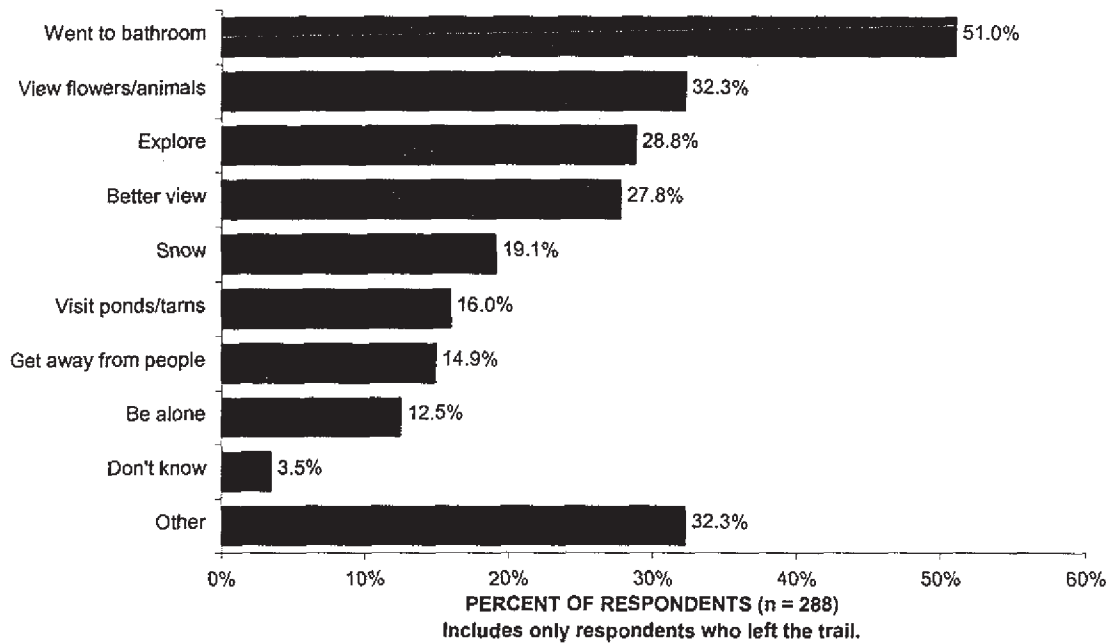
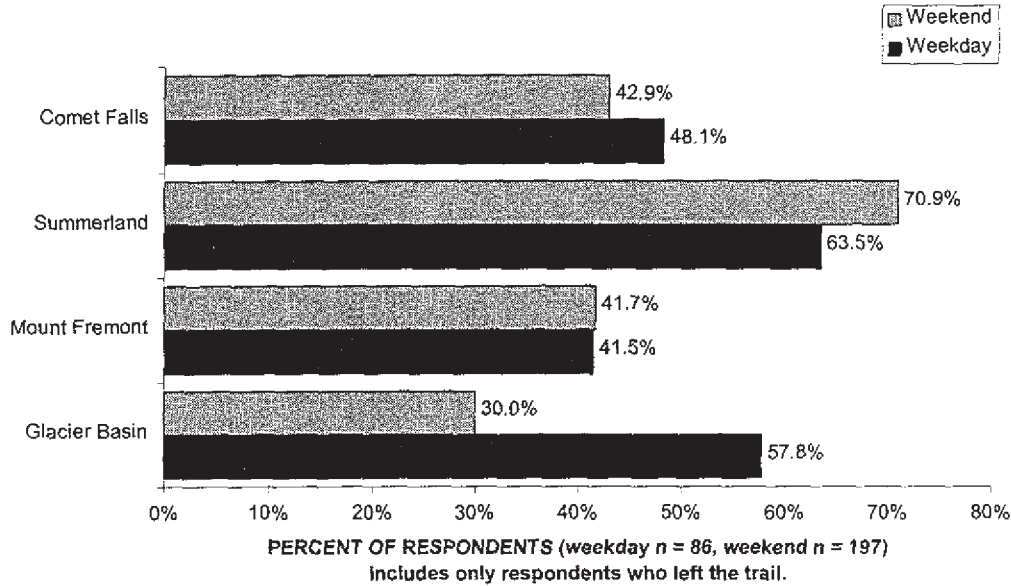


Figure 4.69 shows that at Glacier Basin a larger proportion of respondents contacted on a weekday left the trail to go to the bathroom than respondents contacted on the weekend (57.8% vs. 30.0%), $\chi^2 (1) = 8.15, p = .004$. Additional analyses indicated that the increased number of respondents contacted on weekdays leaving the trail to go to the bathroom than those respondents contacted on the weekend is not due to them being on the trail for a longer amount of time or for them hiking further. Thus, the cause of this difference is unclear at this point. There were no differences between weekday and weekend day for the other contact points, p 's > .37. Overall, Summerland had a significantly larger proportion of respondents leave the trail to go to the bathroom (67.9%) than any of the other contact points (67.9% vs. 45.8%, 41.9%, or 41.5%), $\chi^2 (3) = 21.40, p < .001$.

IV. Trip Characteristics

FIGURE 4.69: Q-8
PROPORTION OF RESPONDENTS WHO WENT OFF TRAIL TO GO TO THE BATHROOM



As can be seen in Figure 4.70, significantly more respondents contacted at Glacier Basin left the trail to see ponds/tarns than respondents contacted at the other points (34.2% vs. 9.2%, 10.9%, or 6.9%), $\chi^2(1) = 24.30, p < .001$. Glacier Basin also had a larger proportion of respondents who left the trail to explore than respondents contacted at the other points (41.8% vs. 24.6%, 21.8%, or 24.1%), $\chi^2(1) = 9.83, p = .020$ (see Figure 4.71).

IV. Trip Characteristics

FIGURE 4.70: Q-8
PROPORTION OF RESPONDENTS WHO WENT OFF TRAIL TO VISIT PONDS OR TARNs

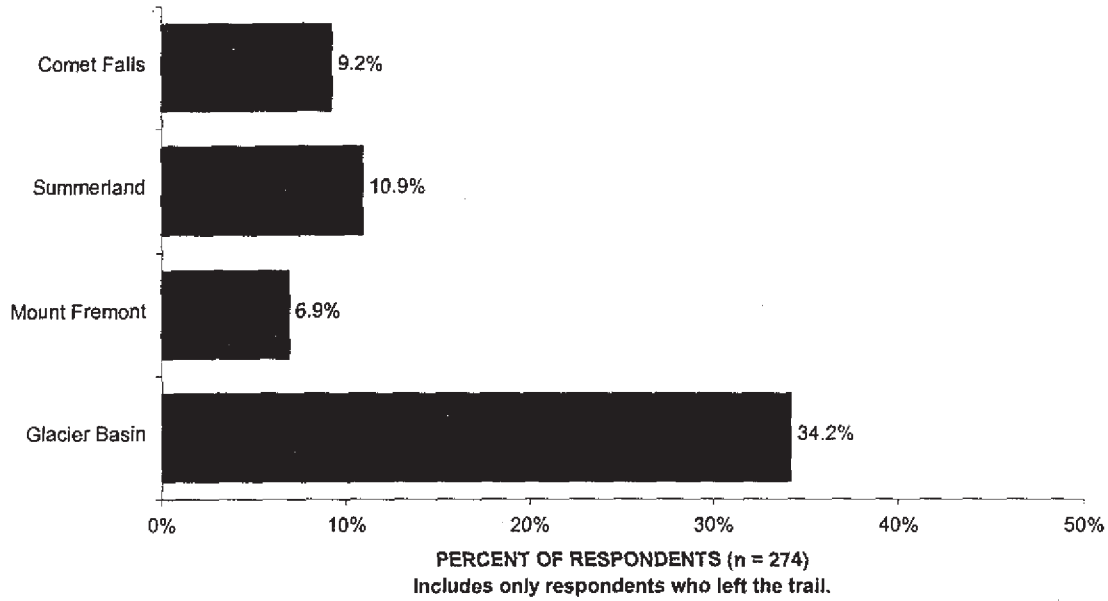
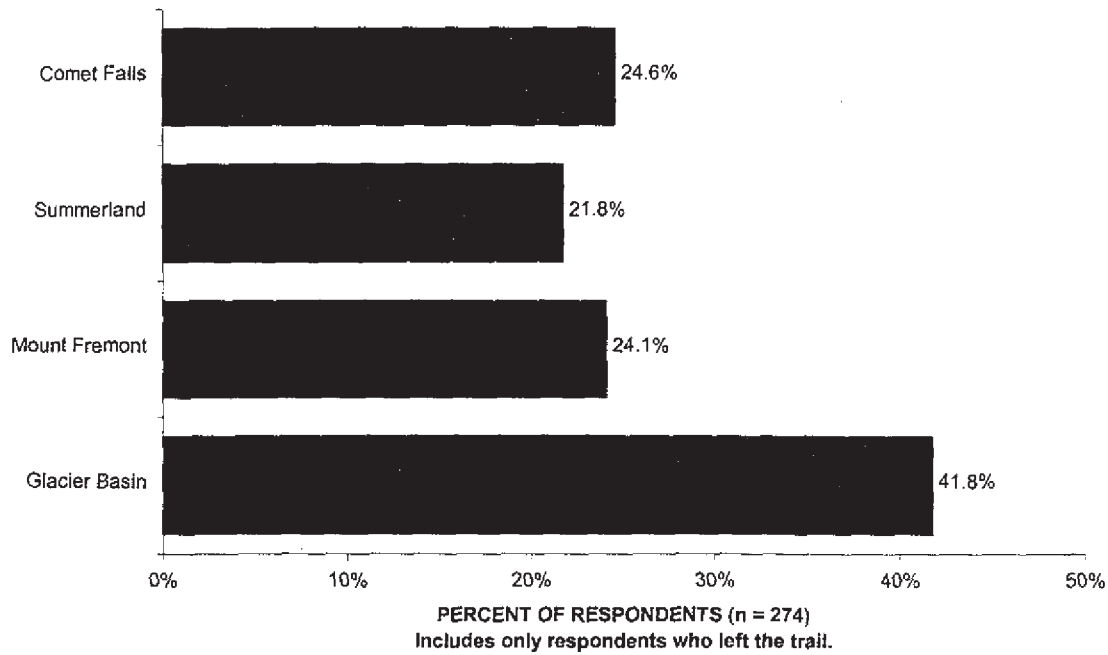


FIGURE 4.71: Q-8
PROPORTION OF RESPONDENTS WHO WENT OFF TRAIL TO EXPLORE



V. TRIP EXPERIENCES AND EVALUATION

The WTVS asked respondents a variety of questions concerning the conditions that they experienced during their trip to a Wilderness Trail area. This section reports the conditions they described and their evaluations of those conditions.

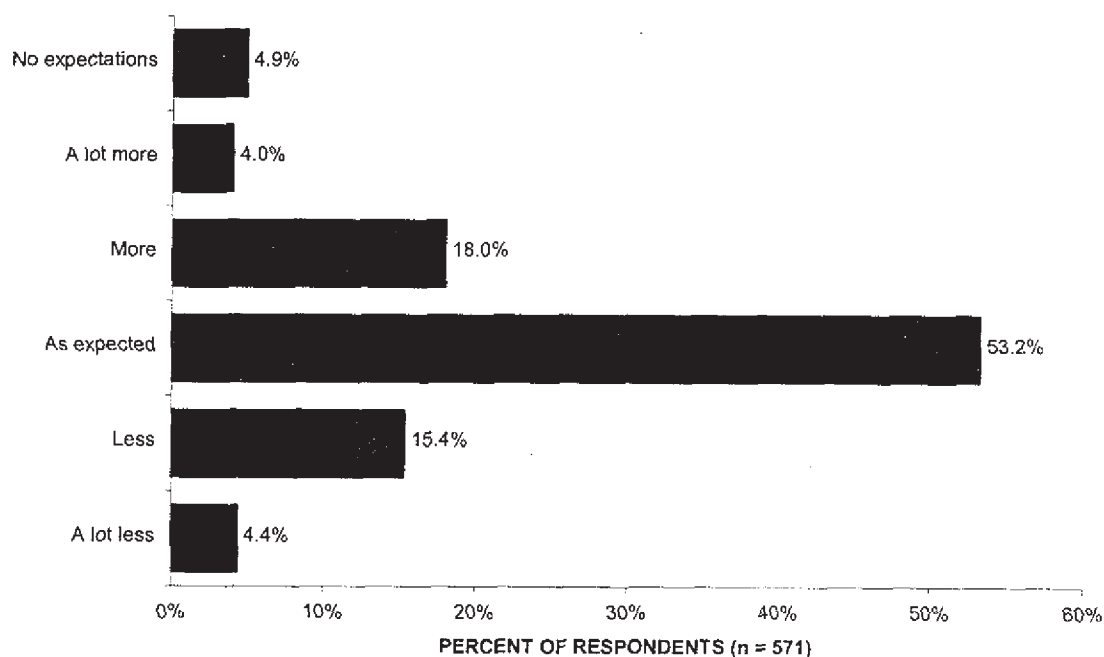
V. Trip Experiences and Evaluation

V. Trip Experiences and Evaluation

Density of Visitors

Expectations. Question 11 asked respondents about their expectations regarding the number of visitors they would encounter. It should be noted that expectations reported retrospectively (as these were) may differ from those reported prospectively. Figure 5.1 shows that over half of respondents saw the number of other visitors that they expected. About one-fourth of respondents saw more visitors than expected and 20% saw fewer than expected.

FIGURE 5.1: Q-11
NUMBER OF VISITORS SEEN vs. NUMBER EXPECTED TO SEE

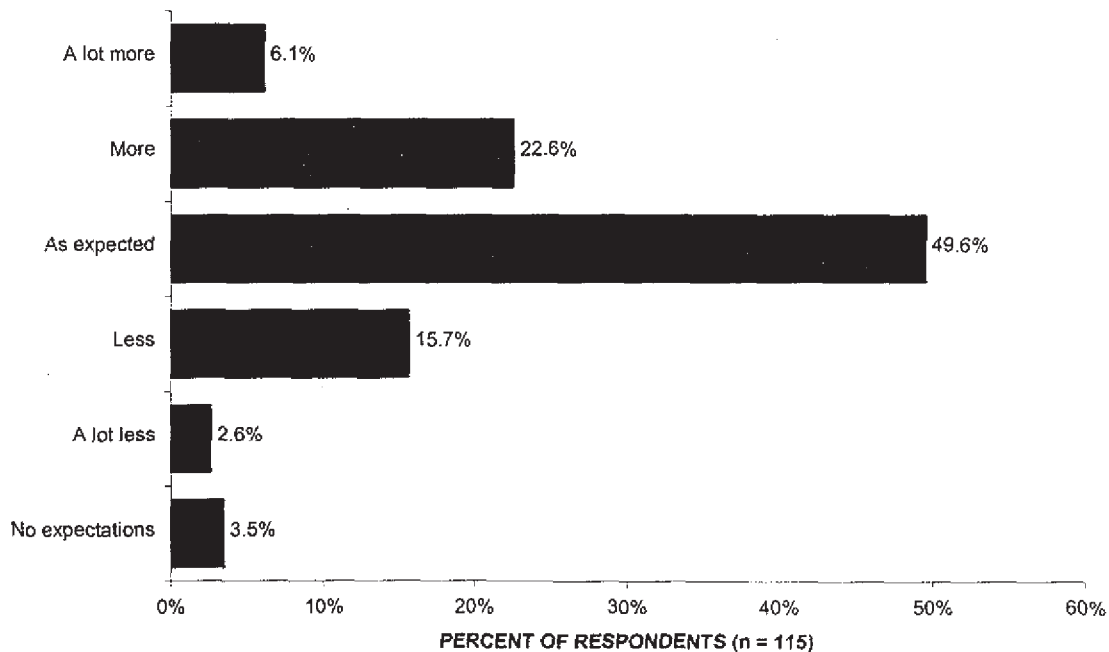


Expectations, however, varied by contact point, $\chi^2(9) = 23.46$ $p = .005$ (recoded into the categories less than expected, as expected, more than expected, and no expectations). More respondents contacted at Mount Fremont (57.6%) and Comet Falls (58.5%) saw the number of other visitors they expected than

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respondents contacted at Glacier Basin (49.6%) or Summerland (48.1%) (see Figures 5.2 - 5.5). Glacier Basin had the largest number of respondents reporting seeing 'more' (22.6%) and 'a lot more' (6.1%) visitors than expected; Summerland had the greatest number of respondents who saw fewer people than expected (29.0% vs. 18.3%, 14.1% and 12.8%). More respondents contacted at Comet Falls had no expectations than respondents at the other three contact points (8.1% vs. 3.5%, 5.6%, and 2.5%). This higher proportion of respondents with no expectations at Comet Falls is consistent with the higher proportion of respondents with no specific destination (see p. 61). It may be that a small proportion of respondents contacted at Comet Falls are tourists with no plans and no knowledge on which to base any expectation of other visitors they would encounter.

FIGURE 5.2: Q-11
GLACIER BASIN RESPONDENTS' COMPARISON OF VISITORS SEEN TO THOSE EXPECTED



V. Trip Experiences and Evaluation

FIGURE 5.3: Q-11
MOUNT FREMONT RESPONDENTS' COMPARISON OF VISITORS SEEN TO THOSE EXPECTED

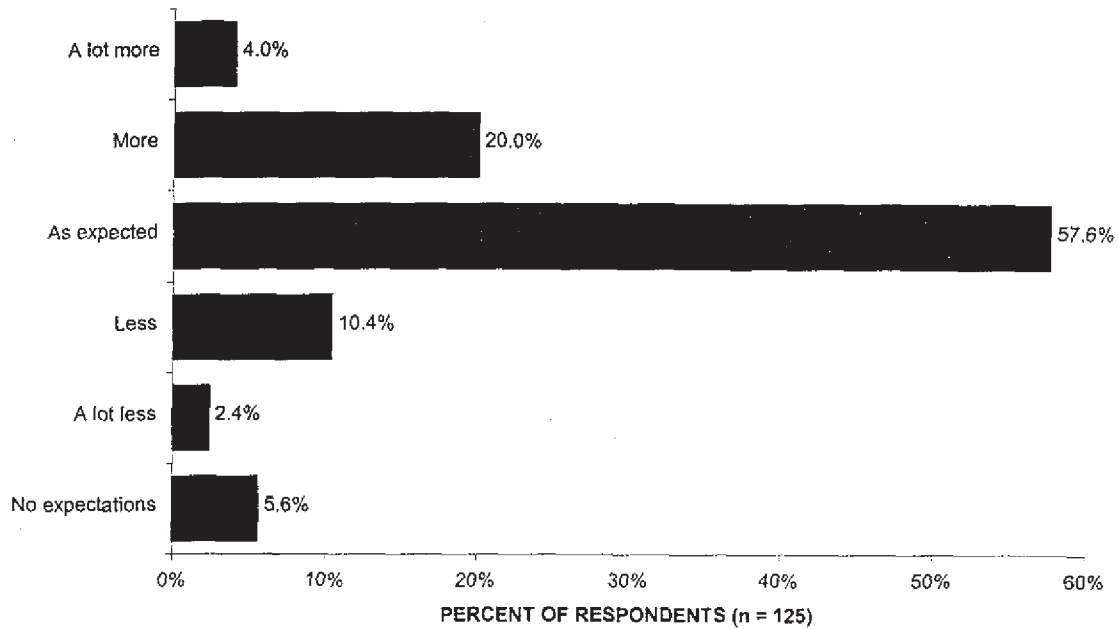
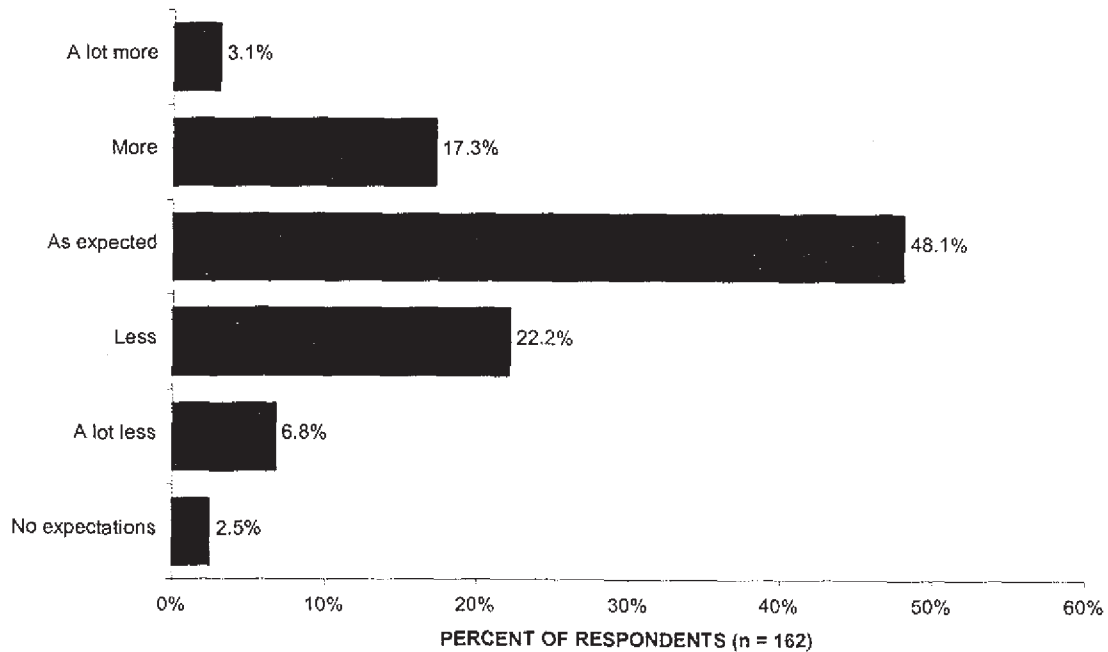
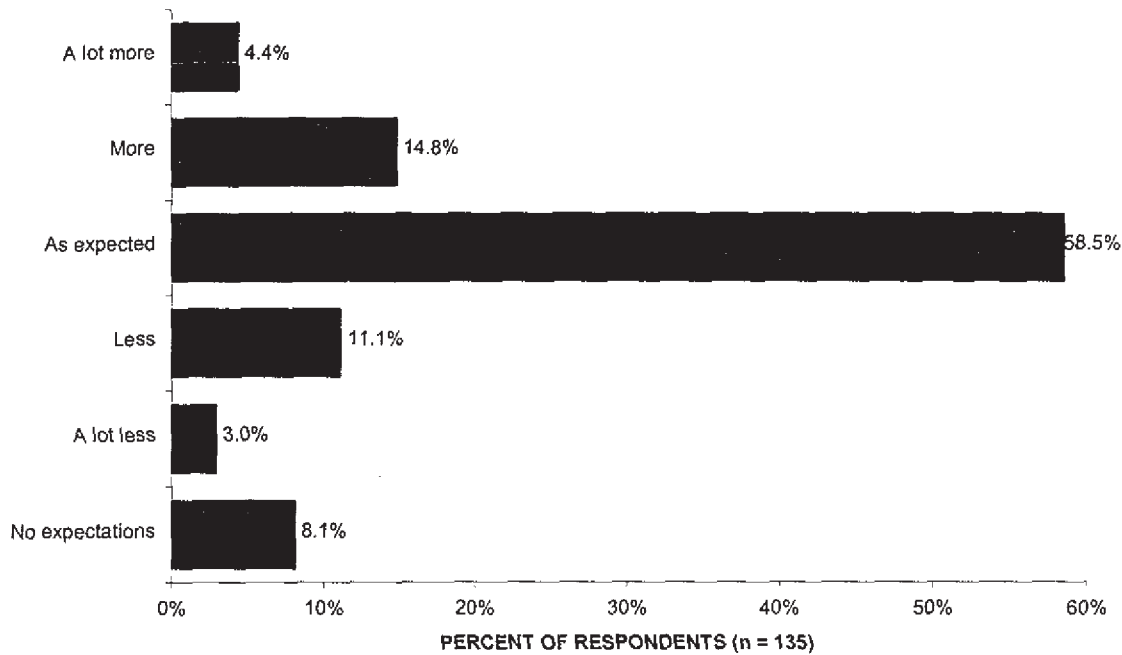


FIGURE 5.4: Q-11
SUMMERLAND RESPONDENTS' COMPARISON OF VISITORS SEEN TO THOSE EXPECTED



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FIGURE 5.5: Q-11
COMET FALLS RESPONDENTS' COMPARISON OF VISITORS SEEN TO THOSE EXPECTED



The lack of an effect of day of week contacted on expected number of visitors in conjunction with the fact of increased visitation on weekends compared to weekdays suggests that respondents have incorporated into their expectations differences in visitor density on weekdays and weekends. However, observed effects of day of week contacted for preferred number of visitors (see next section) suggests that an adjustment for increased visitor density on weekends is not taken into account in one's preferences.

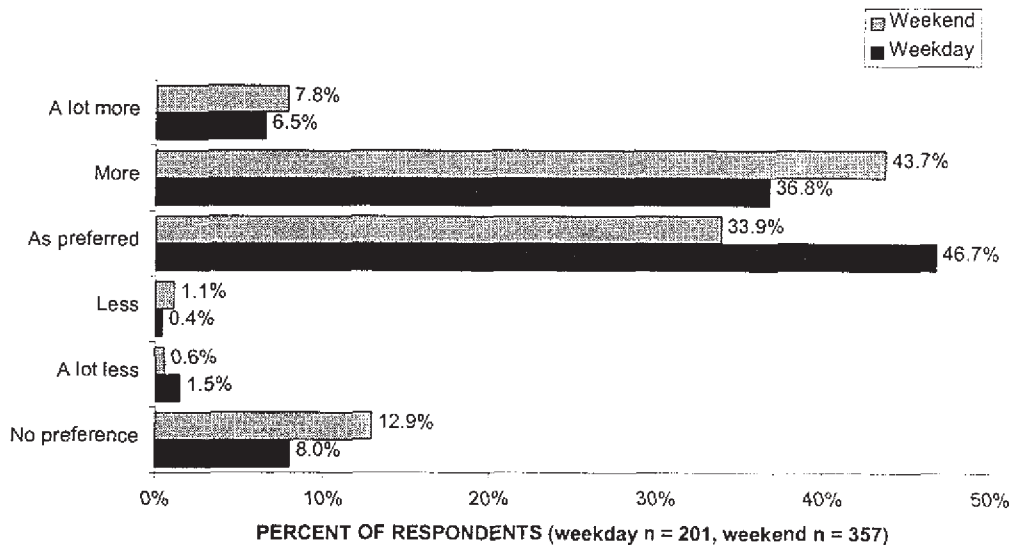
Preferences. Preferred number of visitors varied by day of week, $\chi^2(3) = 16.08$, $p = .001$ (re-coded into the categories less than preferred, as preferred, more than preferred, and no preference). The sample was weighted to correct for

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the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses.

Of respondents contacted on weekdays, 46.3% of respondents saw the number of visitors they preferred to see and 36.8% saw more visitors than they preferred (see Figure 5.6). Of respondents contacted on weekends, 33.9% saw the number of visitors they preferred and 43.7% saw more visitors than they preferred. Also, respondents contacted on the weekend were less likely to have no preferences than respondents contacted on weekdays (12.9% vs. 8.0%, respectively).

FIGURE 5.6: Q-12
RESPONDENTS' COMPARISON OF VISITORS SEEN TO THE NUMBER THEY PREFER TO SEE

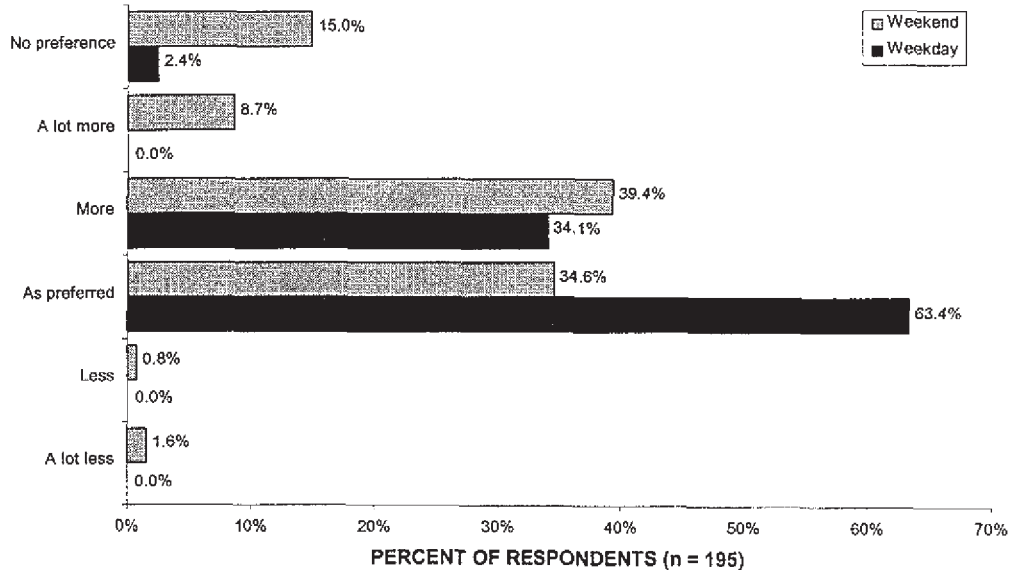


Further analyses indicated that the effect of day of week contacted on preferred number of visitors varied by contact point. The pattern of data for

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respondents contacted at Comet Falls, Mount Fremont, and Glacier Basin was comparable to the overall pattern. For respondents contacted at Summerland, 63.4% of respondents contacted on the weekday saw their preferred number of visitors, 34.1% saw more than their preferred number of visitors, and 2.4% saw a lot more than their preferred number of visitors. In contrast, 34.6% of respondents contacted on the weekend saw their preferred number of visitors, 48.1% saw more than their preferred number of visitors, and 15.0% had no preferences (see Figure 5.7).

FIGURE 5.7: Q-11
SUMMERLAND RESPONDENTS' COMPARISON OF VISITORS SEEN TO THE NUMBER THEY PREFER TO SEE



Impacts of Other Visitors

Detraction from experience. Seventeen and one half percent of respondents reported one or more incidents when other visitors detracted from

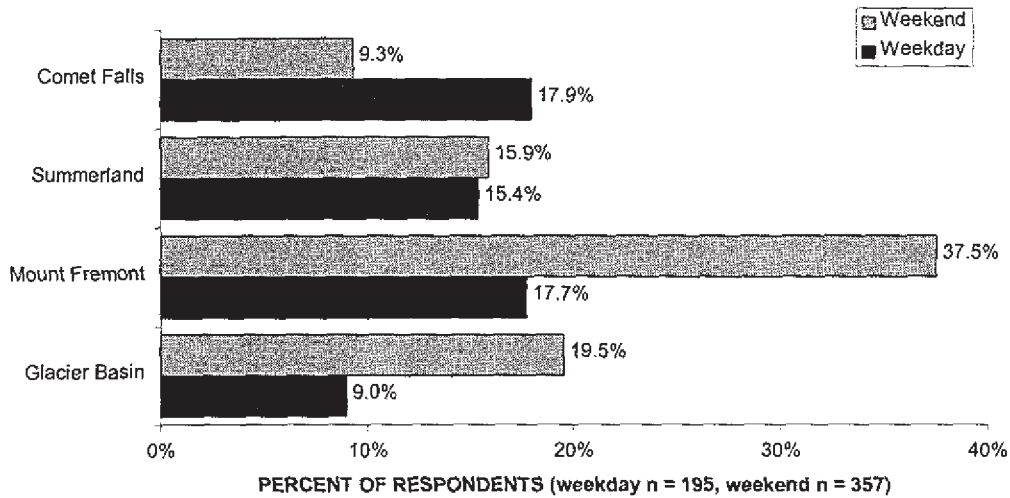
V. Trip Experiences and Evaluation

their enjoyment. This proportion, however, varied by contact point, $\chi^2(3) = 10.57$, $p = .014$. Respondents contacted at Mount Fremont were more likely to report that other visitors detracted from their experience than respondents at the other three contact points (26.8% vs. Glacier Basin = 16.5%, Summerland = 15.7%, and Comet Falls = 12.0%). The Mount Fremont trail is a wide-open, rocky trail where sound travels easily. Thus, other visitors may be seen and heard more easily at Mount Fremont than at the other trails.

Further analyses revealed that the effect of contact point varied by day of week contacted. As seen in Figure 5.8, this effect is primarily due to Mount Fremont respondents contacted on the weekend being more likely to report that other visitors' behavior detracted from their experience (37.5%) than respondents contacted on weekdays (17.5%), $\chi^2(1) = 9.21$, $p = .002$. This same pattern was marginally significant at Glacier Basin, $\chi^2(1) = 3.61$, $p = .058$. Comet Falls was the only place where respondents contacted on weekdays were more likely to report other visitors detracted from their experience than respondents contacted on the weekend; however, this effect was only marginally significant, $\chi^2(1) = 2.92$, $p = .087$. The proportion of respondents contacted at Summerland that reported other visitors behavior detracted from their experience did not vary by day of week, $\chi^2(1) = 0.01$, $p = .926$.

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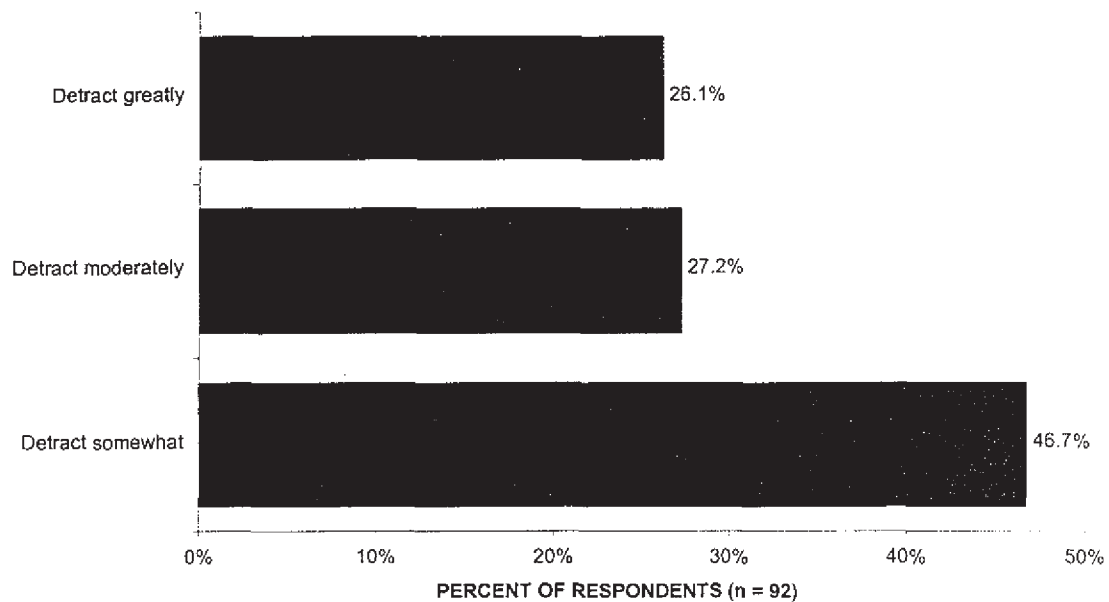
FIGURE 5.8: Q-13
PROPORTION OF RESPONDENTS WHO HAD ONE OR MORE INCIDENTS WHEN A PERSON'S
OR PARTY'S BEHAVIOR DETRACTED FROM EXPERIENCE



There were no effects of day of week contacted or contact point on the degree that other visitors' behavior detracted from the respondent's experience. For respondents who reported that another party's behavior detracted from their experience, approximately half (46.7%) of these respondents reported that other visitors' behavior detracted somewhat from their experience, one-quarter (26.1%) said it detracted moderately, and one-quarter (27.2%) said it detracted greatly from their experience (see Figure 5.9).

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FIGURE 5.9: Q-13
DEGREE THE PERSON'S OR PARTY'S BEHAVIOR THAT HAD LARGEST IMPACT DETRACTED
FROM RESPONDENTS' EXPERIENCES



Includes only the 17% of respondents indicating that another party's behavior detracted from experience.

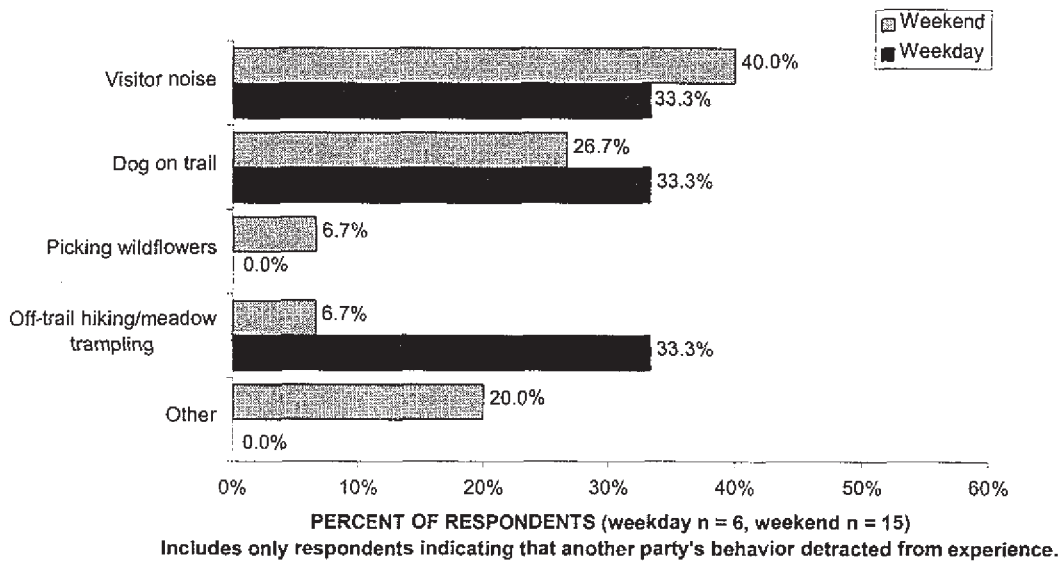
How others detracted. Respondents were asked to describe the behavior that had the largest impact in detracting from their experience. These behaviors are presented by day of week contacted for each contact point (see Figures 5.10 - 5.13). The small number of incidents reduces the reliability of the data, and thus, care should be taken when considering these results.

As seen in Figure 5.10, regardless of day of week contacted, the behaviors most often described by Glacier Basin respondents as having the largest impact on their experience were visitor noise (8 out of 21) and seeing a dog on the trail (6 out of 21). In addition, off-trail hiking/meadow trampling was the behavior described by one-third (2 out of 6) of Glacier Basin respondents contacted on

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weekdays who reported an incident where other visitors detracted from their experience.

FIGURE 5.10: Q-13
BEHAVIOR THAT HAD LARGEST IMPACT IN DETRACTING FROM GLACIER BASIN
RESPONDENTS' EXPERIENCE



Visitor noise was the behavior described by almost half (10 out of 21) of respondents contacted at Mount Fremont on weekends as having the largest impact in detracting from their experience followed by off-trail hiking/meadow trampling (28.6%; 6 out of 21) (see Figure 5.11). In contrast, no respondents contacted on weekdays described visitor noise as the behavior having the largest impact in detracting from their experience. One-fifth (5 out of 25) of respondents contacted on weekdays described off-trail hiking/meadow trampling and unsupervised children as behaviors having the largest impact in detracting from

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their experience. Noise has more effects for visitors contacted on the weekend because these people are more likely to be present on weekend days where the large number of visitors make noise a more common event.

FIGURE 5.11: Q-13
BEHAVIOR THAT HAD LARGEST IMPACT IN DETRACTING FROM MOUNT FREMONT
RESPONDENTS' EXPERIENCE

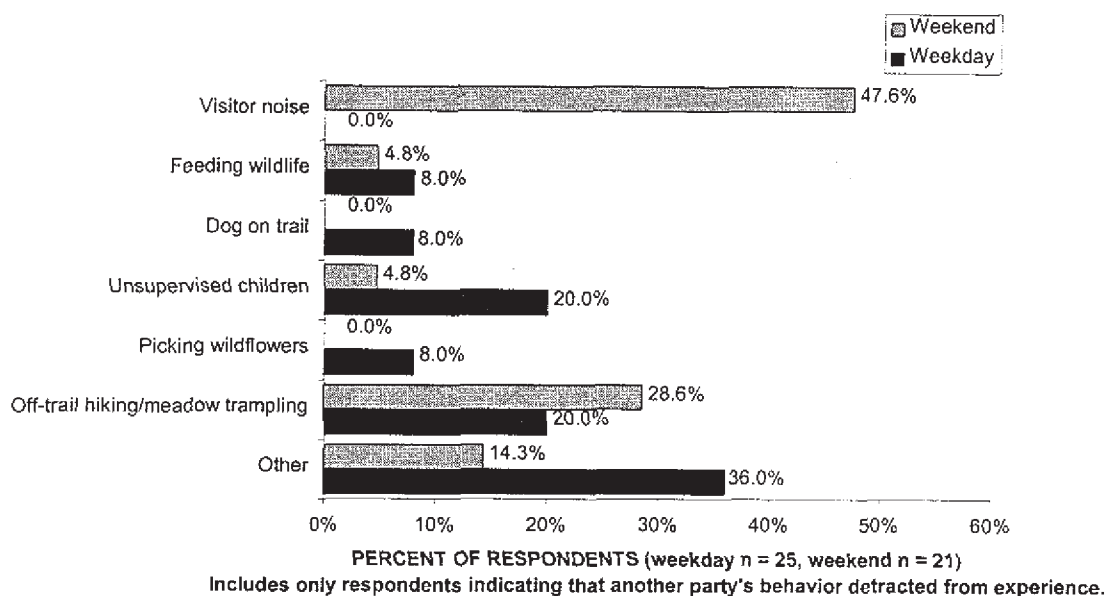
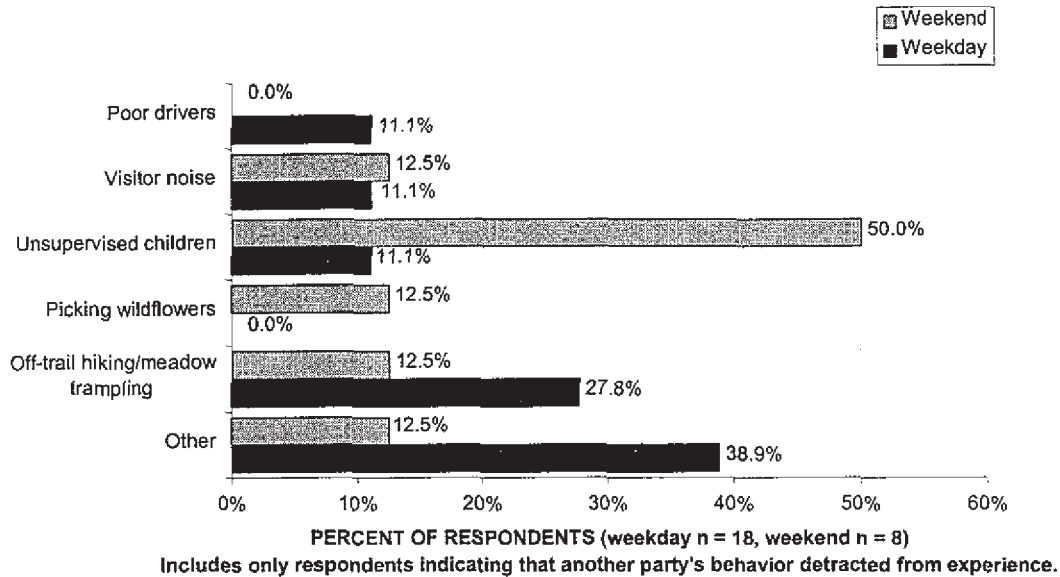


Figure 5.12 shows that 50% (4 out of 8) of respondents contacted at Comet Falls on the weekend reported unsupervised children as the behavior having the largest impact on their experience. In contrast, the behavior having the largest impact on the experiences of respondents contacted at Comet Falls on the weekday was off-trail hiking/meadow trampling (27.8% or 5 out of 18) with unsupervised children being reported by only 11.1% (2 out of 18) of respondents.

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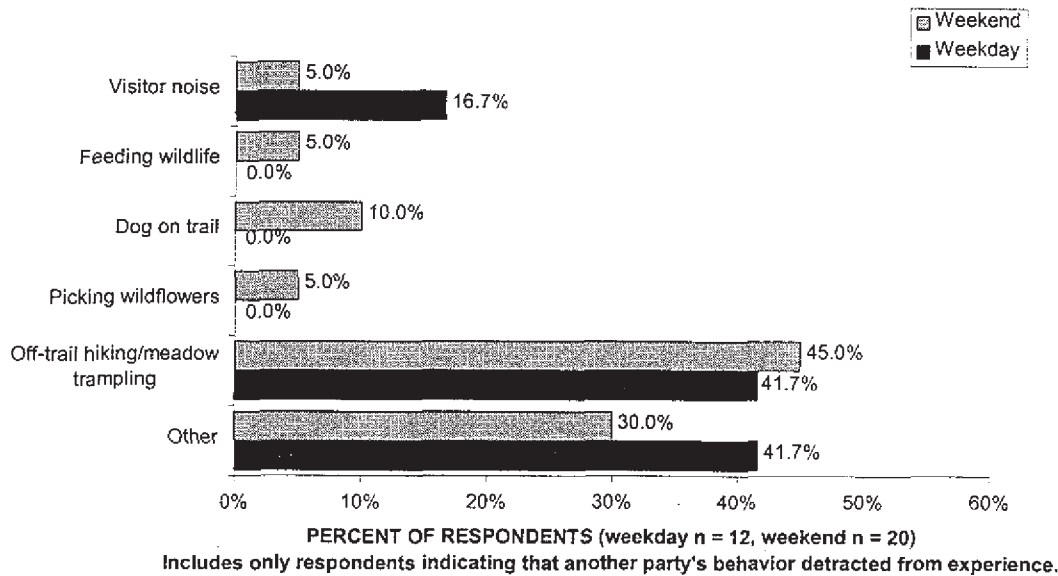
FIGURE 5.12: Q-13
BEHAVIOR THAT HAD LARGEST IMPACT IN DETRACTING FROM COMET FALLS
RESPONDENTS' EXPERIENCE



As seen in Figure 5.13, regardless of day of week contacted, off-trail hiking/meadow trampling (14 out of 32) was the behavior reported most often by respondents contacted at Summerland as having the largest impact in detracting from their experience. A wide range of behaviors were reported by the remaining respondents.

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FIGURE 5.13: Q-13
BEHAVIOR THAT HAD LARGEST IMPACT IN DETRACTING FROM SUMMERLAND
RESPONDENTS' EXPERIENCE



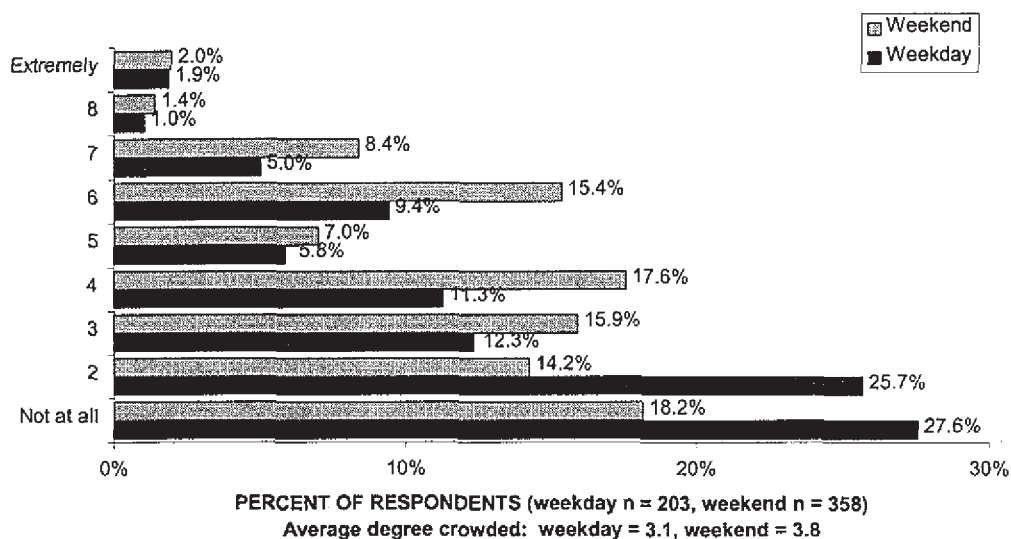
Respondents were asked to report on a second incident (if one occurred) that detracted from their experience. Only a small number of respondents (n=23) reported a second incident and thus, these data were not included here.

Degree of crowding. All respondents were asked to what degree did the number of other visitors you encountered make you feel crowded on a 9 point scale ranging from 1 (not at all crowded) to 9 (extremely crowded). Overall, the mean degree of crowding was 3.5 (SD=2.1) or 'slightly crowded'. Degree of crowding varied by day of week contacted, $F(1, 529)=17.48, p < .001$. The sample was weighted to correct for the overrepresentation of visitors contacted on the weekend, and these weighted data were used in the following analyses.

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As seen in Figure 5.14, respondents contacted on the weekend (M=3.8) reported more crowding than those contacted on weekdays (M=3.1). Review of the proportion of individuals selecting each response option showed a shift from the majority of respondents indicating little to no effects of crowding if they were contacted on a weekday to a greater proportion of respondents indicating being moderately crowded if they were contacted on the weekend. These findings are consistent with larger numbers of visitors to MORA on the weekend.

FIGURE 5.14: Q-14
DEGREE THAT THE NUMBER OF PEOPLE MADE RESPONDENTS FEEL CROWDED



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Degree of crowding also varied by contact point, $F(3, 715)^{20} = 6.49, p < .001$. Respondents contacted at Mount Fremont reported the greatest degree of crowding ($M=3.8$) followed closely by respondents contacted at Glacier Basin ($M=3.6$). Respondents contacted at Summerland ($M=3.3$) and Comet Falls ($M=3.2$) reported the smallest degree of crowding. Post hoc Tukey tests revealed that only respondents contacted at Comet Falls and those contacted at Mount Fremont differed significantly in their degree of crowding at the .05 level. Review of the proportion of respondents circling each response option for each contact point reveals a different pattern for Mount Fremont than the other three contact points (see Figures 5.15 -5.18). The proportion of visitors indicating that they felt more crowded stays relatively flat across the response options for Mount Fremont but decreases regularly for the other three contact points.

²⁰ Degrees of freedom for the error term reflects the weighting of data to correct for the overrepresentation of weekend visitors.

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FIGURE 5.15: Q-14
DEGREE THAT THE NUMBER OF PEOPLE MADE GLACIER BASIN RESPONDENTS FEEL
CROWDED

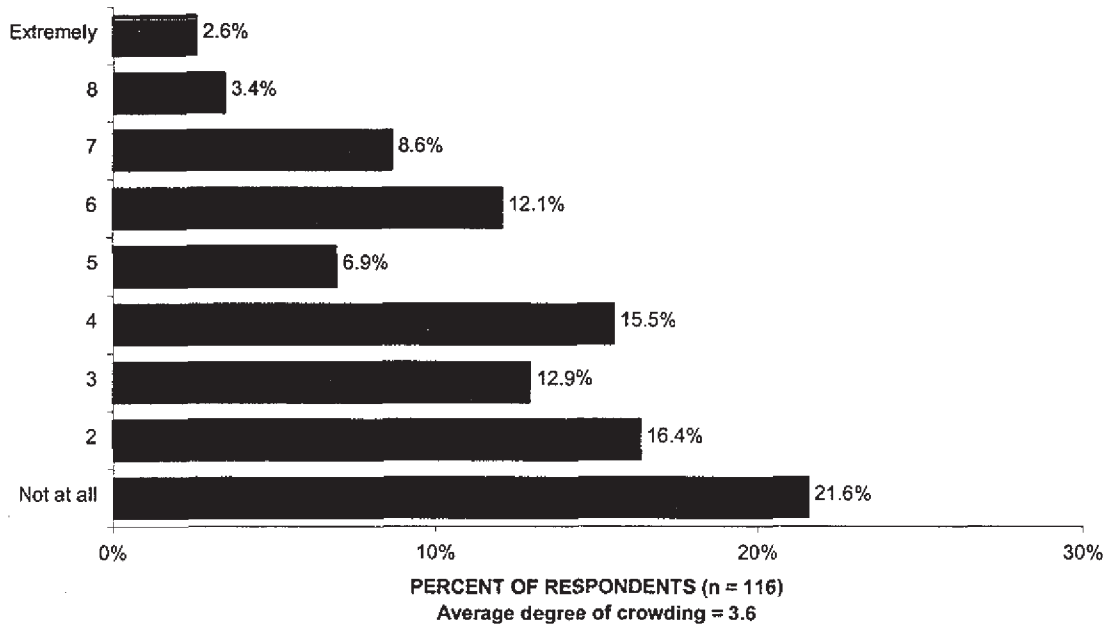
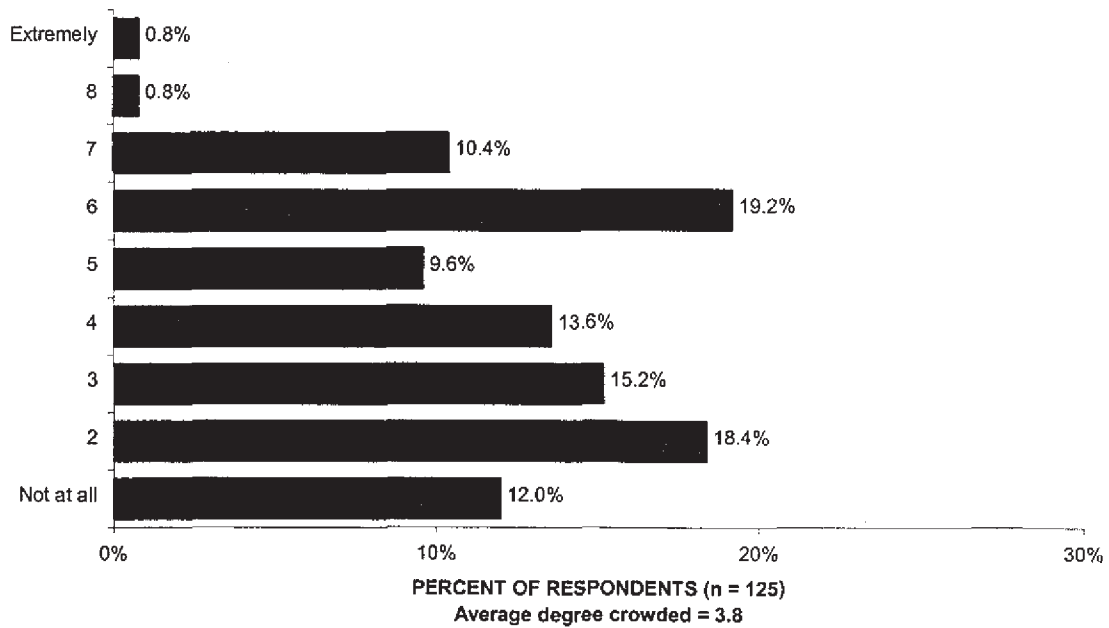


FIGURE 5.16: Q-14
DEGREE THAT THE NUMBER OF PEOPLE MADE MOUNT FREMONT RESPONDENTS FEEL
CROWDED



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FIGURE 5.17: Q-14
DEGREE THAT THE NUMBER OF PEOPLE MADE SUMMERLAND RESPONDENTS FEEL
CROWDED

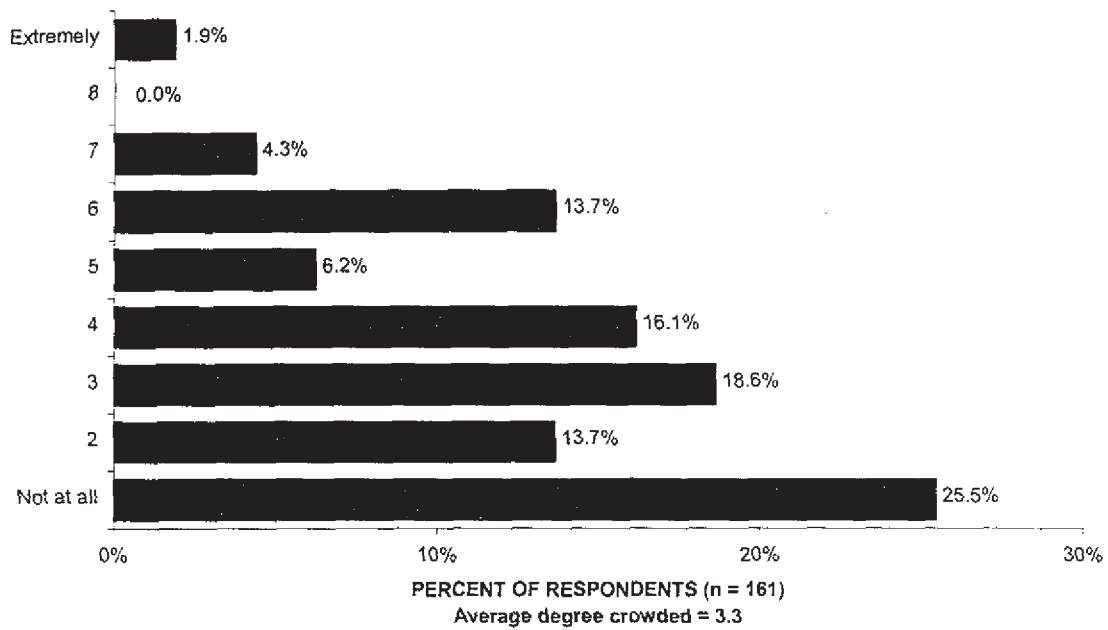
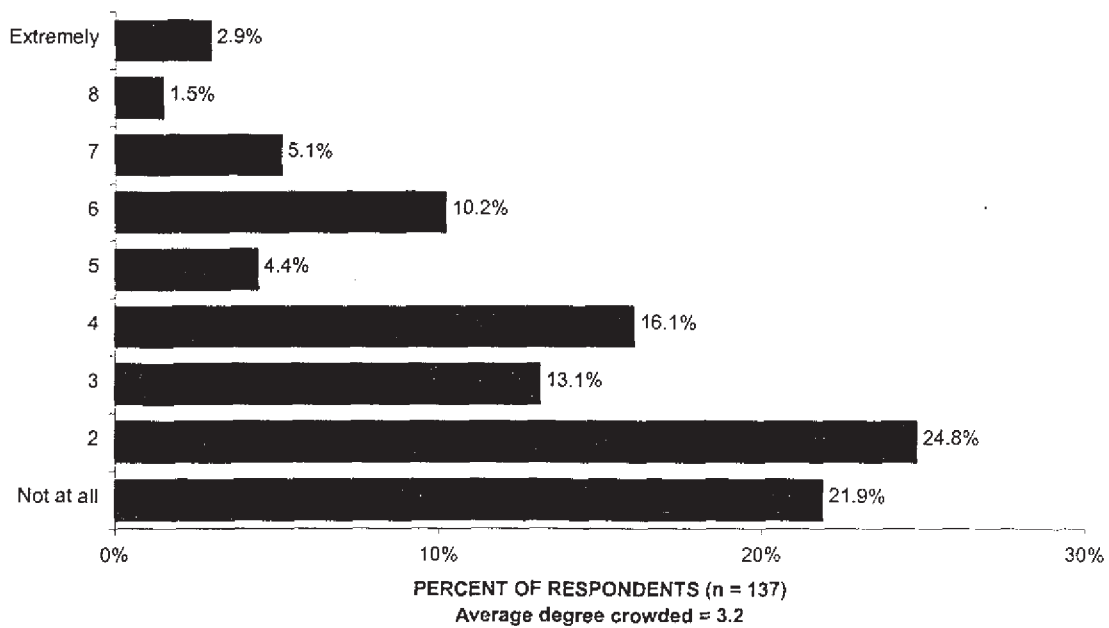


FIGURE 5.18: Q-14
DEGREE THAT THE NUMBER OF PEOPLE MADE COMET FALLS RESPONDENTS FEEL
CROWDED



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The pattern of mean ratings of degree of crowding for each contact point was consistent with the pattern found for whether other visitors' behavior detracted from respondents' experience. Respondents contacted at Mount Fremont were most likely to report other visitors' behavior detracted from their experience, and they felt the most crowded. Next highest was Glacier Basin, then Summerland, and then Comet Falls.

The 1995 Visitor Distribution Survey (VDS) documented the number of visitors to different destinations in MORA. Regression analyses provided estimates of the number of visitors on weekdays and weekends when the weather was nice and when it was poor. Table 5.1 includes the estimated number of visitors from the VDS for every contact point but Summerland which was not part of the VDS.

Table 5.1. Estimated Number of Visitors by Contact Point

Destination	Weekday		Weekend	
	Poor Weather	Nice Weather	Poor Weather	Nice Weather
Glacier Basin	53	99	111	158
Mount Fremont	17	105	128	216
Comet Falls	138	204	222	288

**From the 1995 VDS, Table 9.4*

For all sites and weather conditions, visitation estimates are higher on weekends than weekdays (see Table 5.1). This finding is consistent with increased crowding reported for visitors contacted on the weekend than for

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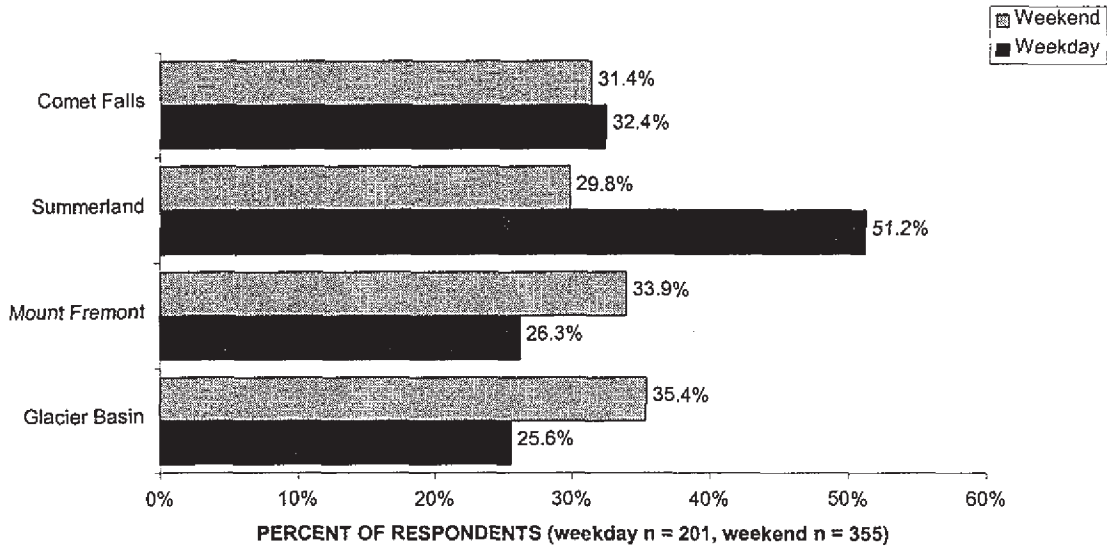
visitors contacted on the weekday²¹. Estimated visitation is highest at Comet Falls, then Mount Fremont, and lowest at Glacier Basin. This pattern, however, does not correspond to the pattern obtained for degree of crowding. More visitors does not necessarily mean more crowding when the comparison is being made across different sites. Other factors that can affect crowding such as the size of the area the people are in (i.e., visitor density) or visitor's expectations about the number of other visitors may vary as well.

Effects on Future Decisions to Visit MORA. As seen in Figure 5.19, approximately one-third (32.8%) of respondents reported that the number of other visitors they encountered would affect future decisions to visit MORA. The likelihood that future decisions would be affected varied by day of week contacted only for respondents contacted at Summerland. Half of respondents (51.2%) contacted at Summerland on weekdays reported future decisions to visit MORA would be affected, but only 29.8% of respondents contacted on weekend days reported future decisions to visit would be affected. Examination of the ways in which future decisions would be affected for respondents contacted at Summerland indicated that respondents contacted on weekdays reported being more likely to return (44.4%) than respondents contacted on the weekend (21.6%).

²¹ As noted earlier day of week contacted is not equivalent to being a weekday or weekend visitor. However, visitors contacted on the weekend are more likely to be reporting about weekend days and visitors contacted on weekdays are more likely to be reporting about weekdays.

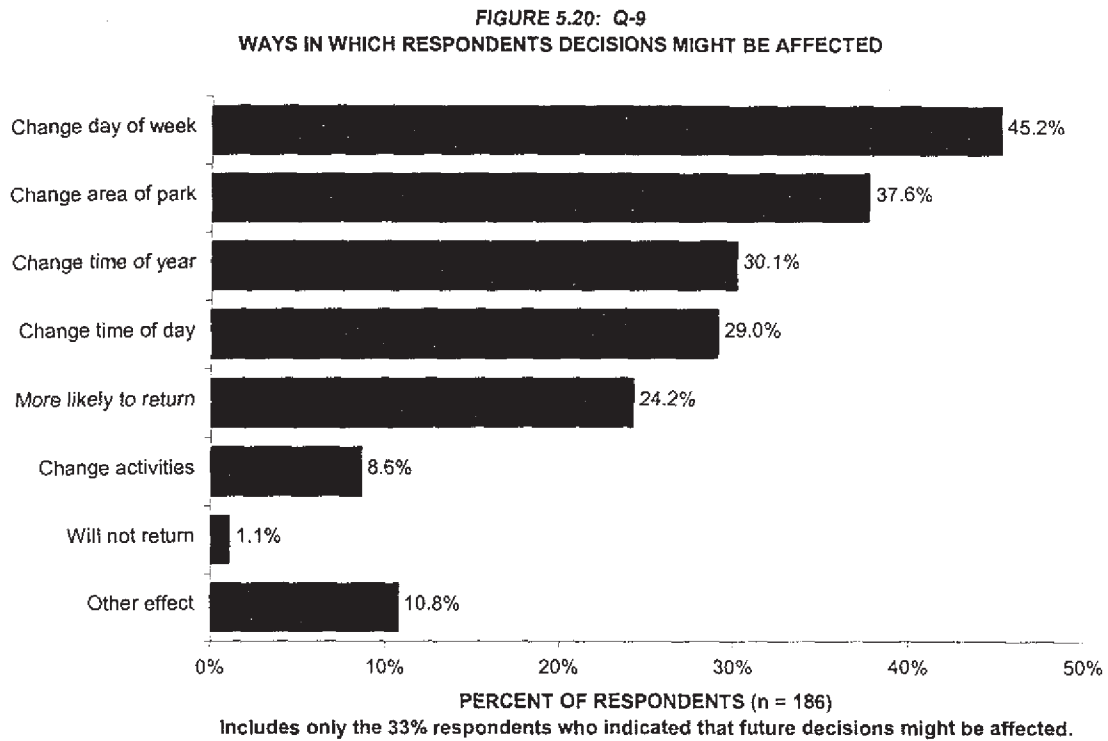
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FIGURE 5.19: Q-9
PROPORTION OF RESPONDENTS FOR WHOM THE NUMBER OF VISITORS ENCOUNTERED
WILL AFFECT FUTURE DECISIONS TO VISIT MORA



How other visitors will affect future decisions. Of those respondents who reported their future decisions would be affected, 45.2% said that they would come on a different day of the week (see Figure 5.20). The second most frequently (37.6%) reported way was to visit a different area of the park. Only 1.1% of respondents who reported their future decisions would be affected said that they would not return.

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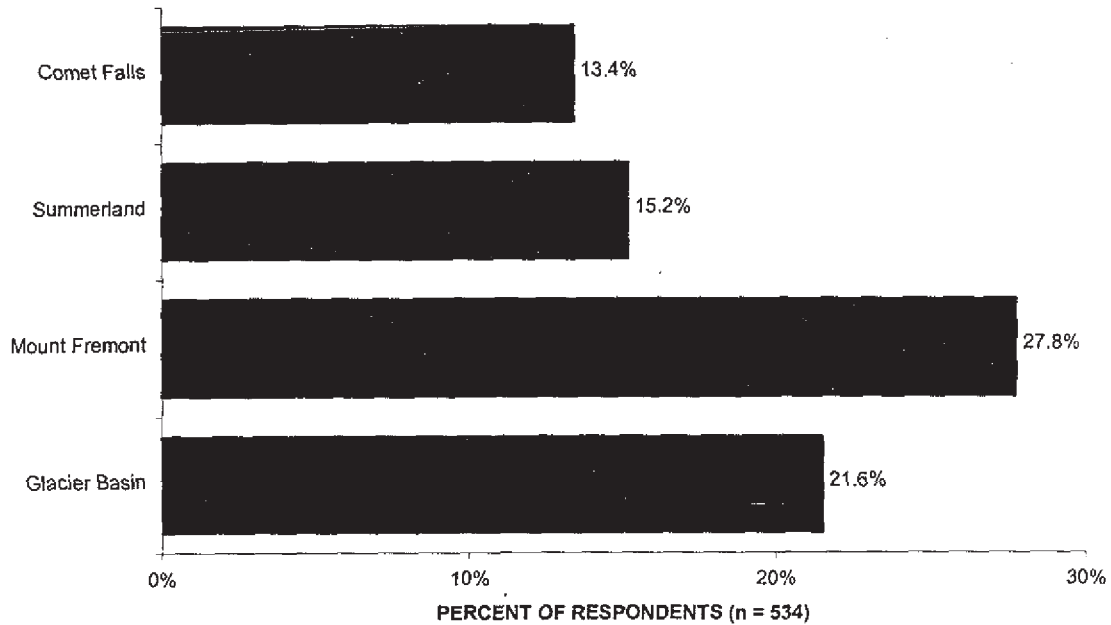


Unacceptable Visitor-caused Damage

Was damage observed? About one-fifth (19.1%) of respondents reported observing evidence that other visitors had unacceptably damaged the wilderness area that they visited. The likelihood of observing unacceptable damage varied by contact point, $\chi^2(3) = 10.94$, $p = .012$. As seen in Figure 5.21, the largest proportion of respondents reporting observing unacceptable damage were those contacted at Mount Fremont (27.8%) followed by those contacted at Glacier Basin (21.6%). Fewer respondents contacted at Summerland (15.2%) and at Comet Falls (13.4%) reported observing unacceptable damage.

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FIGURE 5.21: Q-10
PROPORTION OF RESPONDENTS WHO SAW UNACCEPTABLY DAMAGED PARK RESOURCES

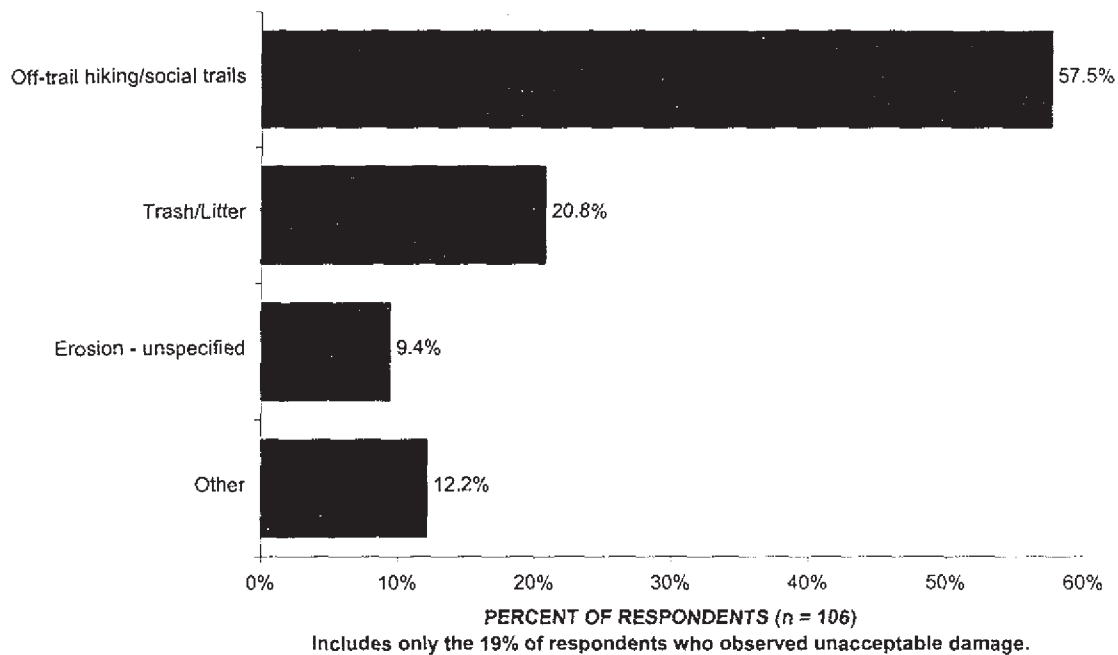


Types of damage²². Damage associated with off-trail hiking was reported by 57.6% of respondents who reported seeing unacceptably damaged park resources (see Figure 5.22). These respondents, however, comprised only 11.4% of all respondents. The presence of garbage or litter was the second most common form of unacceptable damage, being reported by only 20.8% of respondents who saw damage, or about 4.1% of all respondents.

²² Respondents generally did not specify the specific areas where they observed damage, usually stating only that it was observed where they were contacted. Thus, no analyses were done.

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FIGURE 5.22: Q-10
TYPE OF DAMAGE OBSERVED

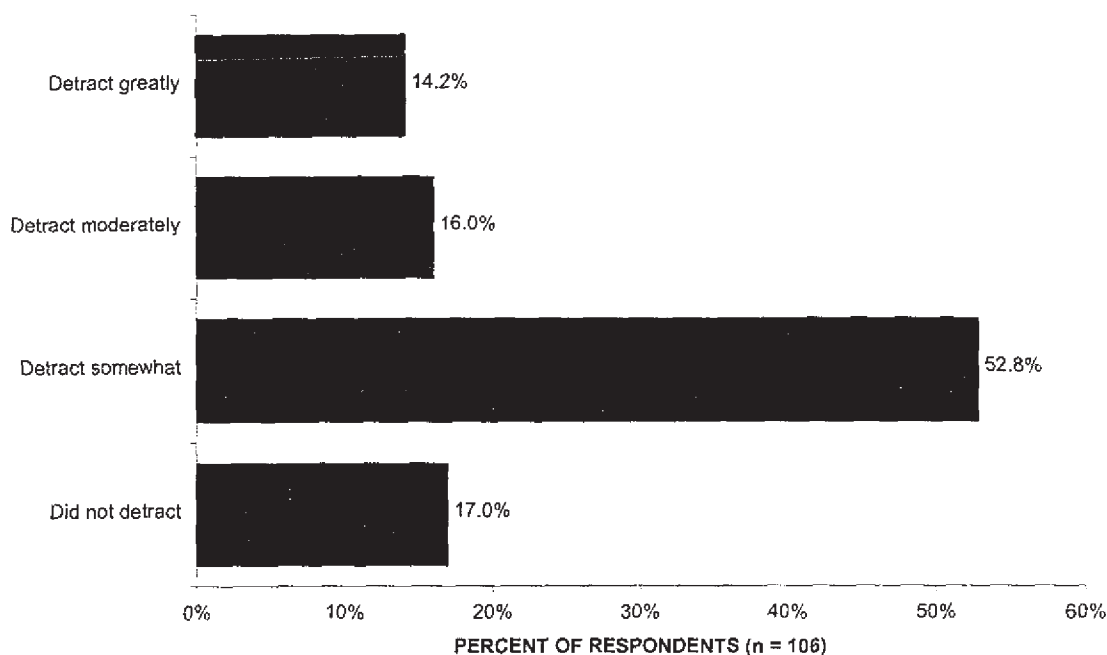


Degree to which damage detracted from experience. Over 80 percent of respondents who reported seeing unacceptable damage reported that it detracted from their enjoyment of the park (see Figure 5.23), and over half (53%) of those respondents reported that it detracted somewhat from their experience²³. In terms of all respondents, these figures indicate that about 15 percent of all respondents both saw evidence that visitors had damaged park resources and indicated that such damage detracted from their enjoyment of the park.

²³ Main effects for day of week contacted and contact point were not significant. Tests for whether day of week contacted varied for each contact point were not done because of insufficient observations.

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FIGURE 5.23: Q-10c
DEGREE TO WHICH DAMAGE DETRACTED FROM EXPERIENCE



Trip Expectations

During the initial contact, respondents were asked to select what kind of experience they expected to have during their present trip. Options included a wilderness hiking trip, a scenic hiking trip, or a social recreation trip²⁴.

A wilderness hiking trip was described as "a trip through a scenic area with little evidence of man, many opportunities for solitude, and a chance for challenge in navigating and hiking over difficult terrain."

A scenic hiking trip was described as "a trip through a scenic area with some evidence of man, fewer opportunities for solitude, and trails that show good routes through difficult terrain."

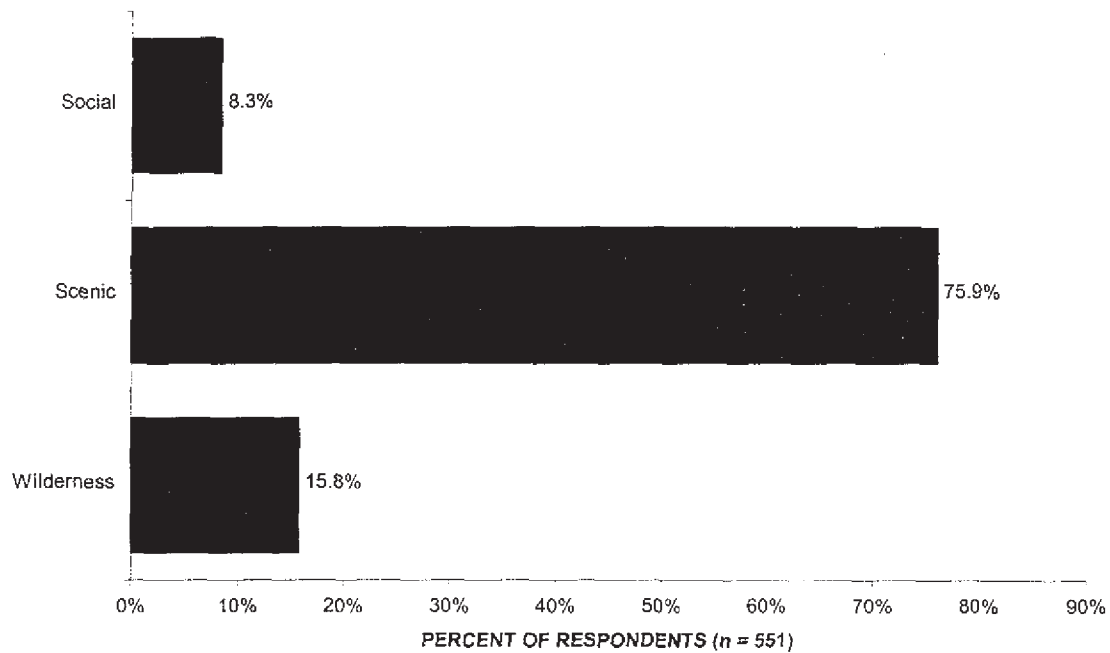
²⁴ These descriptions were based on three similar descriptions used by Roggenbuck, Williams, Bange, and Dean (1991). The descriptions vary on multiple dimensions (e.g., evidence of man, solitude, navigational challenge), but each dimension is not necessarily mentioned in each scenario.

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A social recreation trip was described as "a trip in a scenic area with much evidence of man, beautiful views of rugged terrain, and seeing other people on the trails makes the trip more fun."

As seen in Figure 5.24, 75.9% of respondents expected a scenic hiking trip, 15.8% of respondents expected a wilderness trip, and 8.3% expected a social recreation trip.

FIGURE 5.24: Contact Sheet Q-3
TYPE OF TRIP EXPERIENCE EXPECTED



Respondents were asked on the mail survey to select one of the three above types of trips to describe the kind of experience they actually had on their trip to MORA. Although no overall effect of day of week contacted was found, day of week contacted effects differed by contact point. Figures 5.25 -5.28 shows

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that although the majority (81.7%) of respondents' actual trip was a scenic hiking trip, there were some differences across contact points.

The type of trip experienced by respondents contacted at Glacier Basin did not vary significantly by day of week. Approximately 12% of respondents contacted at Glacier Basin had a wilderness hiking trip, and approximately 8% of respondents had a social recreation trip. A comparable pattern was obtained for respondents contacted at Summerland. Although the proportion of respondents contacted at Comet Falls reporting a scenic hiking trip was comparable for respondents contacted on weekdays (82.9%) and weekends (83.7%), such was not the case for the other two types of trips. Respondents contacted at Comet Falls on weekdays were more likely to report a wilderness hiking trip than a social recreation trip (15.3% vs. 1.8%, respectively), and respondents contacted at Comet Falls on weekends were more likely to report a social recreation trip than a wilderness hiking trip (11.6% vs. 4.7%, respectively).

Respondents contacted at Mount Fremont showed the greatest effect of day of week contacted on the proportion of scenic trips reported. Specifically, 84.9% of respondents contacted on weekdays had a scenic hiking trip compared to 77.2% of respondents contacted on the weekend. Although there was little difference in the proportion of wilderness hiking trips reported by respondents contacted on weekdays (7.5%) versus the weekend (5.3%), a larger proportion of respondents contacted on the weekend (17.5%) indicated their trip to be a social recreation trip than respondents contacted on weekdays (7.5%).

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FIGURE 5.25: Q-16
TYPE OF TRIP EXPERIENCE GLACIER BASIN RESPONDENTS' HAD

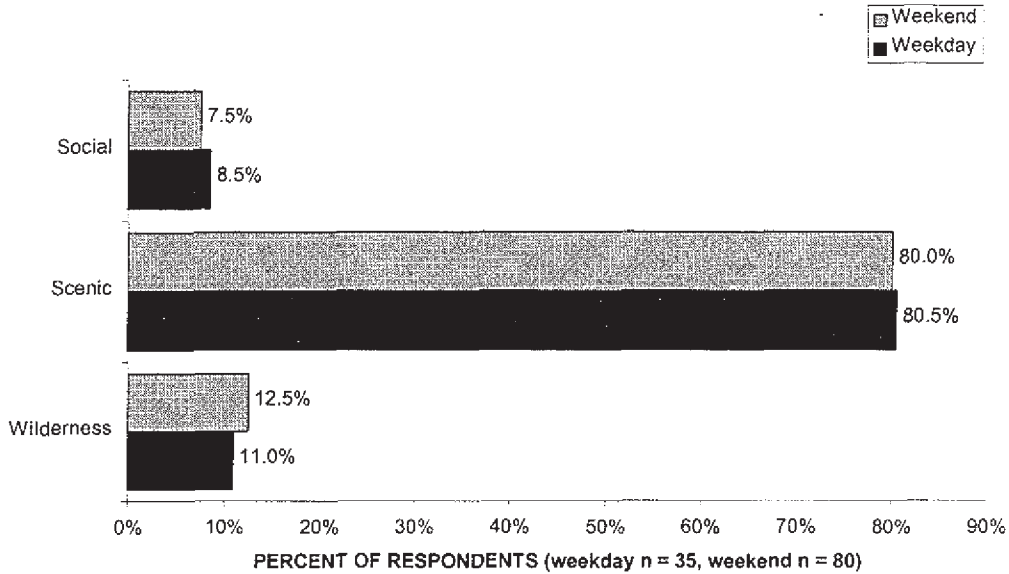
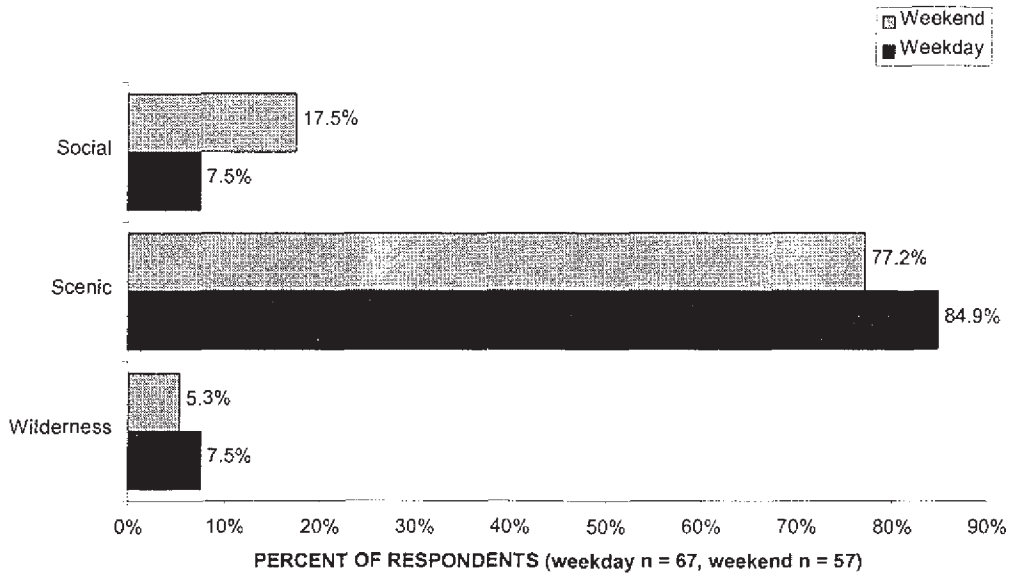


FIGURE 5.X26: Q-16
TYPE OF TRIP EXPERIENCE MOUNT FREMONT RESPONDENTS' HAD



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FIGURE 5.27: Q-16
TYPE OF TRIP EXPERIENCE SUMMERLAND RESPONDENTS' HAD

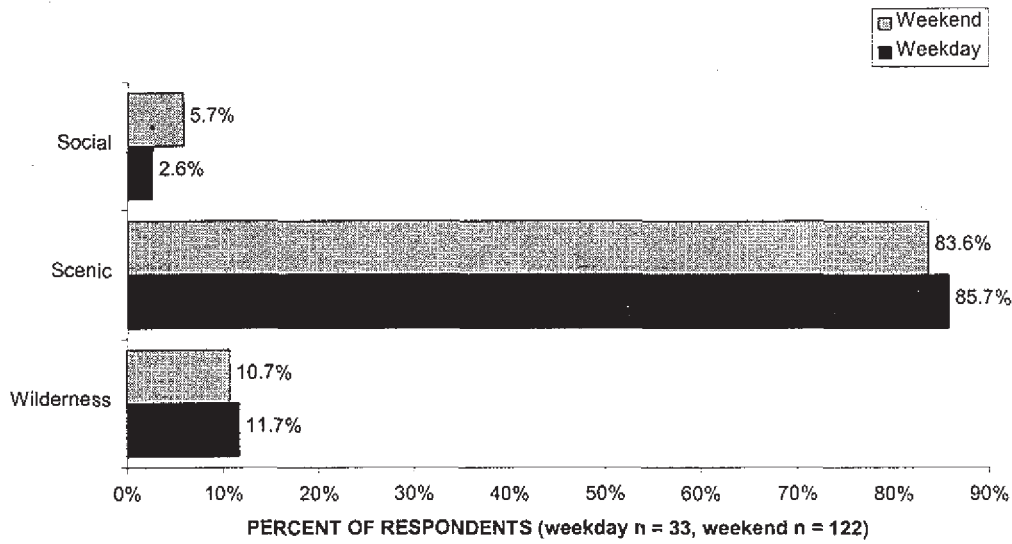
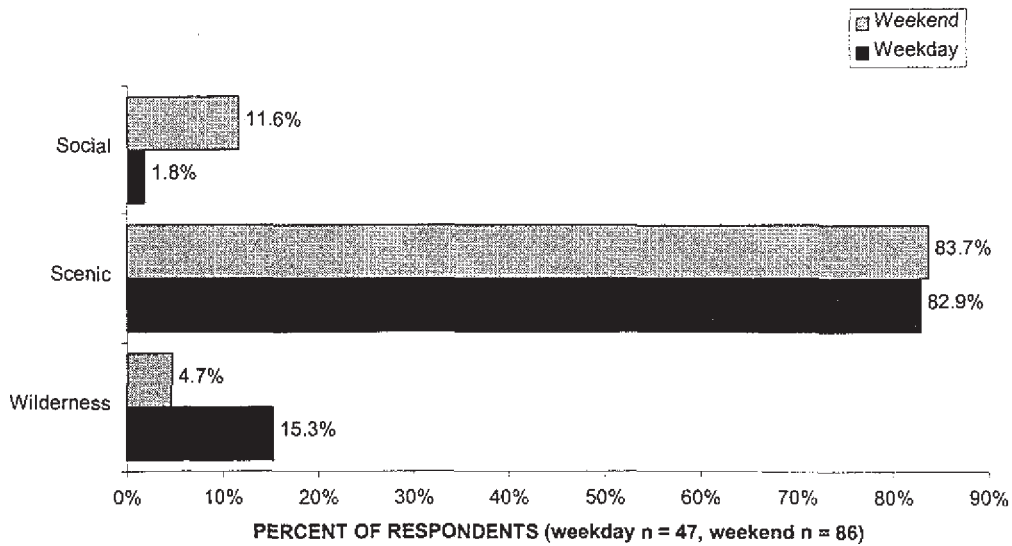


FIGURE 5.28: Q-16
TYPE OF TRIP EXPERIENCE COMET FALLS RESPONDENTS' HAD



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These contact point effects are consistent with estimated differences in visitor density for weekends and weekdays shown in the 1995 VDS (see Table 5.1 for excerpted data). Glacier Basin typically has 58 more total hikers per day entering and leaving the trail on weekends than on weekdays. Comet Falls and Mount Fremont also have more total hikers entering and leaving the trail on weekends than on weekdays (111 and 84, respectively). These increases in actual visitor density are consistent with the observed shifts described above.

Actual Trip Experience Versus Expected Experience

Although the proportion of visitors experiencing each type of trip does not differ much from the proportion of visitors expecting each type of trip, it cannot be assumed that most visitors experienced the type of trip they expected. A comparison of actual and expected trip experience for each respondent revealed that 71.0% of respondents had the type of trip they expected. As seen in Figure 5.29, a larger proportion of respondents' trip expectations were met for those expecting a social hiking trip (78.7%) than either a wilderness hiking trip (38.2%) or a social recreation trip (31.7%).

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FIGURE 5.29: Q-16 & Contact Sheet Q-3
COMPARISON OF EXPECTED AND ACTUAL TRIP EXPERIENCE

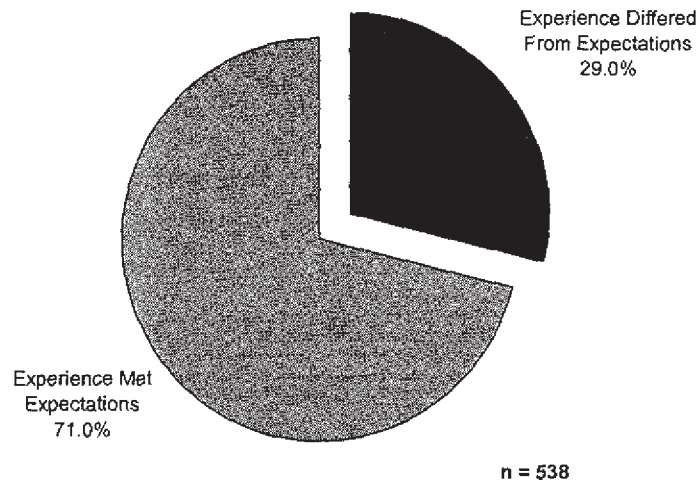
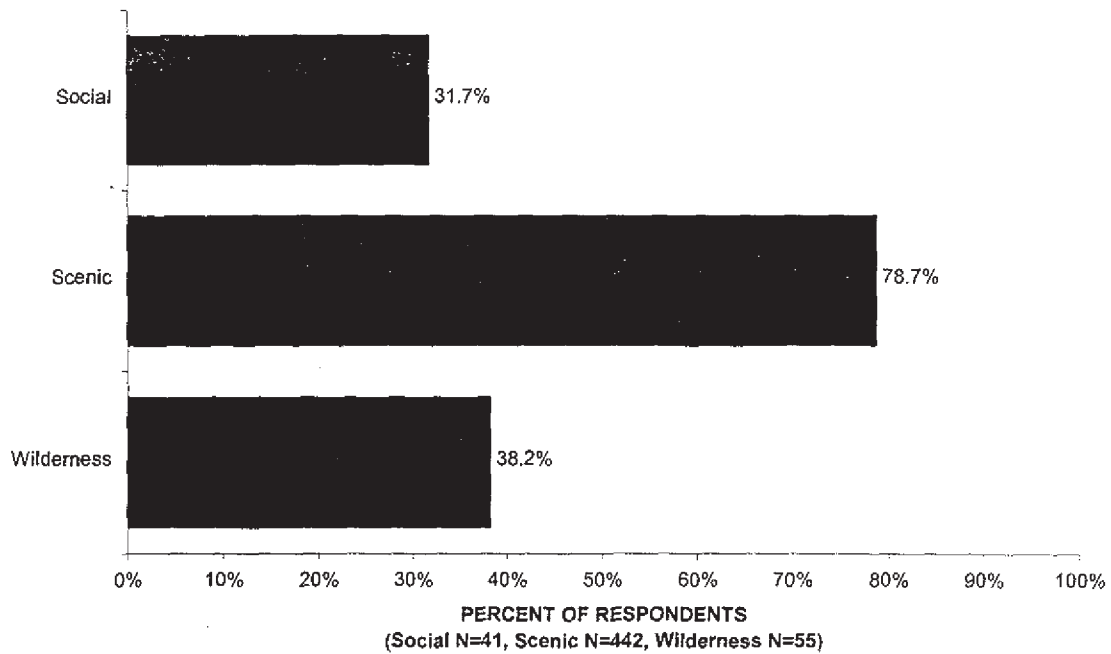


FIGURE 5.30: PROPORTION OF RESPONDENTS FOR EACH TYPE OF EXPECTED TRIP EXPERIENCE WHOSE ACTUAL TRIP EXPERIENCE MET TRIP EXPECTATIONS

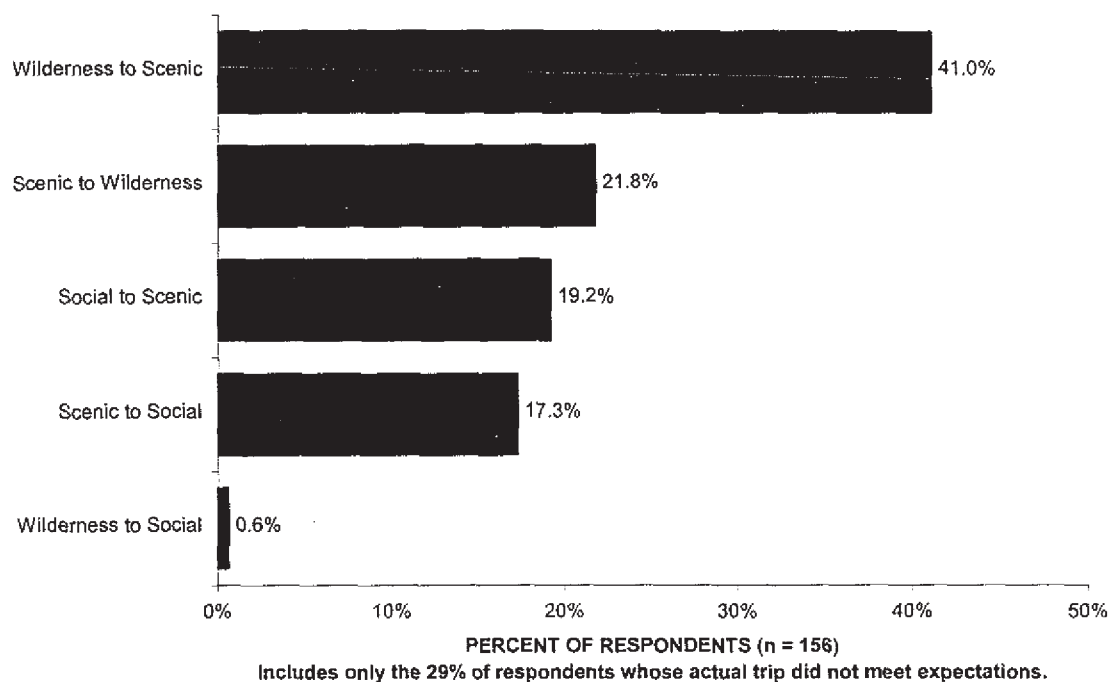


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A detailed examination of the nature of the difference between expected and actual trip experience is shown in Figure 5.31. The most common difference (41.0%) was expecting a wilderness hiking trip, but having a scenic hiking trip. The second most common difference was expecting a scenic hiking trip, but having a wilderness hiking trip (21.8%). Classifying these changes as those where respondents experienced higher densities than they expected and as those where respondents experienced lower densities than they expected revealed that 58.2% of respondents experienced higher densities than they expected and 41.8% experienced lower densities. It should be noted that these trip experience descriptions varied along other dimensions besides visitor density as discussed earlier, and it may have been one of these other dimensions that was more responsible for differences in respondents expected and actual trip experiences.

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FIGURE 5.31: TYPE OF SHIFT FROM EXPECTED TO ACTUAL TRIP EXPERIENCE

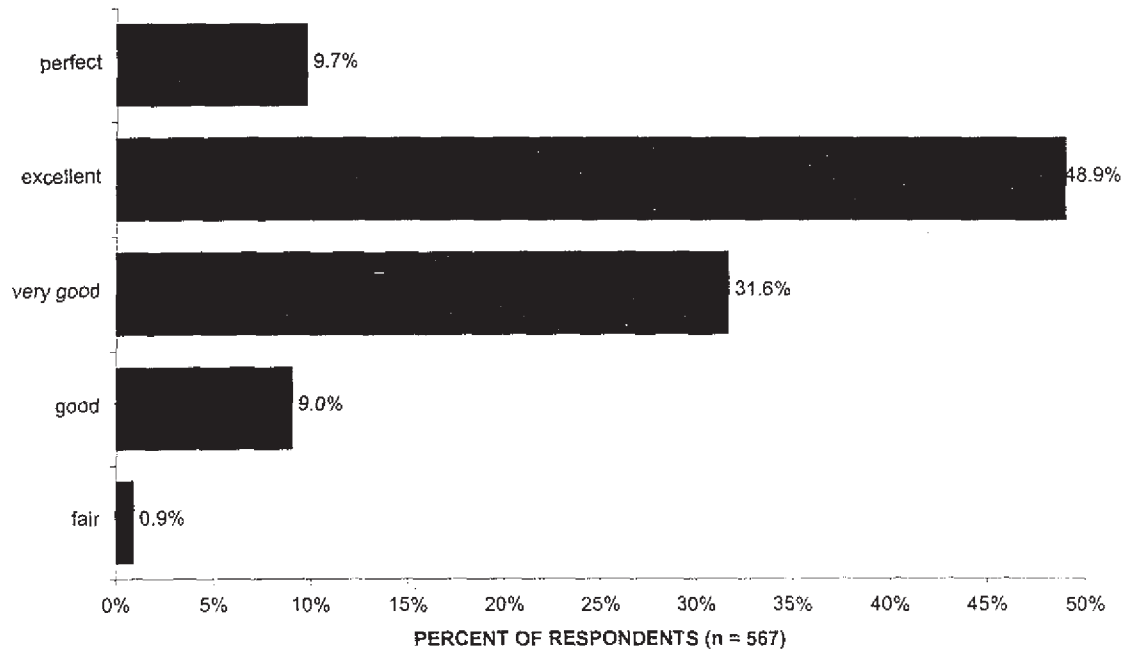


Overall Trip Satisfaction

Figure 5.32 shows that most respondents were very satisfied with their wilderness trail visit to MORA. Less than 1% rated their trip as less than *good*, and 9.7% rated their trip as *perfect*.

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FIGURE 5.32: Q-17
OVERALL RATING OF TRIP TO MORA



VI. CROWDING

The WTVS asked respondents a variety of questions related to visitor density and the effects of other visitors on their experience. This section examines these responses in relation to each other to determine the factors that combine to produce a feeling of being crowded.

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Does a single dimension corresponding to crowding underlie responses to visitor density questions?

Crowding is commonly defined as negative reactions to the number of other visitors (Manning, 1986). Being crowded is a subjective experience that depends not only on visitor density, but also on other factors such as expectations about the number of other visitors and the behavior of those visitors (Manning, 1986). To examine crowding on wilderness trails at MORA, respondents were asked a variety of questions related to visitor density. It may be that responses to these questions reflect a single underlying dimension corresponding to crowding. If such is the case, these responses can be aggregated into a single, more reliable measure of crowding that can be used to examine other variables that may predict crowding.

To determine if a single dimension was driving the observed responses on the seven questions related to visitor density (see Table 6.1 for specific questions/variables), a principal components factor analysis with varimax rotation was performed. The factor analysis revealed three independent factors with eigenvalues greater than one that explained a total of 65.4% of the variance. The first factor explained 30.8% of the variance, the second factor explained 19.7%, and the third factor explained 14.9%.

Examination of the loadings of each question on each factor provided a basis for interpreting the underlying dimension that unifies the group of variables

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loading onto it. Variables loading²⁵ onto the first factor were a) degree felt crowded by the number of other people (.81), b) preferred number of visitors match experience (.77), c) expected number of visitors match experience (.76), and d) overall rating of trip (-.55). A common element among three of the four variables was reactions to the number of other people, and the fourth corresponds to an evaluation of experience quality. This factor seems to correspond to the concept of crowding.

Table 6.1. Factor Analysis of Visitor Density Questions: All respondents

Variable		Factor		
		1	2	3
Q14	Degree felt crowded by # of other people	.81	.19	-.04
Q12	Preferred number of visitors matched experience	.77	.17	.16
Q11	Expected number of visitors matched experience	.76	-.06	-.08
Q17	Overall rating of trip	-.55	-.08	-.02
Q10	Saw unacceptable damage	.10	.81	.17
Q13	Other party's behavior detracted	.12	.80	-.19
	Shift in density from expected to actual trip description	.02	-.02	.97
	Percent of variance accounted for by factor	30.8%	19.7%	14.9%

Variables loading onto the second factor were a) saw unacceptable damage from other visitors (.81) and b) other party's behavior detracted (.80). This factor was interpreted as effects of other visitors' behavior. The third factor consisted of a single variable corresponding to shifts in visitor density between expected and actual trip descriptions (.97). Because this factor was independent of the first factor that corresponded to number of other visitors, it was unlikely

²⁵ Factor loadings less than .5 were not interpreted.

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that shifts in visitor density was the dimension underlying this factor. Although this variable was derived from shifts in visitor density, shifts in visitor density were confounded with shifts in other aspects of visitor experience whose interpretation were less clear in this context. Although three independent underlying dimensions were found, only the first factor appeared to correspond to the concept of crowding. Analyses to determine which variables predicted crowding as operationalized by this factor score were then performed (see *Predicting Crowding section below for results*).

Crowding: Type of Trip Expected

As noted earlier, crowding can be influenced by other factors including expectations. Whether one is expecting a wilderness experience or a social recreation experience may influence overall feelings of crowding by making certain aspects of visitor density more or less important. The question arose whether groups expecting different types of trip experiences have the same underlying dimension of crowding. Respondents were grouped based on the question that asked which of three types of trip best described the type of trip they were expecting: Wilderness Hiking, Scenic Hiking, or Social Recreation. A factor analysis including the same variables as the combined analysis above (see Table 6.1 for specific questions/variables) was then run for each group and the results compared.

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Expected a Wilderness Hiking Trip

A principal components factor analysis with varimax rotation was performed for respondents indicating they expected a wilderness hiking trip. The factor analysis revealed three independent factors with eigenvalues greater than one that explained a total of 72.4% of the variance. The first factor explained 28.7% of the variance, the second factor explained 24.3%, and the third factor explained 19.4%.

Table 6.2 Factor Analysis of Visitor Density Questions: Wilderness Hiking Trip

Variable		Factor		
		1	2	3
Q11	Expected number of visitors matched experience	.85	-.07	-.06
Q17	Overall rating of trip	-.72	-.24	.11
Q14	Degree felt crowded by # of other people	.72	.43	.31
Q13	Other party's behavior detracted	.09	.82	.25
Q10	Saw unacceptable damage	.18	.80	-.15
	Shift in density from expected to actual trip description	.07	.05	-.90
Q12	Preferred number of visitors matched experience	.47	.35	.59
	Percent of variance accounted for by factor	28.7%	24.3%	19.4%

Examination of the loadings of each question on each factor provided a basis for interpreting the underlying dimension that unifies the group of variables loading onto it (see Table 6.2). The variables *expected number of visitors matched experience* (.85) and *degree of crowding* (.72) loaded positively on the first factor, while *overall rating of the trip* (-.72) loaded negatively on this factor. This factor relates most closely with the concept of crowding. The second factor had the variables *others' behavior detracted* (.82) and *saw unacceptable*

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damage from visitors (.80) loading most strongly and in a positive direction. Thus, this factor corresponded to effects of other visitors. The third factor's interpretation was unclear. The variable indicating shifts between expected and actual experience had the highest loading on this factor (-.90). For this type of trip expected, this variable only has two possible values: matched (coded as 0) or moved from low to high density experience (coded as 1). The other variable that loaded positively on this factor was preferred number of visitors match experience (.59).

Expected Scenic Hiking Trip

A principal components factor analysis with varimax rotation was performed for respondents indicating they expected a scenic hiking trip. The factor analysis revealed two independent factors with eigenvalues greater than one that explained a total of 49.0% of the variance. The first factor explained 29.1% of the variance and the second factor explained 19.9%.

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Table 6.3. Factor Analysis of Visitor Density Questions: Scenic Hiking Trip

Variable	Factor	
	1	2
Q14 Degree felt crowded by # of other people	.79	.18
Q12 Preferred number of visitors matched experience	.78	.20
Q11 Expected number of visitors matched experience	.73	.03
Q17 Overall rating of trip	-.51	-.04
Q13 Other party's behavior detracted	-.10	.81
Q10 Saw unacceptable damage	.07	.80
Shift in density from expected to actual trip description	.08	.17
Percent of variance accounted for by factor	29.1%	19.9%

Examination of the loadings of each question on each factor provided a basis for interpreting the underlying dimension that unifies the group of variables loading onto it (see Table 6.3). The variables *degree of crowding* (.79), *preferred number of visitors matched experience* (.78), and *expected number of visitors matched experience* (.73) loaded positively on the first factor while *overall rating of the trip* (-.51) loaded negatively on this factor. This factor related most closely with the concept of crowding. The second factor had the variables *others' behavior detracted* (.81) and *saw unacceptable damage from visitors* (.80) loading most strongly and in a positive direction. Thus, this factor corresponded to effects of other visitors.

Expected Social Recreation Trip

A principal components factor analysis with varimax rotation was performed for respondents indicating they expected a social recreation trip. The factor analysis revealed two independent factors with eigenvalues greater than

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one that explained a total of 62.2% of the variance. The first factor explained 36.4% of the variance and the second factor explained 25.8%.

Table 6.4. Factor Analysis of Visitor Density Questions: Social Recreation Trip

Variable	Factor	
	1	2
Q12 Preferred number of visitors matched experience	.87	.16
Q14 Degree felt crowded by # of other people	.86	.17
Q11 Expected number of visitors matched experience	.85	.09
Q13 Other party's behavior detracted	.28	.83
Shift in density from expected to actual trip description	.28	-.71
Q10 Saw unacceptable damage	.23	.56
Q17 Overall rating of trip	-.35	-.49
Percent of variance accounted for by factor	36.4%	25.8%

Examination of the loadings of each question on each factor provided a basis for interpreting the underlying dimension that unifies the group of variables loading onto it (see Table 6.4). The variables *preferred number of visitors matched experience* (.87), *degree of crowding* (.86), and *expected number of visitors matched experience* (.85) loaded positively on the first factor. This factor related most closely with the concept of crowding. The second factor had the variables *others' behavior detracted* (.83) and *saw unacceptable damage from visitors* (.56) loading most strongly on it in a positive direction. The variable indicating shifts between expected and actual experience (-.71) loaded negatively on this factor. For social recreation trips, the variable corresponding to shifts in expected and actual experience only has two possible values: moved from high to low density (coded as -1) or matched (coded as 0). Although it was

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unclear what the variable related to shifts was capturing, this factor appeared to correspond to effects of other visitors.

Comparison of Findings for each Type of Expected Trip

Factor analysis of visitor density questions for each type of expected trip revealed a crowding factor and an effects of other visitors factor for each type of trip expected. For respondents expecting a wilderness trip, a third factor emerged whose interpretation was unclear. Although obtained factors were interpreted similarly across types of expected trips, the variable loadings differed somewhat by type of group.

Factor 1: Crowding. Table 6.5 summarizes the variable loadings for each type of expected trip on the crowding factor. Review of the table showed similar loadings for each type of expected trip on all but two variables. First, overall trip rating loaded strongly (-.72) on the crowding factor for expected wilderness hiking trip respondents, moderately (-.51) for expected scenic hiking trip respondents, and weakly (-.35) for expected social recreation trip respondents. This finding suggests that crowding was reflected in overall trip satisfaction as a function of type of trip expected. Specifically, as type of trip expected involved more other visitors, the less overall trip satisfaction was negatively related to crowding.

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Table 6.5. Comparison of Loadings on Crowding Factor for Type of Expected Trip

Variable	Type of Expected Trip		
	Wilderness Hiking n = 87	Scenic Hiking n = 418	Social Recreation n = 46
Q11 Expected number of visitors matched experience	.85	.73	.85
Q17 Overall rating of trip	-.72	-.51	-.35
Q14 Degree felt crowded by # of other people	.72	.79	.86
Q13 Other party's behavior detracted	.09	-.10	.28
Q10 Saw unacceptable damage	.18	.07	.23
Shift in density from expected to actual trip description	.07	.08	.28
Q12 Preferred number of visitors matched experience	.47	.78	.87

Second, preferred number of other visitors matched experience loaded strongly on crowding for expected scenic hiking trip respondents and expected social recreation trip respondents (.78 and .87, respectively) and moderately for expected wilderness trip respondents. This finding suggests that discrepancies between preferences and actual experience were less related to crowding for expected wilderness hiking trip respondents than the other two types of expected trips²⁶. Prior experience at MORA does not differ across the three types of expected trips and, therefore, can not explain the observed pattern. It is unclear why discrepancies between preferred and actual number of visitors is less strongly related to crowding for respondents expecting a wilderness trip than those expecting either a social recreation or scenic hiking trip.

Factor 2: Effects of Other Visitors. Table 6.6 summarizes the variable loadings for each type of expected trip on the effects of other visitors factor. Review of the table showed that there was less consistency among variables

²⁶ This reduced effect is not due to lower variability in crowding or preferences for the wilderness trip respondents than the other two trip types.

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loadings on this factor than on the crowding factor for the different types of expected trips. First, the variable *saw unacceptable damage from other visitors* loaded strongly for expected wilderness hiking trip respondents and for scenic hiking trip respondents (.80 and .80, respectively), but only moderately (.56) for expected social recreation trip respondents. This finding suggests that direct (e.g., other party's behavior detracted) and indirect (e.g., saw unacceptable damage) effects of other visitors were related for respondents expecting either a scenic hiking trip or a wilderness hiking trip, but not for respondents expecting a social recreation trip.

Table 6.6. Comparison of Loadings on Effects of Other Visitors Factor for Type of Trip Expected

Variable	Type of Expected Trip		
	Wilderness Hiking n = 87	Scenic Hiking n = 418	Social Recreation n = 46
Q11 Expected number of visitors matched experience	-.07	.63	.09
Q17 Overall rating of trip	-.24	-.04	-.49
Q14 Degree felt crowded by # of other people	.43	.18	.17
Q13 Other party's behavior detracted	.82	.81	.83
Q10 Saw unacceptable damage	.80	.80	.56
Shift in density from expected to actual trip description	.05	.17	-.71
Q12 Preferred number of visitors matched experience	.35	.20	.16

Second, overall trip satisfaction rating loaded moderately (-.49) on the effects of other visitors factor for respondents expecting a social recreation trip, but not for respondents expecting the other two types of trips. This loading pattern suggested that overall trip satisfaction ratings were related to the effects of other visitors only for respondents expecting a social recreation trip.

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Third, the variable corresponding to shifts in density between expected and actual type of trip loaded strongly (-.71) for expected social recreation trip respondents, but not at all for the other two types of expected trips. As noted earlier, however, it was unclear what this variable was capturing and it cannot be interpreted.

Last, for respondents expecting a wilderness trip, degree of crowding loaded moderately (.43) with effects of other visitors, but only weakly (.17 & .18) for the other two types of expected trips. This finding for respondents expecting a wilderness hiking experience, in conjunction with the findings for the crowding factor, suggests that crowding ratings such as the degree of crowding question asked of persons expecting a wilderness trip may reflect two kinds of effects of other visitors: 1) effects due to number of other visitors and 2) effects of other visitors behavior. In contrast, crowding ratings of respondents expecting a scenic hiking trip or a social recreation trip reflect only effects due to number of other visitors.

Summary. Overall, effects due to the number of other visitors (crowding) were found to be independent of effects of other visitors' behavior for all three types of expected trips. The differences noted in the individual variable loadings on each factor suggested that respondents with different expectations do vary somewhat in what aspects of visitor density correspond to the concepts of crowding and effects of other visitors' behavior. These findings provided initial evidence that different aspects of visitor density correspond to crowding depending on the type of trip experience expected. When setting park policy,

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management should realize that in the process of modifying the types of trips people expect, different aspects of visitor density will have greater impact on the experience of being crowded.

Predicting Crowding: Using the Crowding Factor Score

To determine which variables predicted crowding, the factor score corresponding to the first factor in the combined analysis²⁷ was computed for each respondent and used as the measure of crowding. The distribution of these crowding factor scores revealed them to be normally distributed and, therefore, a regression analysis approach was adopted to determine which variables predicted crowding.

²⁷ The combined analysis was used for two reasons. First, although variable loadings differed somewhat by type of expected trip, factors were interpreted to represent the same constructs. Second, 76% (413 out of 542) of respondents were expecting scenic hiking trips. Thus, the combined factor analysis and this regression analysis will reflect the greater proportion of respondents expecting a scenic hiking trip.

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Table 6.7. Predictor Variables

Predictor variables		
Sex	Sought information	Distance hiked
Age	Number of trips to MORA in past three years	Time spent hiking
Years of education	Aware of wilderness mandate	Hiking speed
Employment status	Aware of solitude mandate	Left the trail
Resides in Washington	Type of trip expected	Contact point (6 variables)
Party size	Difference in density between expected trip & actual trip	
Children < 16 years old in party	Type of destination (3 variables)	
Day of week contacted		
Type of group (4 variables)		

As crowding may depend on characteristics of the individual and/or characteristics of the trip, variables corresponding to either were included as predictor variables (see Table 6.7 for complete list). Variables that were used in the calculation of the crowding factor score were excluded from the predictor list. Forward stepwise²⁸ regression was used to develop the model that best predicted crowding using some or all of these variables. Results indicated that the best fitting model consisted of four variables and explained a total of 7.7% of

²⁸ Criteria for including a variable was an F value that was significant at the .05 level, and criteria for excluding a variable was an F value that was significant at the .10 level.

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the variance in crowding. Table 6.8 summarizes the four variables included in the final model.

Table 6.8 Variables Predicting Crowding as Measured by Factor Score

Variable ^a	Unstandardized Coefficients		β	<i>t</i>	<i>p</i>
	<i>b</i>	Std. Error			
Day of week contacted	.451	.107	.220	4.22	<.001
Contacted at Mt. Fremont	.316	.190	.138	2.66	.008
Distance hiked (miles)	-.042	.018	-.121	-2.39	.017
Group of Family & Friends	-.337	.152	-.113	-2.22	.027

^a Variables are listed in the order in which they were selected to be entered by the forward stepwise regression.

First, respondents contacted on the weekend reported being more crowded than respondents contacted on weekdays holding all other variables in the equation constant, $\beta=.22$, $t(362)=4.22$, $p < .001$. Although day of week contacted is not equivalent to day of visit (i.e., weekend versus weekday visitor), it is likely that as a group, visitors contacted on the weekend were more likely reporting about weekend days and visitors contacted on weekdays were more likely reporting about weekdays. If anything, day of week contacted should underestimate the effect expected when comparing weekend versus weekday visitors. The magnitude of this underestimation depends on the extent that visitors contacted on the weekdays reported about experiences happening on weekend days and visitors contacted on weekends reported about experiences happening on weekdays. Given that the 1995 Visitor Distribution Survey (VDS) documented that visitor density on trails at MORA is higher on weekend days

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than weekdays²⁹ and changes in visitor density would be expected to have a direct effect on crowding, it was reasonable to interpret day of week contacted as capturing differences in visitor density for weekend days versus weekdays.

Second, respondents contacted at Mount Fremont reported being more crowded than respondents contacted at the other contact points holding all other variables in the equation constant, $\beta=.14$, $t(362)=2.67$, $p=.008$. This difference may be due to the open terrain at Mount Fremont that enables hikers to see other visitors for long periods of time and not just when they pass each other on the trail. Additionally, views from the Mount Fremont trail allow hikers to see hikers on other trails such as the Burroughs Mountain trail. The terrain at the other three contact points was less open, and therefore, other visitors were encountered for relatively short periods of time.

Third, the greater number of miles hiked the less crowded respondents reported feeling, holding all other variables in the equation constant, $\beta= -.12$, $t(362)=-2.39$, $p=.017$. Because the trails included in the WTVS were out and back trails rather than loops, this finding suggested that visitor density was higher nearer the trailhead and thinned out the further one went along the trail. Although the trail as a whole may be designated or zoned as a particular type of experience, this finding suggests that type of experience may vary as a function of distance hiked. Thus, when using visitor density measures in the process of designating zones to capture particular types of experience, it is important to

²⁹ Visitor density was higher on weekends than weekdays for each of the three WTVS contact points (Comet Falls, Mount Fremont, and Glacier Basin) included in the VDS.

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consider how those measures correspond to different points along the trail (e.g., Are visitors counted at the trailhead? At the furthest point of the trail?).

Fourth, respondents who were part of a group of family and friends reported feeling less crowded than respondents from other types of groups holding the three other variables constant, $\beta = -.11$, $t(362) = -2.22$, $p = .027$. Although party size for groups of family and friends ($M = 4.66$, $SD = 2.06$) was significantly greater than for the other groups ($M = 2.69$, $SD = 1.06$)³⁰, $t(557) = -9.94$, $p < .001$, if party size alone was the determining factor, then the variable for party size would have been included in the final solution. It is unclear what other characteristic(s) associated with groups of family and friends is driving this effect.

Although four variables were found to significantly predict crowding, they only explained a small percentage (7.7%) of the variance in crowding. It should be noted that none of the variables in the model corresponded to expectations or preferences that have historically been found to be strong predictors of crowding. This result occurred because the crowding factor score included variables that incorporated people's expectations (expected number of visitors matched experience) and preference (preferred number of visitors matched experience) and thus, they could not be used as predictor variables. The fact that these variables loaded on the same factor as degree of crowding indicated that these variables were highly related, consistent with prior research.

³⁰ Mean party size for each group type follow: Family, $M = 2.81$; Friends, $M = 2.73$; Other, $M = 2.03$.

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Predicting Crowding: Using Degree of Crowding

More analogous to what is traditionally done in the literature, a second forward stepwise regression analysis was performed using degree of crowding as the dependent variable. In addition to the predictor variables included in the prior analysis (see Table 6.7 for list), expected number of visitors matched experience and preferred number of visitors matched experience were included as predictor variables.

Results indicated that the best fitting model consisted of eight variables and explained 49.0% of the variance in degree of crowding. Table 6.9 summarizes the eight variables included in the final model.

Table 6.9 Variables Predicting Degree of Crowding

Variable ^a	Unstandardized Coefficients		β	<i>t</i>	<i>p</i>
	<i>b</i>	Std. Error			
Preferred number of visitors match experience	1.357	.130	.443	10.42	<.001
Expected number of visitors match experience	.729	.109	.286	6.70	<.001
Day of week contacted	.621	.171	.143	3.64	<.001
Contacted at Mt. Fremont	.684	.201	.140	3.40	.001
Level of schooling (years)	.067	.028	.093	2.38	.018
Age on mail survey	-.021	.007	-.115	-2.86	.004
Contacted at Summerland	.443	.189	.097	2.34	.020
Aware of solitude mandate ^b	-.373	.162	-.089	-2.31	.021

^a Variables are listed in the order in which they were selected to be entered by the forward stepwise regression.

^b Respondents aware of the solitude mandate were coded as 1 and those not aware of the mandate were coded 2.

Respondents reported feeling increasingly crowded as the actual number of visitors exceeded their preferred number of visitors to a greater extent, $\beta = .44$,

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$t(361)= 10.42, p<.001$. Also, respondents reported feeling increasingly crowded as the actual number of visitors exceeded their expected number of visitors to a greater extent, $\beta= .29, t(361)= 6.70, p<.001$. Together these two variables explained 43.5% of the total variance in degree of crowding. This pattern of findings was consistent with prior research (c.f., Johnson, 1989; Glacier Bay National Park Tour Boat Passenger Visitor Survey).

Day of week contacted and contacted at Mount Fremont emerged again as significant predictors of crowding. Their relationships with degree of crowding were the same as with the crowding factor score so they are not discussed again.

The remaining four variables together explained 2.8% of the variance and the most variance any one of them explained was 0.8%. Only the relationship between awareness of the solitude mandate and degree of crowding was easily interpretable. Respondents who were aware of the solitude mandate were more crowded than those not aware of the mandate, $\beta= -.09, t(361)= -2.31, p=.021$. The relationship between the remaining three variables and degree of crowding was more complex and not immediately apparent. First, the more years of schooling respondents had the more crowded they reported feeling holding the 7 other variables constant, $\beta= -.09, t(361)= 2.38, p=.018$. Second, respondents contacted at Summerland reported feeling more crowded than respondents contacted elsewhere holding the 7 other variables constant, $\beta= .10, t(361)= 2.34, p=.020$. Third, the older respondents were the less crowded they reported

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feeling, holding the 7 other variables constant, $\beta = -.12$, $t(361) = -2.86$, $p = .004$.

The combination of complexity and limited predictive ability suggests that pursuing these variables would not be an efficient or effective means for management to reduce crowding.

Summary. This model showed that variables reflecting actual number of visitors versus expected number of visitors and preferred number of visitors were strong predictors of degree of crowding explaining 43.5% of total variance. Six additional variables were found to explain 5.5% of the total variance in degree of crowding. These findings suggest that management would be best served by focusing on understanding how visitor preferences and expectations affect the experience of being crowded, and by using this knowledge as a basis for establishing park policy.

VII. DISPLACEMENT

The WTVS asked respondents a variety of questions concerning acceptable substitute destinations for the trail where they were contacted for the survey. This section reports whether acceptable substitute destinations existed and what they were.

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Availability of an Acceptable Substitute Destination

Respondents were asked, "If, prior to your trip, you had been notified that the trail(s) at the site where you were contacted for this survey were filled to capacity and you were not able to go there, would there have been an acceptable substitute destination for you to visit instead?" Over three-quarters (81.0%) of respondents reported that an acceptable substitute destination was available (see Figure 7.1). Of those respondents indicating that an acceptable destination existed, about half listed at least one specific substitute destination in MORA. Only 1.6% indicated that none of the acceptable substitute destinations were in MORA (see Figure 7.2). Just under half (48.5%) of respondents who would accept an alternative indicated that they would need to be informed of alternatives.

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FIGURE 7.1: Q-15
IF NOTIFIED DESIRED DESTINATION WAS FILLED TO CAPACITY, WOULD THERE HAVE BEEN AN ACCEPTABLE SUBSTITUTE?

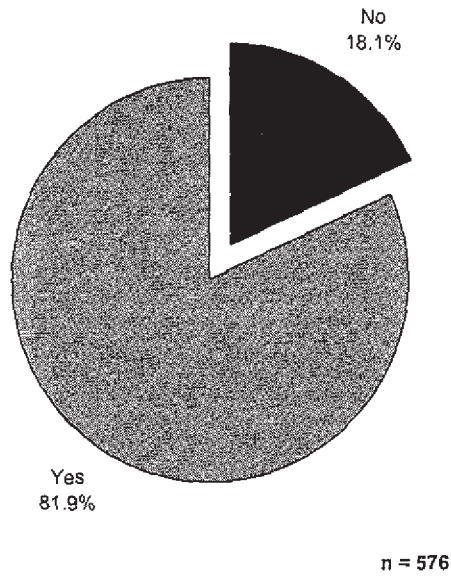
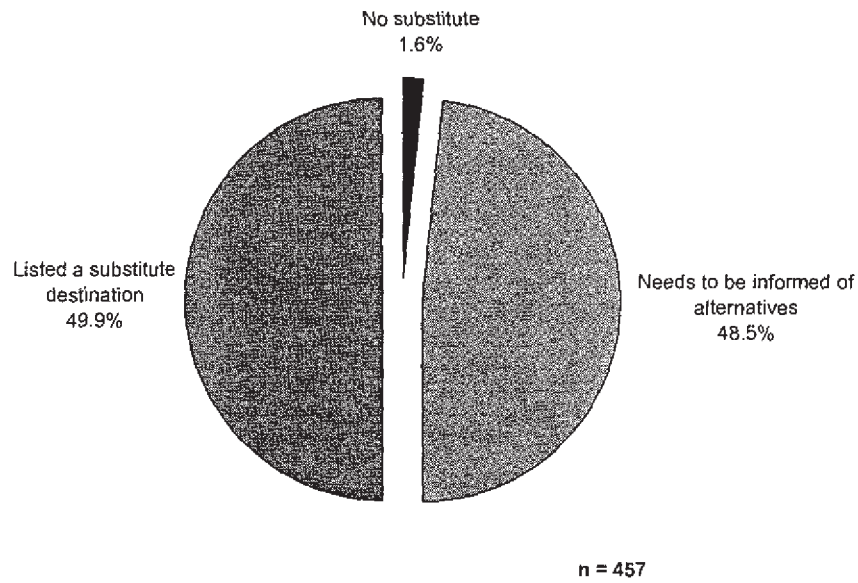


FIGURE 7.2: Q-15
DOES AN ACCEPTABLE SUBSTITUTE DESTINATION INSIDE MORA EXIST?



Includes only the 81.9% of respondents indicating an acceptable substitution exists.

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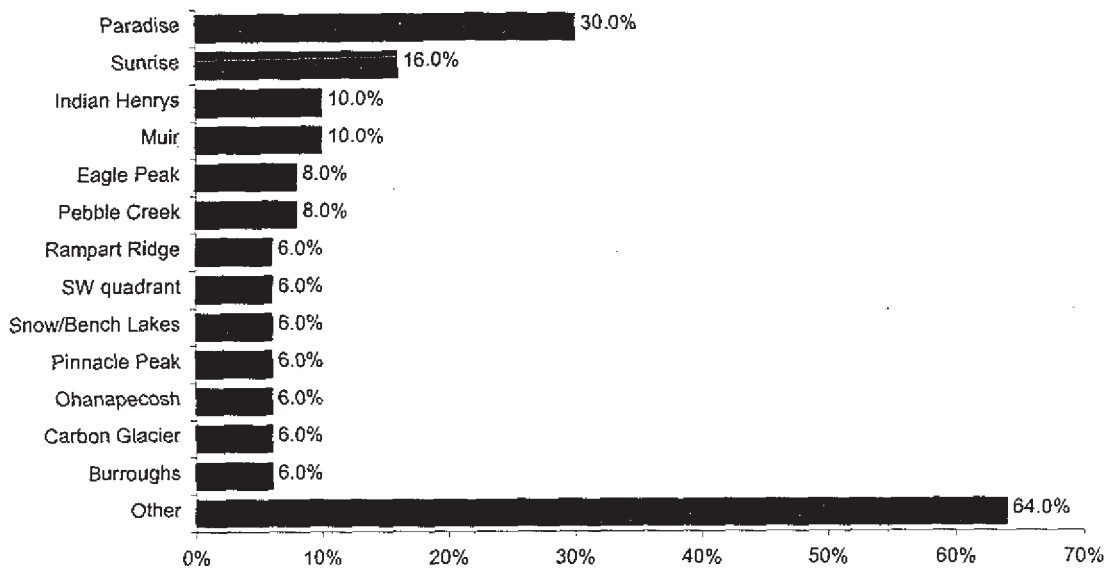
Acceptable Substitute Destinations in MORA

Respondents were allowed to list up to three acceptable substitutes in MORA. No significant effects of day of week contacted or contact point were obtained. Data, however, are presented for each contact point to maximize interpretability.

Comet Falls Respondents' Acceptable Substitutes. The most commonly listed substitute destination was Paradise (30.0% of respondents contacted at Comet Falls) followed by Sunrise (16.0% of respondents contacted at Comet Falls). These destinations provide a wide range of alternative experiences, and it is impossible to know which specific hike, if any, respondents were referring to when listing these destinations. One difference between Comet Falls and these two destinations is that Sunrise and Paradise are subject to higher visitor density than is found at Comet Falls. Indian Henry's Campground and Camp Muir were acceptable substitute destinations listed by 10% of respondents contacted at Comet Falls. These destinations involve longer, more strenuous hikes and have a lower visitor density than Comet Falls. Review of Figure 7.3 shows that many of the acceptable substitute destinations for Comet Falls were geographically close to Comet Falls with the exception of those around Sunrise.

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FIGURE 7.3: Q-15
SUBSTITUTE DESTINATIONS IN MORA FOR COMET FALLS RESPONDENTS

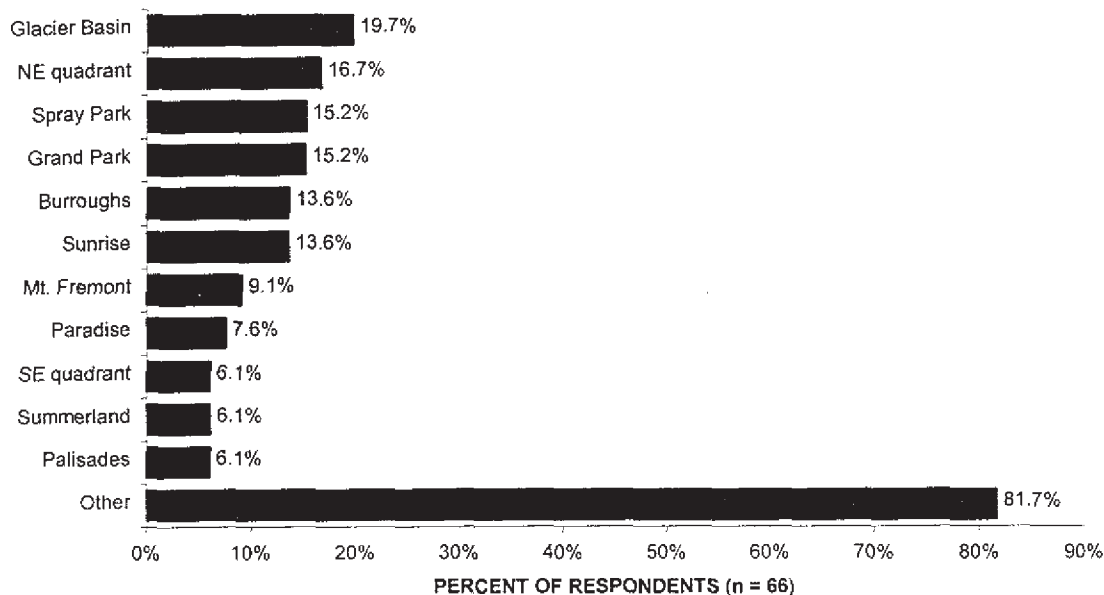


PERCENT OF RESPONDENTS (n = 50)
Includes only the respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

Summerland Respondents' Acceptable Substitutes. As seen in Figure 7.4, six destinations were listed by approximately 13% to 20% of respondents. Examination of these destinations suggest that acceptable substitute destinations fall into two general classes. The first class are hikes that are geographically close to Summerland. Glacier Basin (19.7%), Burroughs (13.6%), Sunrise (13.6%), and hikes in the NE quadrant (16.7%) were frequently listed as acceptable destinations even though the terrain for most of these destinations differs from that found at Summerland. The second class are hikes that have comparable terrain to Summerland. Grand Park (15.2%) and Spray Park (15.2%) were, not surprisingly, frequently listed as acceptable substitute destinations even though they are considerably further from Summerland.

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FIGURE 7.4: Q-15
SUBSTITUTE DESTINATIONS IN MORA FOR SUMMERLAND RESPONDENTS



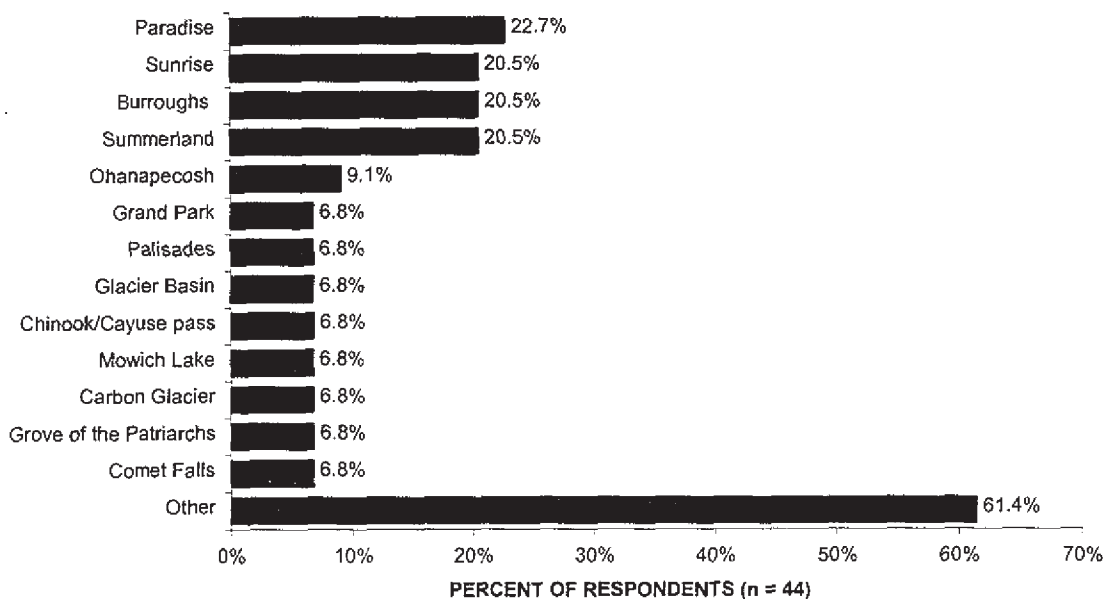
Includes only the respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

Mount Fremont Respondents' Acceptable Substitutes. As seen in Figure 7.5, there were four acceptable substitute destinations listed by more than 20% of Mount Fremont respondents. With the exception of Paradise (22.7%), the other three destinations (Sunrise, Burroughs Mountain, & Summerland; each listed by 20.5% of respondents) are geographically close to Mount Fremont. In addition, a number of other listed destinations are geographically close to Mount Fremont (Grand Park, Palisades, Glacier Basin, & Chinook/Cayuse Pass; each listed by 6.8% of respondents) suggesting that geographic proximity was important in selecting an acceptable alternative. Paradise and Sunrise offer a wide variety of experiences and it is unclear which hiking experience respondents were indicating when listing Paradise or Sunrise. Thus, making

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inferences about what aspects of these hikes were important in their selection as an acceptable alternative cannot be made. The variety of hiking experiences represented by the other acceptable destinations suggests that an acceptable substitute for the hike to Mount Fremont need not be one comparable in terms of terrain, views, etc.

FIGURE 7.5: Q-15
SUBSTITUTE DESTINATIONS IN MORA FOR MOUNT FREMONT RESPONDENTS



PERCENT OF RESPONDENTS (n = 44)
Includes only the respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

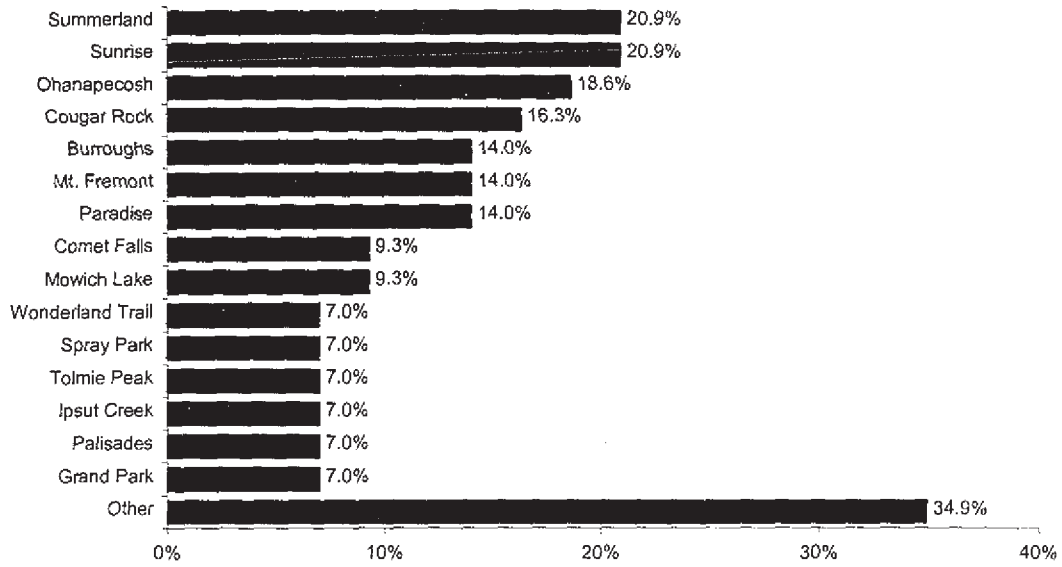
Glacier Basin Respondents' Acceptable Substitutes. As seen in Figure 7.6, the two most commonly reported acceptable substitute destinations for Glacier Basin are Summerland (20.9%) and Sunrise (20.9%). Both destinations are geographically close to Glacier Basin as are Burroughs Mountain (14.0%) and Mount Fremont (14.0%). Summerland's meadow terrain, however, differs dramatically from the more barren terrain found at Glacier Basin and on many of

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the hikes beginning at Sunrise. Almost as many respondents (18.6%) listed Ohanapecosh and Cougar Rock Campground (16.3%) as acceptable destinations. One trail starting at Ohanapecosh goes through old growth forests at a low altitude, limiting views of Mount Rainier. This hiking experience differs dramatically from the one provided at Glacier Basin. Another trail starting at Ohanapecosh goes up to the Cowlitz Divide and connects with the Wonderland Trail. This hiking experience may be more comparable to that at Glacier Basin. Similarly, hikers can take the Wonderland Trail from Cougar Rock Campground along Paradise River to Narada Falls and Reflection Lakes (a lower altitude hike) or up over Rampert Ridge. All of these trails allow for lengthy hikes which may be part of what makes them acceptable substitutes for Glacier Basin.

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FIGURE 7.6: Q-15
SUBSTITUTE DESTINATIONS IN MORA FOR GLACIER BASIN RESPONDENTS



PERCENT OF RESPONDENTS (n = 43)
Includes only the respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

Summary. Review of the acceptable destinations listed for each contact point suggest that two different factors appear to be important in selecting an acceptable substitute destination regardless of contact point: 1) geographic proximity to original destination, and 2) type of hiking experience. The importance of geographical proximity to the original destination may have emerged because respondents did not note the phrase in the question saying, "notified prior to leaving". Thus, believing that they were being told they could not hike their desired trail upon arrival, then proximity of a substitute became more important than capturing other aspects of the original hiking experience. It may be, however, that some respondents are more motivated to go to a particular part of the park rather than experience a particular type of hiking

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experience. Thus, alternative destinations are those along a predetermined trip route.

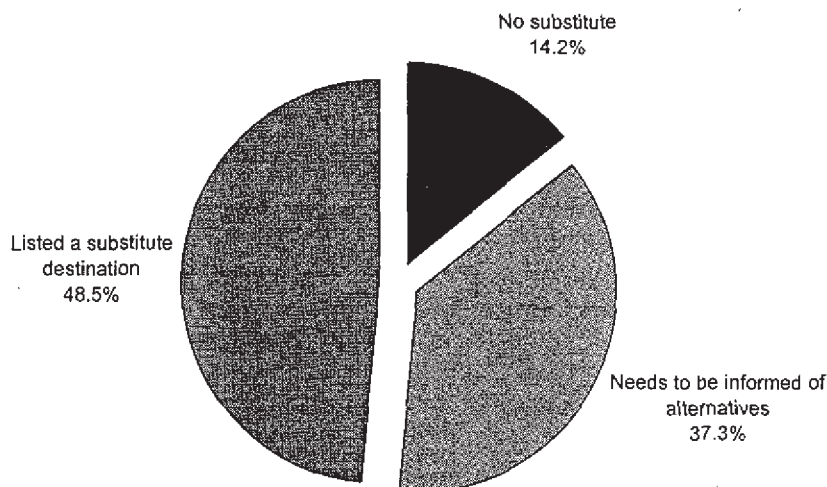
Other acceptable substitute destinations appeared to be selected because they offered comparable hiking experiences. Dimensions on which comparability appeared to be assessed included terrain, views, visitor density, and length of hike. Often these hikes were selected as substitutes even if they were relatively far from the original destination.

Availability of Substitute Destinations outside MORA

Of respondents who agreed that a substitute destination would have been acceptable, about half (48.5%) indicated an acceptable substitute destination existed outside MORA, and 37.3% would accept a substitute but would need to be informed of alternatives. A larger proportion of respondents indicated that no acceptable substitute destination was available outside MORA (14.2%) than had indicated no acceptable substitute destination was available in MORA (1.6%).

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FIGURE 7.7: Q-15
DOES AN ACCEPTABLE SUBSTITUTE DESTINATION OUTSIDE MORA EXIST?



n = 457

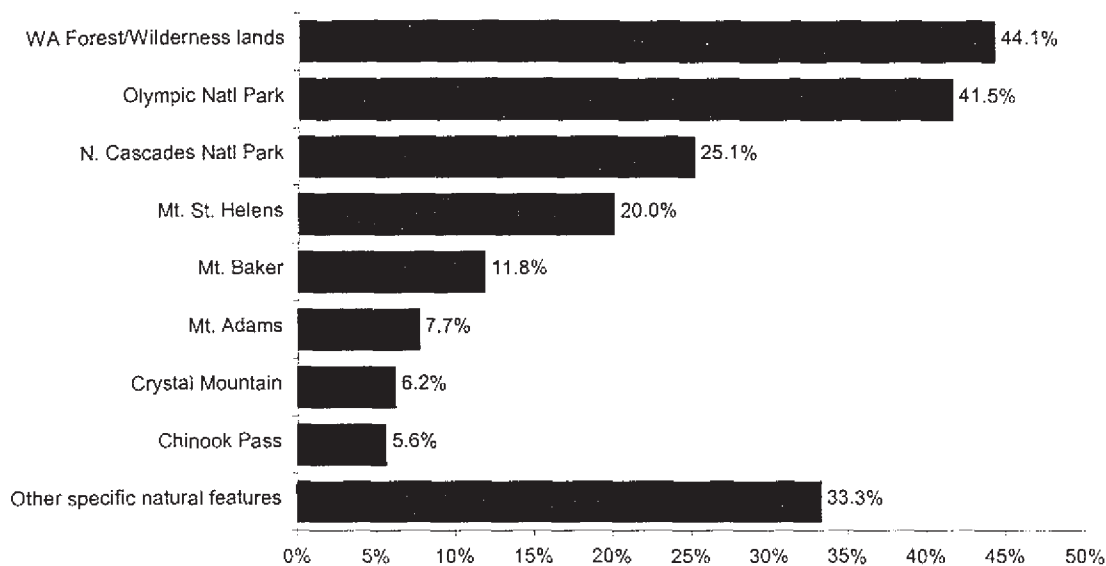
Includes only the 81.9% of respondents indicating an acceptable substitution exists.

Acceptable Substitute Destinations outside MORA

Respondents were able to list up to three acceptable substitute destinations outside MORA. Washington Forest and Wilderness lands were listed by 44.1% of respondents as an acceptable substitute destination. Olympic National Park (41.5%) and North Cascades National Park (33.3%) were the second and third most commonly listed acceptable substitute destinations outside MORA (see Figure 7.8).

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FIGURE 7.8: Q-15
SUBSTITUTE DESTINATIONS OUTSIDE OF MORA



PERCENT OF RESPONDENTS (n = 195)
Includes only the 48.5% of respondents who listed a specific destination.
Percentages sum to more than 100 because respondents could have multiple substitute destinations.

The significant number of respondents indicating other National Parks are important for at least two reasons. First, respondents indicating they would visit Olympic National Park or North Cascades National Park may be people who specifically desire a National Park visit. If so, then these respondents will not be easily displaced to a non-National Park destination. Second, should MORA decide to impose limits on the number of visitors to wilderness trails, many of these respondents (particularly those desiring a National Park experience) will visit Olympic National Park or North Cascades National Park increasing their visitation levels. This finding suggests that coordination among these three National Parks will be necessary if each park is to meet its visitation level objectives.

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Who needs information about acceptable substitutes?

A substantial number of respondents who indicated that they would accept an alternative destination either in MORA (48.5%) or outside of MORA (37.5%) would need to be informed of alternatives. For successful displacement, park management will need to be sure that these visitors obtain the necessary information to select alternatives. If park management is able to predict which visitors will need information about acceptable substitutes, it will be able to tailor the distribution of this information to most effectively reach these visitors.

Logistic regression analysis was used to select characteristics that predict whether visitors would need information. Logistic regression is a form of linear regression used when your dependent variable is dichotomous (e.g., needs information?: yes or no). In logistic regression, predictor variables may be either categorical (e.g., sex: male or female) or continuous (e.g., number of visits to

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MORA in the past 3 years: 0, 1, 2,...). Like linear regression, a stepwise procedure³¹ can be adopted to determine the best fitting model.

Respondents who need information about substitutes in MORA may be the same respondents indicating that they need information about substitutes outside MORA. If sufficient (at least 75%) overlap exists between respondents who need information for an acceptable substitute in MORA and respondents who need information for an acceptable substitute outside MORA, then groups can be defined as those needing information about substitutes and those who do not. If the overlap is insufficient, then two separate logistic regression analyses would be necessary; one for groups defined as needing information about substitutes in MORA or not and one for groups defined as needing information about substitutes outside MORA. Observed overlap was 74.2% and therefore, two separate logistic regression analyses were performed. In both analyses, the set of predictors included demographic characteristics, measures of hiking

³¹ Stepwise regression technique instructs the computer to find the "best" set of predictor variables by entering independent variables in various combinations and orders. It combines the methods of backward elimination and forward selection. The variables are in turn subject first to the inclusion criterion of forward selection and then to the exclusion procedures of backward elimination. Variables are selected and eliminated until there are none left that meet the criteria for removal. In forward selection, the computer estimates one simple regression for each independent variable and chooses the "best" variable (i.e., the one with the highest R-square [R^2] or that explains the largest percentage of the variance in the dependent variable.) Then this variable is tried in combination with each of the remaining variables to find a second that produced the largest R-square. It then continues until adding more variables no longer leads to a significant increase in the R-square. (The level of statistical significance is arbitrarily established prior to the analysis). Backward elimination begins the analysis with all the variables in the equation and removes them one at a time according to whether they meet specific criteria (levels of significance of their F-ratios). The variable with the smallest partial correlation is examined first. If it does not meet the criteria, it is eliminated; then the variable with the second smallest partial correlation is examined, and so on until no more variables are eliminated. The F ratio is the ratio of explained to unexplained variance. In these analyses, the maximum significance of F to enter was .05 and the minimum significance of F to remove was .10.

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experience at MORA, and trip characteristics (see Table 7.1 for complete list), and a stepwise procedure was used.

Logistic Regression Analysis: Needs information about substitutes in MORA

A stepwise logistic regression analysis was performed to determine which of the predictive variables listed in Table 7.1 result in the best model for predicting if a visitor needed information about acceptable substitute destinations in MORA. Of the original 437 cases, 70 were excluded due to missing data. The remaining 367 cases included 170 respondents who needed information about substitute destinations and 197 respondents who did not need information about substitute destinations. A log transformation was performed on the variables party size and trips to MORA in the past three years so they would better meet assumptions of normality.

Table 7.1. Predictive Variables Used in Logistic Regression

Age	Aware of solitude mandate	Type of trip expected
Resides in Washington	Type of group	Had destination?
Log # trips to MORA in past 3 yrs	Log party size	Sought information prior to trip
Aware of wilderness mandate	Any child < 16 in group?	Day of week contacted

The stepwise logistic regression produced a model consisting of three variables for predicting respondents who need information about acceptable substitutes in MORA, $\chi^2(4)=76.72$, $p<.001$. These three variables were a) log number of trips to MORA in past 3 years, b) type of destination, and c) children < 16 years of age in group. A total of 69.8% of cases were correctly classified (see

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Table 7.2). This model was better at predicting those respondents who need information about substitutes in MORA (75.1% correctly classified) than predicting respondents who do not need information (63.5% correctly classified; see Table 7.2).

Table 7.2 Observed and Predicted Classification: Needs Information for Acceptable Substitutes in MORA

	Predicted		% Correctly Classified
	Not Circled	Circled	
Observed:			
Not Circled	108	62	63.5%
Circled	49	148	75.1%
	Overall		69.8%

Table 7.3 summarizes the final model derived by the logistic regression. The fewer trips respondents had made to MORA in the past three years the more likely they were to need information about acceptable substitutes in MORA, $b=-1.76$, $p<.001$. Also, likelihood of needing information varied by type of destination, $p=.005$. Specifically, respondents who had no specific destination were more likely to need information than respondents who had one or multiple specific destinations, $b=.99$, $p=.013$. Last, groups that had children less than 16 years of age were more likely to need information about acceptable substitutes in MORA, $b=.73$, $p=.010$. Examination of the partial correlations between each predictor variable and the dependent variable (R) indicated that the number of trips to MORA in the past three years was the strongest predictor ($-.25$ vs. $.11$ & $.10$). Interpretation of these variables is done in conjunction with the results of

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the logistic regression to predict visitors who need information about substitute destinations outside of MORA (see p. 201).

Table 7.3. Model for Predicting Needs Information about Acceptable Substitutes in MORA

Variable	b*	S.E.	Wald	df	p-value	R
Log # of trips to MORA in past 3 years	-1.76	0.29	35.76	1	<.001	-.26
Type of destination			10.52	2	.005	.11
No Specific vs. One or Multiple destinations	0.99	0.42	5.52	1	.019	.08
Multiple vs. No specific or one destination	-0.42	0.28	2.27	1	.132	-.02
Child < 16 yrs old in group	0.73	0.28	6.65	1	.010	.10
Constant	1.12	0.22	27.13	1	<.001	

* In logistic regression the regression coefficients are interpreted as the amount of change in the log odds of the event occurring for a 1 unit change in the predictor variable. Because the dependent variable being predicted is the log odds of the event and not the probability of the event occurring, interpreting the regression coefficient as the amount of change in the likelihood that an event will happen for a 1 unit change in the predictor variable is incorrect.

When a predictive model is derived, the model can be biased to irregularities in the sample that may not be found in the population. Thus, the model may not be as effective at predicting membership for new cases as it was for predicting cases in the sample used to derive the model. One way to get a sense of the predictive validity of the model is to take random samples from the total dataset and develop a model for each sample. If these models include the same variables as the model based on the whole sample, it suggests that variations in these variables are distributed throughout the sample and not due to some small subset of cases. Thus, these variables should be effective at predicting new cases.

Five sub-samples, each consisting of approximately 50% of the total cases, were randomly generated from the total sample and a logistic regression

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was run on each. The resultant models were then compared to see the frequency with which variables were included as predictors and how effective each model was at classifying cases correctly. As shown in Table 7.4., all the models derived for the sub-samples included log number of trips to MORA in past three years. Some models also included one or both of the other variables included in the model based on the total sample, and one model included the variable for awareness of the solitude mandate. The models were fairly comparable to each other and to the model based on the total sample in their ability to correctly classify respondents (% correctly classified ranged from 66.3% to 71.4%).

Table 7.4. Summary of Models Predicting Needs Information about Substitutes in MORA

	Full Sample	Sub-Sample				
		1	2	3	4	5
Total N of sample	437	221	233	239	260	200
N after accounting for missing data	367	184	197	213	170	162
Log # of trips to MORA in past 3 years	X	X	X	X	X	X
Type of destination	X	X		X		
Child < 16 yrs old in group	X			X	X	X
Aware of Solitude Mandate				X		
Percent of cases classified correctly	68.8%	70.7%	70.6%	71.4%	66.3%	68.5%

Logistic Regression Analysis: Needs Information about Substitutes Outside MORA

A stepwise logistic regression analysis was performed to determine which of the predictive variables listed in Table 7.1 result in the best model for predicting if a visitor needed information about acceptable substitute destinations outside MORA. Of the original 387 cases, 64 were excluded due to missing

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data. The remaining 323 cases included 135 respondents who needed information about substitute destinations and 188 respondents who did not need information about substitute destinations. A log transformation was performed on the variables party size and trips to MORA in the past three years so they would better meet assumptions of normality.

The stepwise logistic regression produced a model consisting of three variables for predicting respondents who need information about acceptable substitutes outside MORA, $\chi^2(3)=22.12$, $p<.001$. These three variables were a) log number of trips to MORA in past 3 years, b) sought information prior to trip, and c) children < 16 years of age in group. A total of 60.7% of cases were correctly classified (see Table 7.5). This model was better at predicting those respondents who did not need information about substitutes outside MORA (73.9% correctly classified) than predicting respondents who do need information (42.2% correctly classified).

Table 7.5 Observed and Predicted Classification: Needs Information for Acceptable Substitutes outside MORA

	Predicted		% Correctly Classified
	Not Circled	Circled	
Observed:			
Not Circled	139	49	73.9%
Circled	78	57	42.2%
	Overall		60.7%

Table 7.6 summarizes the final model derived by the logistic regression. The fewer trips respondents had made to MORA in the past three years the more likely they were to need information about acceptable substitutes in MORA,

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$b=-1.07$, $p<.001$. Also, respondents who sought information prior to their trip to MORA were more likely to need information about acceptable substitutes outside MORA, $b=.48$, $p=.049$. Last, groups that had children less than 16 years of age were more likely to need information about acceptable substitutes in MORA, $b=.62$, $p=.034$. Examination of the partial correlations between each predictor variable and the dependent variable (R) indicated that the number of trips to MORA in the past three years was the strongest predictor ($-.17$ vs. $.07$ & $.08$).

Table 7.6. Model for Predicting Needs Information about Acceptable Substitutes outside MORA

Variable	b	S.E.	Wald	df	p-value	R
Log # of trips to MORA in past 3 years	-1.07	0.28	14.71	1	<.001	-.17
Sought information prior to trip	0.48	0.24	3.89	1	.049	.07
Child < 16 yrs old in group	0.62	0.29	4.5	1	.034	.08
Constant	0.07	0.21	.13	1	.718	

* In logistic regression the regression coefficients are interpreted as the amount of change in the log odds of the event occurring for a 1 unit change in the predictor variable. Because the dependent variable being predicted is the log odds of the event and not the probability of the event occurring, interpreting the regression coefficient as the amount of change in the likelihood that an event will happen for a 1 unit change in the predictor variable is incorrect.

When a predictive model is derived, the model can be biased to irregularities in the sample that may not be found in the population. Thus, the model may not be as effective at predicting membership for new cases as it was for predicting cases in the sample used to derive the model. One way to get a sense of the predictive validity of the model is to take random samples from the total data set and develop a model for each sample using logistic regression. If these models include the same variables as the model based on the whole sample, it suggests that variations in these variables are distributed throughout

VII. Displacement

the sample and not due to some small subset of cases. Thus, these variables should be effective at predicting new cases.

Five sub-samples, each consisting of approximately 50% of the total cases, were randomly generated from the total sample and a logistic regression was run on each. The derived models were then compared to see the frequency with which variables were included as predictors and how effective they were at classifying cases correctly. As shown in Table 7.7, four of the five models resulted in a predictive model. The first sub-sample did not result in any of the possible predictor variables being able to significantly predict respondents that needed information about substitutes outside MORA. In the four models derived from the sub-samples, each model included log number of trips to MORA in past three years. One model also included whether children less than 16 were part of the group, and one model included the variable log party size. The models were fairly comparable to each other and to the model based on the total sample in their ability to correctly classify respondents (% correctly classified ranged from 58.6% to 63.7%). These findings suggested that log number of times visited MORA in the past three years would be the most reliable predictor of who needs information about acceptable substitutes outside MORA. These random sample analyses suggested that the model derived using the whole sample was unlikely to be biased. Additionally, these findings support the interpretation that respondents with less hiking experience were more likely to need information about acceptable substitute destinations in MORA.

VII. Displacement

Table 7.7. Summary of Models Predicting Needs Information about Substitutes in MORA

	Full Sample	Sub-Sample				
		1	2	3	4	5
Total N of sample	387	194	180	192	195	198
N after accounting for missing data	323	167	145	157	162	161
Log # of trips to MORA in past 3 years	X		X	X	X	X
Sought information	X					
Child < 16 yrs old in group	X		X			
Log party size						X
Percent of cases classified correctly	60.7%		62.1%	63.7%	58.6%	62.7%

As noted earlier the overlap in respondents who need information about acceptable substitutes in MORA and those who need information about acceptable substitutes outside MORA was 74.2%, suggesting a single interpretation for both analyses would be advantageous and not unreasonable. Thus, the single interpretation of hiking experience is proposed. Individuals who have less hiking experience would have hiked at MORA less frequently as MORA is one of the most common places to hike in Washington, they would be less likely to have a specific destination(s) in mind, and they would be more likely to have sought information prior to the trip. Additionally, less experienced hikers would be less likely to hike with young children given the additional difficulty.

VIII. CONTACT POINT EFFECTS

Respondents for the WTVS were contacted at six different trails in MORA, although sufficient data to analyze were collected at only four trails. As noted in the Introduction, effects of contact point and day of week contacted were examined for each variable. It was found that a greater proportion of respondents contacted on weekdays were not local and a greater proportion of respondents contacted on weekend days lived locally. Thus, for every observed effect of day of week contacted, additional analyses were done to determine if the effect was due to respondents' residence (local vs. nonlocal), day of week contacted, or some combination. The following table indicates for each variable if there was an effect for 1) day of week contacted, 2) respondents' residence, 3) contact point, and 4) whether there was an interaction between day of week contacted and contact point. If a significant effect was observed, there is a 'Yes' in the table (blank cells indicate no effect). The table also provides a cross-reference to the section of the report that discusses the effect in detail.

VIII. Contact Point Effects

Question Number	Description	Significant Effects?					Cross-reference (page #)
		Day of Week Contacted	Residence	Contact Point	Day of Week by Contact Point	Residence by Contact Point	
III. Visitor Profile							
Q3-C	Age						
Q3-C	Gender						
Q22a	Race						
Q22b	Hispanic						
Q20	Education			Yes			34
Q21	Employment	Yes					35
Q3-C	Residence	Yes		Yes	Yes		36
Q1-C	Party size	Yes					41
Q2-C	Children < 16						
Q2-C	# of children <16						
Q27	Group Types	Yes			Yes		42
Q23	# trips to MORA in last 3 years						
Q24	# trips in last 3 yrs with hikes > 1 mile						
Q25	Aware of wilderness designation						
Q26	Aware of solitude mandate			Yes			48
IV. Trip Characteristics							
Q1	When decided to visit MORA		Yes				55
Q2	Sought info		Yes			Yes	56
Q2b	Sources where info was sought	Yes	Yes		Yes		58
Q3a	# of planned destinations		Yes	Yes			60
Q3b	Front country destinations						
Q3b	Back country destinations						
Q4	Time spent in MORA		Yes				70
Q5a	Ways of moving through MORA						
	Drive viewing scenery	Yes	Yes	Yes	Yes		74
	Taking walks/hikes						
	Camping while backpacking						
	Mountain climbing						
	Other activities			Yes	Yes		77

VIII. Contact Point Effects

Question Number	Description	Significant Effects?					Cross-reference (page #)
		Day of Week Contacted	Residence	Contact Point	Day of Week by Contact Point	Residence by Contact Point	
Q5a	Most important way of moving						
Q5a	2 nd most important way of moving			Yes			77
Q5b	Outdoor Activities			Yes	Yes		
	Picnicking	Yes		Yes	Yes		81
	Viewing wildflowers						
	Viewing wildlife			Yes			81
	Taking photos						
	Snow play	Yes		Yes	Yes		83
	Other activities				Yes		80
Q5b	Most important outdoor activity						
Q5b	2 nd most important outdoor activity						
Q5c	Facility activities						
Q5c	Most important facility activity			Yes			96
	Nature Program		Yes			Yes	88
	Shop for souvenirs		Yes	Yes	Yes		89
	Camp in campground	Yes		Yes	Yes		90
	Stay overnight in park (Inn or Lodge)	Yes		Yes	Yes		88
	Jackson Visitor Center	Yes	Yes	Yes	Yes		91
	Ohanapecosh visitor center						
	Longmire museum	Yes	Yes	Yes	Yes		93
	Eat lunch/snack at Jackson Visitor Center			Yes	Yes		88
	Eat Sun. brunch at Paradise Lodge						
	Eat a sit-down meal (ex. Brunch) at Paradise Lodge	Yes		Yes			88
	Eat a sit down meal at Longmire Inn			Yes			88

VIII. Contact Point Effects

Question Number	Description	Significant Effects?					Cross-reference (page #)
		Day of Week Contacted	Residence	Contact Point	Day of Week by Contact Point	Residence by Contact Point	
Q5c	Most important facility activity			Yes			96
Q5c	2 nd most important facility activity						
Q5d	Overall most important activity						
Q5d	Overall 2 nd most important activity						
Q5d	Overall 3 rd most important activity						
Q6	# of walks/hikes	Yes	Yes		Yes		103
Q7	Point began hike						
Q7	# of miles hiked			Yes			111
Q7	Time spent hiking			Yes			113
Q8	Left trail	Yes			Yes		116
	Went to bathroom			Yes	Yes		118
	Get away from people						
	To be alone						
	Visit ponds/tairns			Yes			119
	View wildflowers/wildlife						
	Better view						
	To explore						
	Snow play						
	Don't know						
	Other reasons						
V. Trip Experiences and Evaluation							
Q11	Actual # of visitors v. expected			Yes			123
Q12	Actual # of visitors v. preferred	Yes			Yes		126
Q13a	Incident detracted from experience			Yes	Yes		128
Q13c	Degree detracted						
Q13b	How others detracted						
Q14	Degree of crowding	Yes		Yes			135
Q9	Effects on future decisions				Yes		141

VIII. Contact Point Effects

Question Number	Description	Significant Effects?					Cross-reference (page #)
		Day of Week Contacted	Residence	Contact Point	Day of Week by Contact Point	Residence by Contact Point	
Q9	More likely to return to MORA						
	Come at different time of day						
	Come on different day of week						
	Come at different time of year						
	Plan to do different activities						
	Visit different area of MORA						
	Not return to MORA						
	Other effects						
Q10	Visitor damage			Yes			143
Q10	Type of damage						
Q10	Degree damage detracted						
Q3-C	Type of trip expected						
Q16	Actual type of trip				Yes		147
	Actual v. Expected type of trip						
Q17	Overall trip satisfaction						
VI. Displacement							
Q15	Availability of acceptable substitute						
Q15	Acceptable destinations in MORA						
Q15	Acceptable destinations outside MORA						

APPENDIX A

**1995 Mount Rainier National Park
Trail Use Visitor Survey**

Cooperative Park Studies Unit
College of Forest Resources
University of Washington, Box 352100
Seattle, Washington 98195-2100

"Public reporting burden for this collection of information is estimated to average 18 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Cooperative Park Studies Unit, University of Washington, College of Forest Resources, 15 Anderson Hall, Box 352100, Seattle, Washington, 98195-2100, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503."

On a recent trip to Mount Rainier National Park you agreed to complete this mail questionnaire concerning your trip and your perceptions of the park. Thank you for your cooperation.

While filling out this questionnaire please remember that **all questions ask about the trip to Mt. Rainier during which you were contacted for this survey.** Also, please be sure to read each question carefully before answering it.

First, we would like to ask you some questions about what you did on your trip and how you decided where to go.

1. How long before the visit to Mt. Rainier National Park during which you were contacted did you make the decision to visit the park? *(Circle one number.)*

- 1 THAT DAY
- 2 THE DAY BEFORE
- 3 TWO OR THREE DAYS BEFORE
- 4 FOUR TO SEVEN DAYS BEFORE
- 5 EIGHT TO 14 DAYS BEFORE
- 6 MORE THAN TWO WEEKS BUT LESS THAN A MONTH BEFORE
- 7 A MONTH OR MORE BEFORE THE VISIT

2. **PRIOR TO THE VISIT DURING WHICH YOU WERE CONTACTED,** did you and your group seek information about Mt. Rainier National Park and/or the attractions that are found within its boundaries? *(Circle one number.)*

- 1 NO -> **GO TO QUESTION 3a**
- 2 YES - From which sources did you and your group seek to obtain information?
(Circle as many numbers as apply.)

- 1 FRIENDS OR RELATIVES
- 2 TRAVEL GUIDE/TOUR BOOK
- 3 NEWSPAPER/MAGAZINE
- 4 MAPS/BROCHURES
- 5 RADIO/TELEVISION
- 6 HOTEL/MOTEL
- 7 CONVENTION/VISITOR BUREAU
- 8 OTHER *(Please specify: _____)*

3a. In terms of destinations within Mt. Rainier National Park, which of the descriptions below best fits your party during the trip when you were contacted for this survey? (Circle one number)

- 1 We had not determined any specific destinations before entering Mt. Rainier National Park → **GO TO QUESTION 4**
- 2 Before entering the park we had decided on multiple destinations, all of which were important to our satisfaction.
- 3 Before entering the park we had decided on one destination that was the focus of our visit to Mt. Rainier.

3b. Destinations in Mt. Rainier can be roughly grouped into "frontcountry" and "backcountry" classifications. For our purposes, frontcountry destinations are defined as man-made facilities and roads, and the natural areas that are in the immediate vicinity of such facilities; backcountry destinations are hiking trails or natural features of the park that extend more than a half-mile from man-made facilities or roads. Based on your answer to question 3a, specify the destination(s) of your trip. If you answered "3" to question 3a, specify only ONE destination.

If you had one or more FRONTCOUNTRY destinations, please specify them below

If you had one or more BACKCOUNTRY destinations, please specify them below

4. On the trip during which you were contacted, how long were you inside Mt. Rainier National Park?

(Please specify the number of days and/or hours. If you did not stay overnight in the area write "0" for the number of "DAYS".)

_____ DAYS _____ HOURS

5a. On the trip to Mt. Rainier National Park during which you were contacted for this survey how did you move through and experience the park environment? (Circle as many numbers as apply.)

- 1 Driving around viewing scenery from road and turnouts
- 2 Taking walks or hikes
- 3 Camping overnight while backpacking
- 4 Mountain climbing using specialized equipment
- 5 Other (e.g., skiing, bicycling, etc.; Please specify: _____)

Which of these five ways of experiencing the park was most important to your enjoyment of the park environment? (Enter the appropriate number in each of the blanks.)

_____ MOST IMPORTANT way of experiencing the park

_____ SECOND MOST IMPORTANT way of experiencing the park

5b. During the same trip, in which of the following outdoor activities did you and your party participate? (Circle as many numbers as apply.)

- 6 Picnicking
- 7 Viewing wildflowers
- 8 Viewing wildlife
- 9 Taking photographs
- 10 Snow play
- 11 Other activities not described by items 1 to 10 in question 5a or 5b above

(Please specify: _____)

If you circled 2 or more of the outdoor activities numbered 6 through 11 above, which was most important to your enjoyment of the park? (Enter the appropriate number in each of the blanks.)

_____ MOST IMPORTANT activity

_____ SECOND MOST IMPORTANT activity

5c. On the trip to Mt. Rainier National Park during which you were contacted for this survey, in which of the following park activities did you and your party participate?
(Circle as many numbers as apply.)

- 12 Attending a park service naturalist program or activity
(Circle the site(s) of the program: Longmire / Paradise / Ohanapecosh)
- 13 Shopping for curios or souvenirs
(Circle the shop(s): Longmire / Paradise / Ohanapecosh)
- 14 Camping overnight in a campground
(Circle your campground(s): Sunshine Pt. / Cougar Rock /
Ohanapecosh / White River)
- 15 Staying overnight within the park
(Circle your lodging(s): Longmire Inn / Paradise Lodge)
- 16 Going to Paradise Visitor Center
- 17 Going to Ohanapecosh Visitor Center
- 18 Going to Longmire Museum
- 19 Eating lunch or snack at Paradise Visitor Center (fast food)
- 20 Eating Sunday brunch at Paradise Lodge
- 21 Eating a sit-down meal at Paradise Lodge other than Sunday brunch
- 22 Eating a sit-down meal at Longmire Inn

If you circled 2 or more of the activities numbered 12 through 22 above, which was most important to your enjoyment of the park? (Enter the appropriate number in each of the blanks.)

_____ MOST IMPORTANT activity

_____ SECOND MOST IMPORTANT activity

5d. Considering ALL of the 22 activities and ways of experiencing the park listed in 5a, 5b and 5c, which would you say were most important to your enjoyment of Mt. Rainier National Park? (Enter the appropriate number in each of the blanks.)

_____ MOST IMPORTANT activity or way of experiencing the park

_____ 2nd MOST IMPORTANT activity or way of experiencing the park

_____ 3rd MOST IMPORTANT activity or way of experiencing the park

6. On the trip to Mt. Rainier during which you were contacted for this survey, how many walks or hikes did you take?

_____ WALKS OR HIKES

7. On the walk or hike during which you were contacted for this survey:

where did you begin your walk or hike? _____
(Please be as specific as possible.)

about how many miles did you walk? _____ Miles
(Round trip. Use fractions for distances under 1 mile)

about how long did the walk take? _____ Hrs _____ Min
(Round trip.)

8. At any time while you were in the area where you were contacted at Mt. Rainier National Park did you leave the main trail for more than a few feet? (Circle one number)

1 NO -> **GO TO QUESTION 9**

2 YES -> Listed below are some possible reasons for leaving the trail. Please indicate for which of these reasons you left the trail. (Circle as many numbers as apply)

- 1 WENT TO THE BATHROOM
- 2 TO GET AWAY FROM PEOPLE
- 3 TO BE ALONE
- 4 TO VISIT PONDS OR TARNs
- 5 TO VIEW WILDFLOWERS/WILDLIFE
- 6 TO GET A BETTER VIEW OF MT. RAINIER
- 7 TO EXPLORE
- 8 TO TOUCH/PLAY IN SNOW
- 9 DON'T KNOW WHY
- 10 OTHER (please specify) _____

Next, we would like to ask you questions about how conditions in the area where you were contacted for this survey affected your experience. Please answer each question by thinking of your experiences in the immediate vicinity of the area where you were contacted for this survey.

9. Please recall your experience on the hike during which you were contacted. Will the number of other visitors that you encountered on this trip affect your future decisions concerning visits to Mt. Rainier National Park? *(Circle one number.)*

1 NO -> **GO TO QUESTION 10**

2 YES -> Which of the following describe ways in which other visitors might affect your decision? *(Circle as many numbers as apply.)*

- 1 Will be more likely to return to Mt. Rainier
 - 2 Will come at a different time of day
 - 3 Will come on a different day of the week
 - 4 Will come at a different time of year
 - 5 Will plan to do different activities
 - 6 Will visit a different area of the park
 - 7 Will not return to Mt. Rainier
 - 8 Other effects not described *(Please specify below.)*
-

10. Did you see any evidence that other visitors had unacceptably damaged park resources in the place where you were contacted at Mt. Rainier National Park? *(Circle one number.)*

1 NO -> **GO TO QUESTION 11**

2 YES -> What was the damage?

Where did you see it?

Did the damage you saw detract from your enjoyment of the park?
(Circle one number.)

- 1 NO, DID NOT DETRACT FROM EXPERIENCE
- 2 YES, DETRACTED SOMEWHAT
- 3 YES, DETRACTED MODERATELY
- 4 YES, DETRACTED GREATLY

11. Before you visited the area in which you hiked you might have had expectations about the number of visitors you would see. Were there more visitors than you expected, fewer than you expected, or about the same number as you expected? *(Circle one number.)*

- 1 A LOT LESS THAN EXPECTED
- 2 LESS THAN EXPECTED
- 3 AS EXPECTED
- 4 MORE THAN EXPECTED
- 5 A LOT MORE THAN EXPECTED

- 6 NO EXPECTATIONS

12. Besides expectations, you might also have preferences about the number of visitors you would like to see while you were hiking. Were there more visitors than you preferred, fewer than you preferred, or about the same number as you preferred? *(Circle one number.)*

- 1 A LOT LESS THAN PREFERRED
- 2 LESS THAN PREFERRED
- 3 AS PREFERRED
- 4 MORE THAN PREFERRED
- 5 A LOT MORE THAN PREFERRED

- 6 NO PREFERENCE

13. At any time during your visit to the area where you were contacted for this survey were there one or more incidents when a person's or party's behavior detracted from your experience? (Circle one number)

1 NO -> GO TO QUESTION 14

2 YES -> Please describe the behavior that had the largest impact in detracting from your experience.

To what degree did the person's or party's behavior detract from your experience. (Circle one number)

- 1 DETRACTED SOMEWHAT
- 2 DETRACTED MODERATELY
- 3 DETRACTED GREATLY

If more than one incident occurred, please describe the behavior that had the second largest impact in detracting from your experience.

To what degree did the person's or party's behavior detract from your experience. (Circle one number)

- 1 DETRACTED SOMEWHAT
- 2 DETRACTED MODERATELY
- 3 DETRACTED GREATLY

14. To what degree did the number of people that you encountered in the area where you were contacted for this survey make you feel "crowded"? (Circle one number)

Not at all Crowded		Slightly Crowded		Moderately Crowded			Extremely Crowded	
1	2	3	4	5	6	7	8	9

15. If, prior to your trip, you had been notified that the trail(s) at the site where you were contacted for this survey were filled to capacity and you were not able to go there, would there have been an acceptable substitute destination for you to visit instead? (*Circle one number*)

1 NO, THERE WOULD NOT HAVE BEEN AN ACCEPTABLE SUBSTITUTE DESTINATION -> **GO TO QUESTION 16**

2 YES, A SUBSTITUTE DESTINATION WOULD HAVE BEEN ACCEPTABLE

List acceptable substitute destinations **INSIDE** Mt. Rainier National Park (list in order of preference, or circle #1 or #5).

1 None of the acceptable substitutes are in Mt. Rainier National Park

2 _____

3 _____

4 _____

5 Would accept a substitute but would need to be informed of alternatives.

Please list acceptable substitute destinations **OUTSIDE** Mt. Rainier National Park but in the Northwestern US (list in order of preference, or circle #1 or #5).

1 None of the acceptable substitutes are outside Mt. Rainier National Park

2 _____

3 _____

4 _____

5 Would accept a substitute but would need to be informed of alternatives.

16. Which of the following three descriptions best fits the kind of experience you had during this hiking trip to backcountry areas in Mt. Rainier National Park? *(Circle one number.)*

1. **Wilderness hiking trip** - a trip through a scenic area with little evidence of man, many opportunities for solitude, and a chance for challenge in navigating and hiking over difficult terrain.
2. **Scenic hiking trip** - a trip through a scenic area with some evidence of man, fewer opportunities for solitude, and trails that show good routes through difficult terrain.
3. **Social recreation trip** - a trip in a scenic area with much evidence of man, beautiful views of rugged terrain, and seeing other people on the trails makes the trip more fun.

17. Overall, how would you rate your experience on this trip to Mt. Rainier National Park? *(Circle one number.)*

- 1 POOR
- 2 FAIR
- 3 GOOD
- 4 VERY GOOD
- 5 EXCELLENT
- 6 PERFECT

Finally, we would like to ask a few background questions. The information provided will be used for statistical purposes only.

18. Are you: *(Circle one number.)*

- 1 FEMALE
- 2 MALE

19. What year were you born?

19 _____

20. What is the highest level of formal schooling you have completed? *(Circle the appropriate number.)*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24+
(Elementary thru High School) (College/Vocational) (Graduate/Professional)

21. Which of the following best describes your current employment status? *(Circle the appropriate number.)*

- 1 STUDENT
 - 2 HOMEMAKER
 - 3 RETIRED
 - 4 MILITARY
 - 5 EMPLOYED
 - 6 UNEMPLOYED
- | What is your occupation?
|
| _____

22. Are you: (Circle one number)

- 1 AMERICAN INDIAN/ALASKA NATIVE
- 2 ASIAN
- 3 BLACK
- 4 WHITE
- 5 OTHER (Specify): _____

Are you: (Circle one number)

- 1 HISPANIC
- 2 NON-HISPANIC

23. **INCLUDING THE TRIP DURING WHICH YOU WERE CONTACTED**, how many trips have you made to Mt. Rainier National Park in the last three years?

NUMBER OF TRIPS _____

24. On how many of the trips in Question 23 (trips to Mt. Rainier in the last 3 years) did you walk or hike more than a mile from a visitor center or road? **(Please do NOT include hikes in Paradise Meadows, Sunrise/First Burroughs, and Grove of the Patriarchs when answering this question.)**

NUMBER OF TRIPS _____

25. Are you aware that about 97% of Mt. Rainier National Park is officially designated by Congress as Wilderness? *(Circle one number.)*

1 YES
2 NO

26. Did you know that natural areas officially designated as Wilderness are required by law to provide "opportunities for solitude" and to be managed "so that the imprint of man is substantially unnoticeable"? *(Circle one number.)*

1 YES
2 NO

27. What was the makeup of your group on the trip during which you were contacted? *(Circle one number.)*

1 INDIVIDUAL
2 FAMILY
3 FRIENDS
4 FAMILY & FRIENDS
5 ORGANIZED TOUR GROUP
6 OTHER *(Please specify: _____)*

28. Is there anything else you would like to tell us about your visit to Mt. Rainier National Park? Please use this space for any comments you would like to make.

APPENDIX B

Date:
Time:
Contact point:
Survey worker:

**1995 Mount Rainier National Park
Backcountry Survey Contact Sheet**

The National Park Service would like to send you a brief questionnaire regarding your current visit to Mt. Rainier National Park. Your participation in this survey will help us to better meet the needs of visitors to the reserve. Thank you for your time.

1. How many people are in your group today?

_____ PEOPLE

2. Are there any children under age 16 in your group today? *(Circle one number.)*

1 NO

2 YES - What are the ages of the children under age 16 in your group:

3. Please have each person in your party who is age 16 or older provide the following information. Only a sample of the persons in your party will be sent questionnaires.

1) Name _____ Age _____

Mailing Address _____ Sex: F M

(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

2) Name _____ Age _____

Mailing Address _____ Sex: F M

(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

TURN PAGE OVER TO WRITE INFORMATION FOR OTHER PARTY MEMBERS

3) Name _____ Age _____
Mailing Address _____ Sex: F M
(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

4) Name _____ Age _____
Mailing Address _____ Sex: F M
(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

5) Name _____ Age _____
Mailing Address _____ Sex: F M
(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

6) Name _____ Age _____
Mailing Address _____ Sex: F M
(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

7) Name _____ Age _____
Mailing Address _____ Sex: F M
(Number and Street)

(City, State, Zip Code, Country)

DESCRIPTION THAT BEST FITS EXPECTATIONS _____

Which of the following three descriptions best fits the kind of experience you are expecting to have during this hiking trip to backcountry areas in Mt. Rainier National Park? (*Circle one number.*)

- A. **Wilderness hiking trip** - a trip through a scenic area with little evidence of man, many opportunities for solitude, and a chance for challenge in navigating and hiking over difficult terrain.
- B. **Scenic hiking trip** - a trip through a scenic area with some evidence of man, fewer opportunities for solitude, and trails that show good routes through difficult terrain.
- C. **Social recreation trip** - a trip in a scenic area with much evidence of man, beautiful views of rugged terrain, and seeing other people on the trails makes the trip more fun.

APPENDIX C

HOW TO USE THIS REPORT

This section is a brief introduction to the basic statistical methods included in this report. It defines some key terms and illustrates the ways in which the statistical tables and graphs have been prepared.

The main tool used in statistics is data--those observations and measurements that are recorded in a study. As commonly used, the word "data" is plural. For example, all of the visitors' ages comprise data. A single unit of data -- for example, the age of a single visitor -- is a datum.

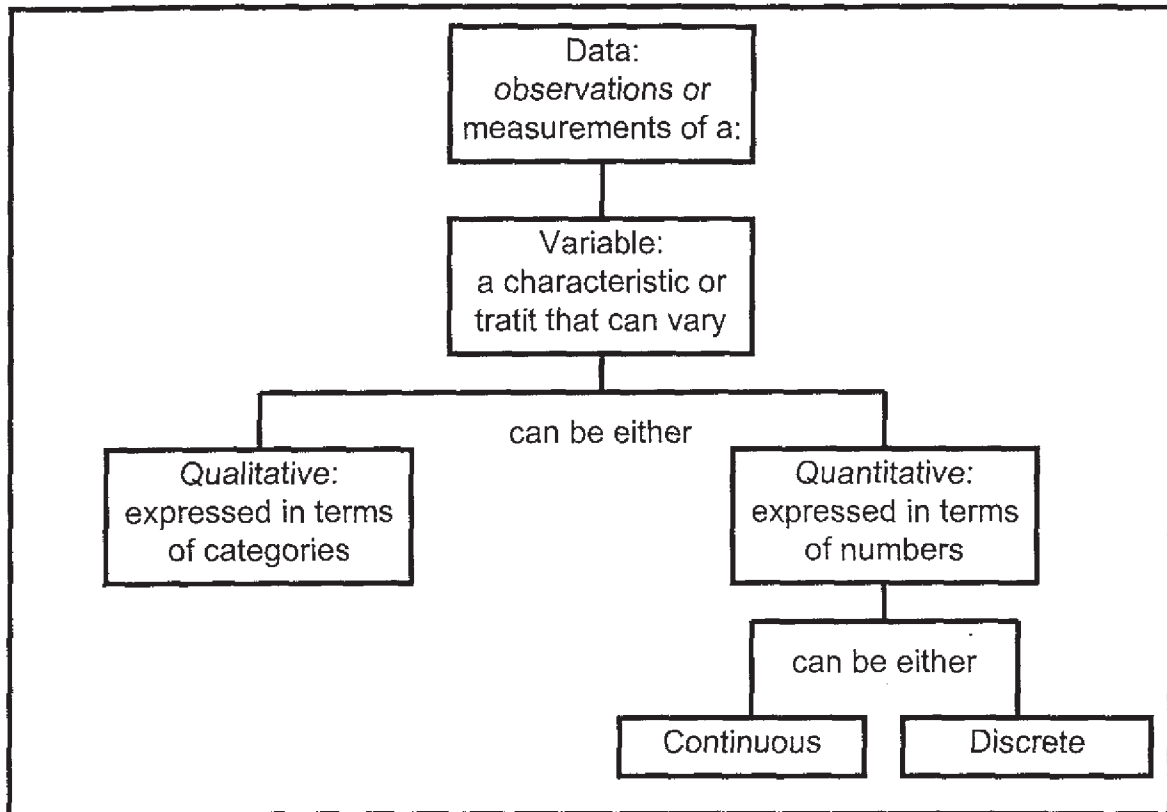
Data are collected about relevant variables. A variable is simply a characteristic or trait of interest that can vary. For example, the ages of visitors, their party characteristics, or their satisfaction with wildlife sightings at MORA can all be considered variables: Each of these traits or characteristics varies from person to person in the study sample.

Variables can be of two types: Qualitative variables are expressed in terms of categories, such as whether or not a visitor has been to the Visitor Center. Quantitative variables are expressed in terms of numbers, such as the size of a visitor party.

Discrete quantitative variables have distinct and separate units. There are no values possible between the units of a discrete variable. For example, the number of visitors in a single party consists only of whole numbers of people. One cannot talk about a party of 1 1/2 persons.

Figure D.1 illustrates these concepts.

FIGURE D.1. FLOW CHART OF STATISTICAL CONCEPTS AND TERMINOLOGY



Often data for more than one variable are collected. The data for the unit of analysis under consideration (an individual visitor, a single party, a specific park) are a case. Statistical analyses are done on groups of cases to form a data set. The number of cases in a data set is usually referred to as "n." For example, if 1000 visitors answered a question, $n = 1000$.

In many instances, respondents do not answer all of the questions in a survey. They either inadvertently skip a question or are asked to skip question because it does not apply to them. When a respondent does not answer a

question that they should have answered, he/she is a "missing case" for that question. If the number of missing cases exceeds 10 percent of those who should have answered the question, a corresponding footnote or statement in the text will indicate this fact.

Data can be collected for all of the possible cases such as on every visitor to MORA. This is a census. Alternately, data can be collected for a sample of the total population. There are many ways to choose a sample. One common approach is a random probability sample, in which each individual has an equal chance of being included in the data set. In the strictest mathematical sense, the WTVS sample is not random due to the possibility of bias through non-response. However, the authors believe that the potential bias is so minimal that, for ordinary management purposes, the sample can be considered random and therefore, representative of the population of visitors to the studied wilderness trails.

The data from this survey are reported as descriptive statistics. Descriptive statistics are used to summarize a large group of numbers and to describe general characteristics of the data set. For example, there might be a long list of each visitor's age. Descriptive statistics can be used to quickly summarize this long list. The average (mean) age would be the total of all the cases' ages divided by the number of cases. The modal age (mode) would be the most frequently reported age. The range would be the spread of ages from the youngest to the oldest.

In addition to descriptive statistics, inferential statistical procedures have been used to determine the likelihood that observed relationships among the different variables are due to chance. The smaller the likelihood that an observed effect is due to chance the more confident one can be that the effect is due to systematic variation. The p-value is the probability of obtaining the observed result due to chance alone and is directly related to the results of the statistical test. By convention, when the probability of obtaining a result due to chance is very small ($p < .05$), then it is concluded that the observed effect is due to systematic variation or a "real" effect. Results with p-values less than .05 are also referred to as significant. In this report, you will see the value of the statistic and its corresponding p-value (e.g., $\chi^2(1)=3.44, p < .01$). The important thing to remember is that effects that have p-values less than .05 are considered real effects.

The most common statistical procedure used in this report is the chi-square test for independence. This statistical test determines if the pattern of responses for one categorical variable differs across different categories of the second categorical variable. For example, suppose a chi-square test examining the relationship between sex of respondent and day of week contacted was significant. This means that the proportion of males and females among respondents contacted on weekdays (e.g., 50% males, 50% females) differed significantly from that of respondents contacted on the weekend (e.g., 60% males, 40% females).

When one of the variables are measured on a continuous (e.g., age) rather than categorical (e.g., gender) basis, the statistical procedure used to examine differences across groups is Analysis of Variance (F-test). A significant F-value indicates that there is a significant difference among the groups. If there are more than 2 groups, follow-up tests (e.g., post hoc Tukey tests) can be performed to determine which groups differ from each other. Additional statistical procedures used in this report are explained briefly either in the text or a footnote when they are first introduced.

Statistics can be presented in several formats. Tables simply organize the data into horizontal and vertical columns and sometimes include brief explanations. Graphs or figures illustrate the data through a visual presentation. All of these formats are present in this report.



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environment and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interest of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under US administration.

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