REGIONAL AND ECONOMIC SCIENCES
Applied Policy Studies for the Public and Private Sectors

REPORT ON THE MAIL-IN SURVEY OF USERS OF LAKE ALOHA IN THE DESOLATION WILDERNESS AREA OF EL DORADO NATIONAL FOREST

Prepared for the El Dorado Irrigation District

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SECTION 1 ❖ INTRODUCTION

Focus of the Study

This is a study using mail-in surveys collected in the summer and fall of 1999 from participants at the Lake Aloha site. The purpose of the survey is to examine characteristics of the users of the lake, their preferences for activities around the lake and its surroundings, their recent experiences around the lake and other behavioral characteristics of the users.

The summary data will be presented as text in the body of the report, tables to illustrate the patterns of responses, summary statistics to illustrate the findings in the database, and analytical statistical methods to describe the sample respondents. Appendix A contains the full questionnaire used in the data collection activities in 1999. There are 109 questions in the questionnaire including those requiring multiple responses. Multiple responses are those that allow the respondent to reply more than once to a question. These will be summarized in tabular form and further analyses will be conducted as feasible. There are 263 completed questionnaires in this data set, and in some instances, the tables will show less than the set of completed interviews. This result may be due to incomplete responses or to questions that have skip patterns in them resulting in fewer questions for the respondent to answer. In general, however, the sample size is 263 completed questionnaires.

The Sample

For the Aloha Survey, 563 letters and questionnaires were mailed to persons who had been issued U.S. Forest Service use permits during the 1999 recreation season. Of these, 35 were returned undeliverable as addressed. Thus, 527 were delivered to potential respondents. Of these 527, 263 completed surveys were returned. This yields a response rate of 50.4% after two (2) follow-up mailings.

Data Collection

The data was collected by the Survey Research Center at California State University, Chico, starting June 20, 1999 and ending October 30, 1999.

SECTION 2 ❖ CHARACTERISTICS OF THE RESPONDENTS

This section of the report describes the background characteristics of this sample of respondents. In general, they are somewhat different from others in California. They tend to have higher incomes, more education, and they are not representative of the racial and ethnic composition of the state. They are similar in family size and age of Californians, and they have a lower rate of disabilities.

The first question, near the end of the questionnaire in Appendix A, asked about the characteristics of the respondents' households:

Q26. How many people are in your household? _____Persons

Table 2.1 indicates there are approximately 2.7 persons per household, and most of the respondents have no one under the age of 18 in their household. Table 2.2 shows that distribution.

Table 2.1. Persons in the respondent's household.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q26	260	2.692308	1.445783	1	10

Table 2.2. Frequencies of persons in respondents' households under 18.

Number of persons under 18	Frequency	Percent	Cumulative
0	153	61.45	61.45
1	41	16.47	77.91
2	45	18.07	95.98
3	8	3.21	99.20
4	1	0.40	99.60
8	1	0.40	100.00
Total	**249**	**100.00**	

When asked in Question 27 about whether the respondent had a disability the predominant answer is “no”: almost 97% of the 260 persons who responded indicated they did not have a disability.

Q27. Do you have a disability?

Yes
No

The ages of the respondents range from 12 to 74. It is not clear why 2 respondents age 12 and 16 were included in this sample since it is designed to include only those 18 and over.

Table 2.3 illustrates the age distribution. The sample appears to be older than one might normally assume for entry into such a wilderness.

Q28. In what year were you born? _____

Table 2.3. Age distribution of the respondents.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
age	260	39.82692	11.45399	12	74

Figure 2.1 shows that the age distribution is a normal (bell-shaped curve), and it is centered around 40 years of age.

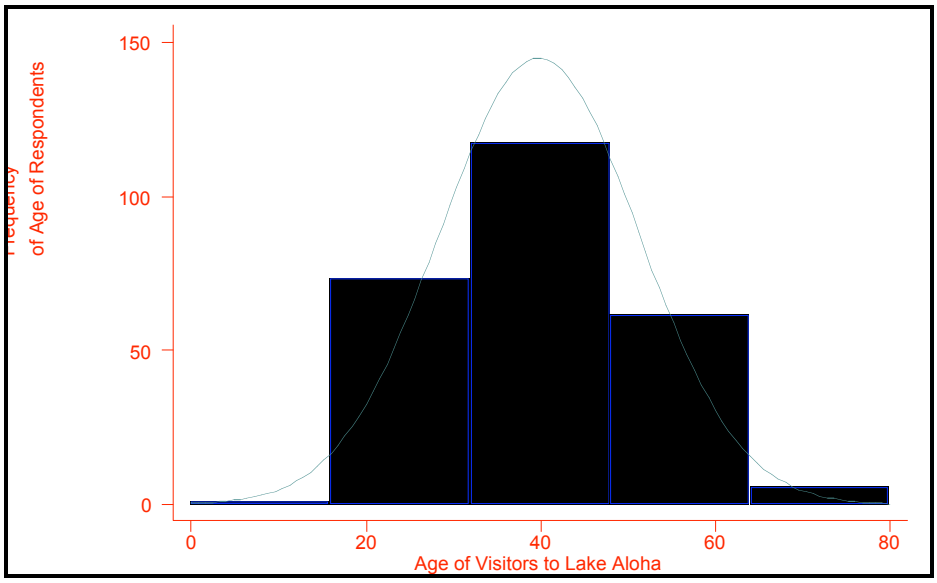

FIGURE 2.1

The race or ethnic characteristics of the respondents in this survey are predominantly white. Table 2.4 illustrates the distribution. Very low frequencies of other race or ethnic groups appear in this table.

Q29. Which cultural or ethnic group do you most closely identify with?

Native American or Alaskan Native
Asian or Pacific Islander
Black or African American, not of Hispanic origin
Hispanic
White, not of Hispanic origin
Other _____

Table 2.4. Ethnic composition of visitors at Lake Aloha.

Cultural/ethnic group	Frequency	Percent	Cumulative
Native American or Alaskan native	3	1.17	1.17
Asian or Pacific Islander	9	3.52	4.69
Black or African American	1	0.39	5.08
Hispanic	3	1.17	6.25
White	235	91.80	98.05
Other	5	1.95	100.00
Total	**256**	**100.00**	

The “other” category engendered the following set of responses that are not part of Table 2.4. One might consider recoding these into the categories in Table 2.4, but Regional & Economic Sciences (RES) is hesitant to do so since it is best to let the respondents decide on their ethnic or racial origins. Thus Table 2.5 will remain as it is.

Table 2.5. Other categories of race and ethnic origin.

Other ethnic groups	Frequency	Percent	Cumulative
Asian/Pacific Islander & White	1	20.00	20.00
Turkish	1	20.00	40.00
Spanish (Spain/Italy)	1	20.00	60.00
Norwegian	1	20.00	80.00
Jewish	1	20.00	100.00
Total	**5**	**100.00**	

The respondents in this sample are quite highly educated. Almost 77% of the respondents indicated they had a college degree or more of formal education. Table 2.6 shows that pattern in the data. Question 30 indicates the text of the question.

Q30. Which category best describes the highest education level that you have completed?

Table 2.6. Formal education respondents at Lake Aloha.

Highest education level	Frequency	Percent	Cumulative
High School not completed	3	1.16	1.16
High School graduate	4	1.54	2.70
Some college	53	20.46	23.17
College graduate	83	32.05	55.21
Graduate school or professional degree	116	44.79	100.00
Total	**259**	**100.00**	

The annual income of the respondents was obtained by this question which question asks:

Q31. Which category best describes your annual household income?

Under $10,000
$10,000 - $19,999
$ 20,000 - $ 29,999
$ 30,000 - $ 39,999
$ 40,000 - $49,999
$ 50,000 - $59,999
$ 60,000 - $79,999
$ 80,000 - $99,999
$100,000 - $200,000
More than $200,000

Table 2.7 shows the income distribution of the respondents. The median annual household income of this group is in the bracket $60,000 to $80,000. This compares to about $40,000 per household for the typical Californians.

Table 2.7. Income distribution of those who visited Lake Aloha.

Annual household income	Frequency	Percent	Cumulative
Under $10,000	7	2.82	2.82
$10,000-$19,999	13	5.24	8.06
$20,000-$29,999	13	5.24	13.31
$30,000-$39,999	24	9.68	22.98
$40,000-$49,999	20	8.06	31.05
$50,000-$59,999	23	9.27	40.32
$60,000-$79,999	38	15.32	55.65
$80,000-$99,999	34	13.71	69.35
$100,000-$200,000	63	25.40	94.76
More than $200,000	13	5.24	100.00
Total	**248**	**100.00**	

SECTION 3 ❖ SITE USE CHARACTERISTICS

Table 3.1 indicates the monthly entry rates to the Lake, and Figure 3.1 portrays it graphically. August is clearly the most frequently used month for travel to the area. The first question in the survey asked:

Q1. What month and day did you <u>enter</u> Desolation Wilderness on your most recent visit?

Month _____
Day _____

Table 3.1. Desolation Wilderness entrances by month.

Month Entered Desolation Wilderness Recently	Frequency	Percent	Cumulative
June	10	3.86	3.86
July	67	25.87	29.73
August	105	40.54	70.27
September	56	21.62	91.89
October	21	8.11	100.00
Total	**259**	**100.00**	

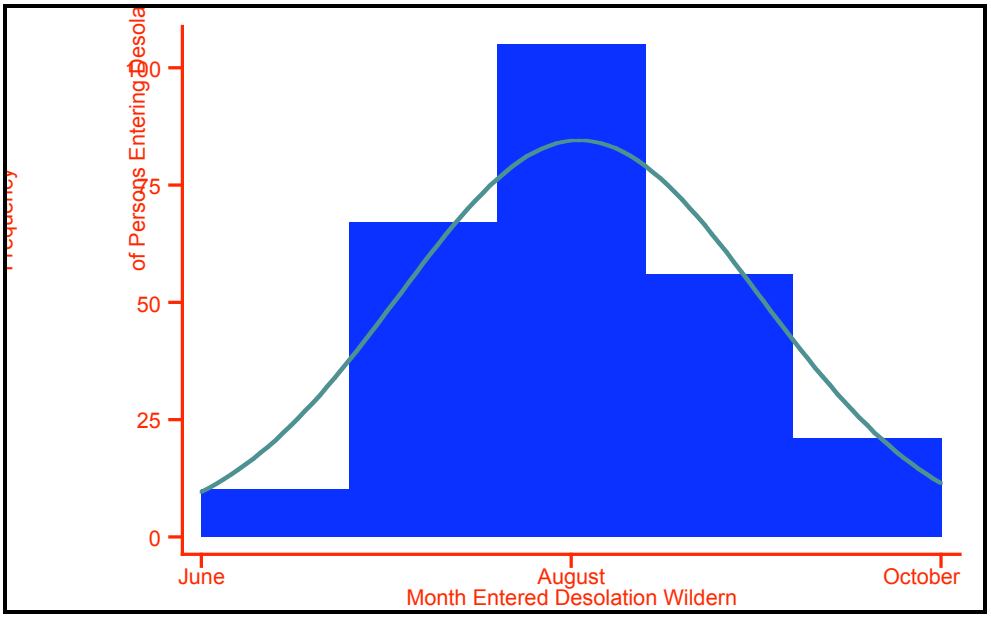

Figure 3.1

In August almost 41% of the respondents indicated they entered the area. Desolation Wilderness use increases up to August, then decreases afterwards to a low in October.

Since August is the most frequently used month of entry, August is also the most frequent month for exiting the area. Table 3.2 shows that distribution. Figure 3.2 indicates that pattern graphically. Question 2 asked:

Q2. What month and day did you <u>leave</u> Desolation Wilderness on your most recent visit?

Month _____
Day _____

Table 3.2. Month exited during most recent visit.

Month left Desolation Wilderness	Frequency	Percent	Cumulative
June	9	3.54	3.54
July	64	25.2	28.74
August	101	39.76	68.5
September	59	23.23	91.73
October	21	8.27	100.00
Total	**254**	**100.00**	

Respondents indicated that almost 41% entered the Wilderness and almost 40% exited the area in August. August is the month they entered and exited the area at the highest frequencies of the five months in which measurement was conducted.

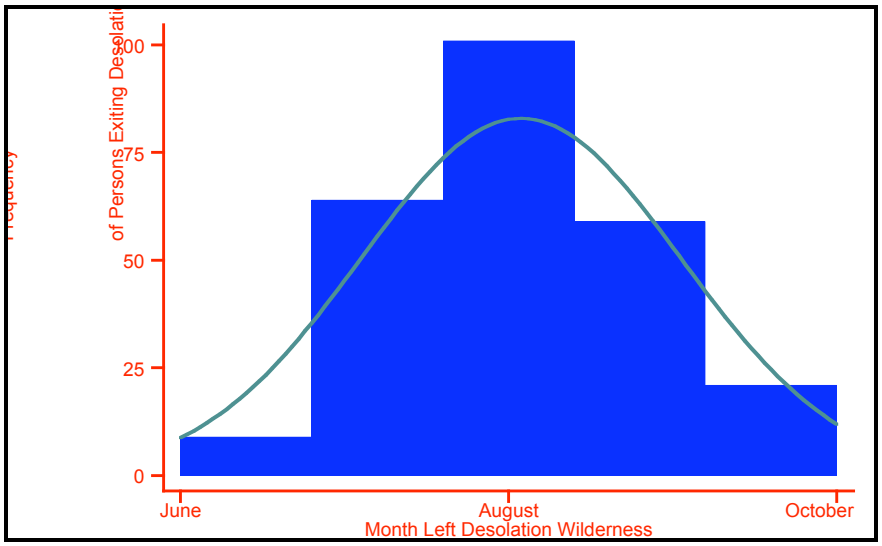

Figure 3.2

Table 3.3 illustrates that the respondents tended to stay slightly more than one night in the Wilderness at Lake Aloha.

Half of the respondents stayed one night or less at Desolation Wilderness. Table 3.3 shows the skewed distribution. It is a positive skew suggesting that staying a long time at Lake Aloha is not so popular as staying a shorter time. Figure 3.3 illustrates it graphically.

Q3. How many nights did you stay at Lake Aloha?

Table 3.3. Nights spent at Lake Aloha.

Number of nights at Lake Aloha	Frequency	Percent	Cumulative
0	59	22.78	22.78
1	104	40.15	62.93
2	67	25.87	88.8
3	23	8.88	97.68
4	3	1.16	98.84
5	3	1.16	100.00
Total	**259**	**100.00**	

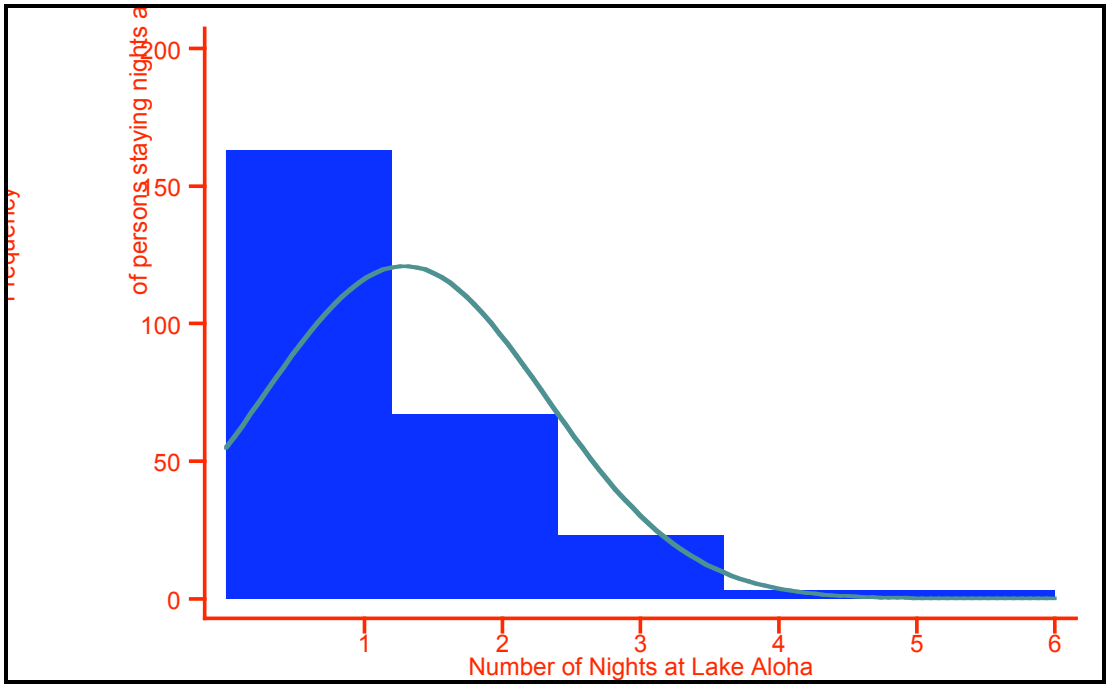

Figure 3.3

The information on entry and exit of the Desolation Wilderness makes for interesting reading. Most of the visitors stayed slightly more than one night. The average length of time is seen in Table 3.4 where the mean is 1.3 nights, and there is unit variance.

Table 3.4. Average length of time in Desolation Wilderness

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
No. of Nights	259	1.3	1.0	0	5

Table 3.5 shows a breakdown of the most frequently used days to go into the Wilderness during the five months of June through October. In general, except for June, there appear to be entrants for each of the days, but some of the days are higher in frequency than others. Using the calendar for 1999, we find that the entrants for June were on Sunday, Friday, and Saturday. The highest frequencies of entrants to the area for the month of July suggest that Thursday and Friday were the highest frequencies. In August, the highest frequencies of entrants were on Sunday and Monday of the week. September found Friday and Saturday the most frequent days for entry into the area, and for October Saturday, Friday were the two days most frequently used to enter the area.

Table 3.5. Entry Days to the Desolation Wilderness.

Months	Days Of Entry	Total Respondents By The Month	Highest Frequencies By Days	Average Of Highest Frequencies
June	20TH through 26TH	8	20TH, 25TH, 26TH	2
July	1st through 30th	59	22ND & 23RD	6
August	1st through 30th	93	20TH & 21ST	7.5
September	2nd through 30th	47	3rd & 4th	9
October	1st through 30th	17	2ND, 8TH, 15TH & 16TH	1.5

Primary Destination

For a slight majority of the respondents, Desolation Wilderness was the primary destination on their trip to the El Dorado Forest. Table 3.6 shows that pattern. Question 7 asks:

Q7. Was Desolation Wilderness your primary destination for this trip?

Yes
No

Table 3.6. Primary destination was Desolation Wilderness.

Desolation Wilderness as primary destination	Frequency	Percent	Cumulative
Yes	144	54.03	56.03
No	113	43.97	100.00
Total	**257**	**100.00**	

Table 3.6 shows the responses to the question about whether Desolation Wilderness was a primary destination for the vacationers, and slightly more than 56% indicated it was a primary target.

We cross tabulated the number of nights the respondents indicated they stayed over night at Lake Aloha with the question on primary destination being the Desolation Wilderness and we find that Lake Aloha appears to be a stop over on the way further into Desolation Wilderness. Table 3.7 shows those relationships. Of those who responded "no," Desolation Wilderness was not their primary destination, slightly more than 80% stayed at Lake Aloha one night or less, while those who indicated "yes" Desolation Wilderness was their primary destination almost 81% indicated that that they stayed two nights or less.

Table 3.8 shows the other locales where the respondents spent at least one night. The table is ordered from most to least frequent of the top 5 other sites for camping. Questions 4 and 7 provide the text for these responses in Tables 3.5 and 3.6.

Q4. Besides Lake Aloha, at <u>what other areas in Desolation Wilderness</u> did you spend the night? *[please see appendix A for the complete list of other locales]*

And

Q7. Was Desolation Wilderness your primary destination for this trip?

Yes
No

Table 3.7. Desolation Wilderness as a stop over.

Number of Nights at Lake Aloha	Desolation Wilderness Primary Destination		Total
	Yes	No	
0	13 9.15%	43 38.39%	56 22.05%
1	56 39.44%	47 41.96%	103 40.55%
2	46 32.39%	20 17.86%	66 25.98%
3	21 14.79%	2 1.79%	23 9.06%
4	3 2.11%	0 0.00%	3 1.18%
5	3 2.11%	0 0.00%	3 1.18%
Total	142 100.0%	112 100.00%	254 100.00%

Table 3.8 shows the other places visited by those 112 who responded that Desolation Wilderness was not their primary destination. Table 3.8 shows the top 5 locales by frequencies of response. This table accounts for the specific frequencies of response for almost 78% of the total set of responses to this questionnaire. The other, less frequently mentioned responses are listed below the table.

Table 3.8. Frequencies and percentages of persons visiting other locales.
(Ranked by highest five frequencies of responses. The sample size for this table is 112.)

Other Areas of Desolation Wilderness did you spend the night?	Frequencies of Responses	Percentages of responses who answered that Desolation Wilderness was not the primary destination
Lake of the Woods	**25**	**22.3**
Susie Lake	**20**	**17.9**
Velma Lake: Middle	**17**	**15.2**
Dicks Lake	**15**	**13.4**
Lake Schmidell	**11**	**9.8**
Total	**88**	**78.6% of this sub-sample of 112**

Twenty-seven of the respondents mentioned other locales in the area including:

- Heather Lake (8 responses)
- Pyramid Peak (6 responses)
- Tamarack and Jabu (5 responses each)
- Lake Lucille (4 responses)
- Rubicon, Velma Lake Lower, and Stony Ridge Lake (3 responses each)
- Campter Flat, Rockbound Lake, China Flat, Ropi Lake, Avalanche Lake, Lake Lois, Highland Lake, and Channel Lake (2 responses each)
- Claude Lake, Maud Lake, Grass Lake, Totem Lake, Horseshoe Lake, Triangle Lake, Grouse Lake, and American Lake (1 response each)

Gilmore Lake was not mentioned among these respondents who indicated that Lake Aloha was not their primary destination.

Traveling Companions

The median number of persons traveling together in the area of the Desolation Wilderness was 2, and the data is influenced by the fact that there are a small number of respondents who indicated that they were with 12 or more persons in their group. The mean for Question 5 is 3.1, but the median is 2. This distribution is positively skewed, as illustrated in Figure 3.4. As the reader can see in the graph, more than 84% of the respondents stated they were in a group of four persons or less when visiting the area.

Q5. How many persons were in your group on this trip? _____Persons

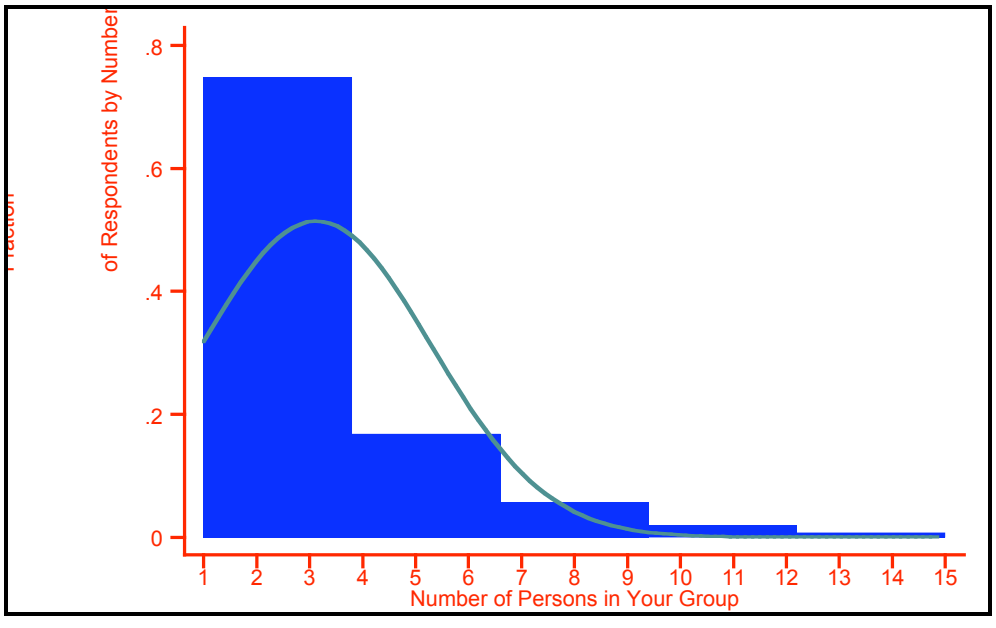

Figure 3.4

Table 3.9 provides more detail on the pattern of visitors in groups, and it shows the tabulated version of this skewed distribution. Notice how there are some substantial frequencies of high numbers of persons in the groups beyond 4 persons.

Table 3.9. Tabulation of groups visiting Lake Aloha.

Number of persons in group	Frequency	Percent	Cumulative
1	24	9.16	9.16
2	121	46.18	55.34
3	51	19.47	74.81
4	26	9.92	84.73
5	10	3.82	88.55
6	8	3.05	91.60
7	7	2.67	94.27
8	4	1.53	95.80
9	4	1.53	97.33
10	2	0.76	98.09
11	1	0.38	98.47
12	2	0.76	99.24
13	2	0.76	100.00
Total	**262**	**100.0**	

Distances Traveled By the Respondents to the Area

Those respondents who indicated they started their visit to the Wilderness from their permanent home had an average of 2.7 hours of travel to visit Lake Aloha. Table 3.10 shows that pattern. Notice that Table 3.10 shows only those who answered that they had started their trip from their permanent home. There are 194 respondents to this question; one who answered zero hours was excluded from further analysis on this question.

Q8. How many hours of travel time did it take from your house or last overnight stop to get to the trailhead where you entered Desolation Wilderness? _____Hours

Table 3.10. Hours of travel from permanent home to Lake Aloha of those who left from their permanent home to travel to Desolation Wilderness.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q8	193	2.746632	1.619422	.2	12

These data suggest that there is an approximate average distance of 2.7 hours x 40 mph = 108 miles for the respondents to go from either their permanent homes, or the last overnight stop, to their entry to the Desolation Wilderness. When we use the standard deviation with these data we find that slightly more than 68% of the respondents live within, or started from, a distance of (2.7 hours + 1.6 hours) x 40 mph = 175 miles or less from their entry to Desolation Wilderness.

Table 3.11 shows a categorized measure of the distance traveled by those who entered a trailhead in the Desolation Wilderness. A clear majority of the respondents indicated they had traveled between 50 and 180 miles to this destination. The shortest distance reported is .5 miles and the longest is 1,700 miles.

TABLE 3.11. Categorized distance traveled to enter Desolation Wilderness.

Categories of miles traveled to enter Desolation Wilderness	Frequency	Percent	Cumulative
30 miles or less	29	15.03	15.03
31 to 50 miles	14	7.25	22.28
50 to 180 miles	89	46.11	68.39
More than 180 miles	61	31.61	100.00
Total	**193**	**100.00**	

A clear majority of the respondents indicated that they had started their journey to the Wilderness from their permanent home. As Table 3.12 indicates over 75% of the respondents stated they started their trip from their home. Those who indicated that they started their trip from a location other than their own permanent home started predominantly from within California. Table 3.13 shows that distribution.

Of the 63 persons who stated they did not start from their home, South Lake Tahoe (12) was the most frequently mentioned place for their start and the next highest were Truckee (5) and San Francisco (4). Lake Tahoe and Sacramento had 3 persons each. The remaining 30 had combinations of 1 or 2 persons per site. Eighty-two percent of the respondents indicated they were from California; Nevada and Washington were the next two most frequently cited states for the visitors.

Table 3.12. Starting from a place other than one's home to visit the Wilderness.

Start trip from home	Frequency	Percent	Cumulative
Yes	196	75.1	75.1
No	65	24.9	100.00
Total	**261**	**100.00**	

Table 3.13. Starting point for those visitors to Desolation Wilderness who did not start from their permanent home.

State started from	Frequency	Percent	Cumulative
California	58	81.69	81.69
Alabama	1	1.41	83.1
Arizona	1	1.41	84.51
Nevada	4	5.63	90.14
Washington	3	4.23	94.37
Wisconsin	1	1.41	95.77
Virginia	1	1.41	97.18
Hawaii	1	1.41	98.59
Oregon	1	1.41	100.00
Total	**71**	**100.00**	

Differences in Distance Traveled to Get to the Wilderness Entry Points

Using Question 6, which asks the respondent to say whether they started from their permanent home or not, we found that there is a significant difference in traveling distances between those who had an intermediate stop on their way to the Wilderness and those who drove straight to it. Tables 3.14 and 3.15 show those averages.

Table 3.14. Average travel distance of those who left from their homes but did not stop in between.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q9	181	120.9033	89.07442	.5	660

Table 3.15. Average travel distance of those who left from their homes but stopped in between.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q9	60	64.50833	68.50074	.5	300

Those who indicated Desolation Wilderness as their primary destination traveled an average distance of 121 miles. Those who made a stop between their homes and Desolation Wilderness traveled an average of 65 miles.

A majority of the respondents, 57%, indicated that Desolation Wilderness was their primary focus of travel. Those are the respondents who answered “yes” to question 7:

Q7. Was Desolation Wilderness your primary destination for this trip?

Yes
No

We tested for differences between the distances reported by using the “t” distribution and we found that there is a significant difference between the two primary travel targets. We found that those who had Desolation Wilderness as their main target for travel had an average of 121 miles compared to those who did not have it as their primary target for travel. Table 3.16 shows the hypotheses and the results of the test.

Table 3.16. A “t” test of differences in distances traveled to enter Desolation Wilderness between those who had it as their primary destination of travel and those who did not.

Group	Obs	Mean	Std. Error	Std. Dev.	[95% Conf. Interval]	
Yes	181	120.9033	6.62085	89.07442	107.8389	133.9678
No	60	64.50833	8.843408	68.50074	46.81272	82.20395
Combined	241	106.8631	5.652956	87.75748	95.72733	117.9988
Diff.		56.39498	11.04724		34.53975	78.25021

Satterthwaite's degrees of freedom: 130.263
Ho: mean(yes) - mean(no) = diff = 0

Ha: diff < 0	Ha: diff ~= 0	Ha: diff > 0
t = 5.1049	t = 5.1049	t = 5.1049
P < t = 1.0000	P > |t| = 0.0000	P > t = 0.0000

The respondents were asked about the length of time it took them to get to the entry point for the Desolation Wilderness from their home or their last overnight stop on the trip, and it is slightly more than three hours of travel time. Table 3.17 shows that distribution.

Table 3.17. Length of travel time in hours.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Travel time	261	3.069349	7.556011	0	120

Question 8 was recoded into five categories of hourly driving time from the respondents' homes or last overnight stop to the Wilderness area. Table 3.18 shows that categorization, and it is clear that the average number of hours between two and four hours for these respondents.

Table 3.18. Categories of travel time to Desolation Wilderness.

Categories of hourly driving time to Wilderness	Frequency	Percent	Cumulative
Less than one hour	70	26.62	26.62
One hour to two hours	61	23.19	49.81
More than two hours to four hours	104	39.54	89.35
More than four hours to five hours	19	7.22	96.58
More than five hours	9	3.42	100.00
Total	**263**	**100.00**	

Two questions asked about trailheads they used to enter and leave the Destination Wilderness area. Tables 3.19 and 3.20 show those distributions. The questions are:

Q10. What trailhead did you use to enter Destination Wilderness?

Q11. What trailhead did you use to leave Destination Wilderness?

Table 3.19. Five most frequent entry points for the Desolation Wilderness.

Entry Points	Frequencies	Percentages of Total Responses
Echo Lake	**147**	**57.9**
Fallen Leaf Lake	**23**	**9.1**
Glen Alpine	**15**	**5.9**
Bayview	**7**	**2.8**
Eagle Falls	**7**	**2.8**
Lily Lake	**6**	**2.4**
Total of Top Five	**205**	**80.9****

* Using 254 respondents. Others did not answer.

** The remaining percentages are in the listing below this table, where the frequencies were so low they were not included in this table.

A list of the places that have frequencies of responses less than six includes:

- Wright's lake, Twin Bridges, Tamarack, Horsetail Falls (4 responses each)
- Ralston, Echo Summit, Tallack, Emerald Bay (3 responses each)
- Camp Sacramento, Granite Lake, Eagle Lake, above Big Lake, Baker Pass, Glenn Falls, Alpine, Pacific Coast Trail, Donner Summit, Ralston Peak, Loon Lake, Lyon's Creek, Echo Lake Water Taxi, Echo Chalet, Pyramid Creek, Strawberry Patch, top of Route 50, Twin Lakes, Rubicon (1 response each)

Table 3.20. Five most frequent exit points from the Desolation Wilderness.

Exit Points	Frequencies	Percentages of Total Respondents*
Echo Lake	**133**	**52.8**
Fallen Leaf Lake	**27**	**10.7**
Glen Alpine	**15**	**6.0**
Eagle Falls	**10**	**4.0**
Lilly Lake	**10**	**4.0**
Bay View	**7**	**2.4**
Horsetail Falls	**6**	**2.4**
Emerald Bay	**6**	**2.4**
Total of Top Five	**214**	**84.7****

* Using 252 respondents. Others did not answer.
** The remaining percentages are in the listing below this table, where the frequencies were so low they were not included in this table.

A list of the places that have frequencies of responses less than six includes:

- Wright's Lake (4 responses)
- Echo Summit, Meeks Bay, Tallack, Mt. Tallac, Eagle Lake, Tamarac, Pacific Coast Trail, Lyons Creek, Ralston, Twin Bridges, Top of Route 50 (2 responses each)
- Aloha Lake, Camp Sacramento, off 89 above the lake, Glen Falls, Alpine, Lady of Sierra Chapel, Ralston Peak, Loon Lake, Echo Lake Water Taxi, Echo Chalet, Pyramid Creek (1 response each)

SECTION 4 ACTIVITIES AT THE LAKE

This section of the report focuses on the responses to a number of questions about the respondents' activities at the lake, the reasons for visiting the area, and questions about the quality of the environment. In the case of the latter, question 17, the answers use a Likert scaling device for these questions. This is an ordered five-point scale ranging from very dissatisfied (a value of 1) to very satisfied (a value of 5). The middle part of the scale (a value of 3) is defined as neutral. Thus, average low values on the scale refer to dissatisfaction and average high values suggest there is satisfaction the attribute being asked about.

Question 12 asks about the kind of activities the respondent engaged in while at the lake. The stem of the question text follows, but the full array of choices is left for the end of the report in Appendix A where the full questionnaire is located.

Q12. In which of these activities did you participate at Lake Aloha during your most recent trip there? ***(Check all that apply)*** *[There are 18 choices and an "other"]*

Since these are multiple response questions, we will present only the information about the specific category being responded to out of the total sample responding. This means if the respondent mentioned the item as an activity, the percentages of respondents mentioning the activity is the percentage being reported. Table 4.1 represents the frequencies of activities by the respondents while in the Wilderness area. The percentages will be calculated from a base of 263, since these are coded in the computer as zeros or ones. Table 4.1 is ordered from most frequent to least frequent response. The listing after the table presents the "other" categories mentioned by the respondent.

There were 4.8 responses per person answering the questionnaire; this suggests that there are almost five categories of activities by these respondents while in the Wilderness, and this is suggestive of the area having significant attractions for recreational activities. Further the most frequent choices are for hiking and camping, with "just relaxing" coming in third.

There were 30 respondents who listed "Other" activities representing written in choices of things not on the activity list as presented below Table 4.1, and they are in order of the most to least frequent responses. When we add in the number of "other" responses we find that there are 4.9 activities mentioned by the respondents.

Table 4.1. Activities in the Wilderness area.

Activity	Frequencies	Percentages of Respondents. Base = 263
Hiking	234	89.0
Primitive Camping	217	82.5
Just Relaxing	189	71.9
Landscape Photography	132	50.2
Wildlife Observation	112	42.6
Swimming	109	41.4
Climbing	66	25.1
Sunbathing	63	24.0
Fishing	57	21.7
Picnicking	40	15.2
Nature Study	37	14.1
Running/jogging	4	1.5
Horseback Riding	1	0.4
Total	**1,261**	

NOTE: These are total responses to all possible choices.

Here is a list of "other" things people indicated they had engaged in during their stay in the Wilderness:

- Reading (4 responses)
- Backpacking (3 responses)
- Hiking and stargazing (2 responses)
- Sketching, skill development for youth, romance, boy scouting, snorkeling, spending time with child, group games, playing musical instruments, boating, wild flowers, identifying trees/flowers, rest stop, snowboarding, just being, enjoying the view, sleeping, enjoying desolation wilderness, rock skipping and meditation, and spiritual pursuits (1 response each)

When asked the next question in the survey, Q13, we find that the respondents had considerable focus on hiking. Slightly over half of the respondents felt that hiking was their primary activity. Table 4.2 shows those responses in tabulated form. Camping and "just relaxing" were a distant second and third. Since there are high numbers of responses only once, it might make sense to collapse some of these responses for efficiency, but provide a less detailed table. We did not do that because we felt that readers are more interested in the details on this matter than the more summarized measure might provide.

Q13. Of the activities you mentioned, which ones would you consider your primary and secondary activities while at Lake Aloha. (That is, the main and secondary activities that you participated in while you were there, other than camping.)

Table 4.2. Primary activities at Lake Aloha.

Primary activity	Frequency	Percent	Cumulative
Hiking	134	51.94	51.94
Camping	46	17.83	69.77
Photography	6	2.33	72.09
Fishing	8	3.10	75.19
Nature study	4	1.55	76.74
Just relaxing	32	12.40	89.15
Skill development training	1	0.39	89.53
Enjoying nature	1	0.39	89.92
Backpacking	8	3.10	93.02
Climbing	6	2.33	95.35
Quick overnight	1	0.39	95.74
Picnicking	1	0.39	96.12
Cooking	1	0.39	96.51
Escape mosquitoes	1	0.39	96.90
Sightseeing	2	0.78	97.67
Snowboarding	1	0.39	98.06
Horseback riding	1	0.39	98.45
Enjoy the view	1	0.39	98.84
Passing through	1	0.39	99.22
Water source	1	0.39	99.61
Meditation, spiritual pursuits	1	0.39	100.00
Total	**258**	**100.00**	

The secondary activity reported in the responses is more widely distributed from hiking to other complementary activities. Table 4.3 shows that distribution. Note that there are higher frequencies of such activities such as relaxing, fishing, and camping that are mentioned less frequently than in the tabulations of primary activities found in Table 4.3**.** There is a broader array of frequently mentioned items in the secondary activity scale (Table 4.3) than there is in the primary activity scale (Table 4.2).

Questions 14 and 15 ask about reasons for visiting Lake Aloha. Question 14 has a multiple-choice format and the full set of choices is listed in Appendix A. There are 13 choices that a respondent might make and one “other” response category.

Q14. For which of the following reasons did you choose Lake Aloha as a place to visit on this trip? (Check all that apply.)

Table 4.4 indicates that the most popular reason for choosing Lake Aloha is the scenic beauty of the area. Note that this is a multiple response question and it

Table 4.3. Secondary activities at Lake Aloha.

Secondary Activity	Frequency	Percent	Cumulative
Fishing	23	9.43	9.43
Relaxing	48	19.67	29.10
Hiking	48	19.67	48.77
Picnicking	5	2.05	50.82
Walking	2	0.82	51.64
Camping	28	11.48	63.11
Climbing Pyramid Peak	2	0.82	51.64
Photography	25	10.25	74.18
Nature study	5	2.05	76.23
Swimming	23	9.43	85.66
Romance	1	0.41	86.07
Climbing	8	3.28	89.34
Sunbathing	1	0.41	89.75
Snorkeling	1	0.41	90.16
Exploring	2	0.82	90.98
Wildlife observation	12	4.92	95.90
Bootskiing	1	0.41	96.31
Chilling	1	0.41	96.72
Study water presence, use, erosion	1	0.41	97.13
Have fun	1	0.41	97.54
Enjoying area	2	0.82	98.36
Star watching	1	0.41	98.77
Bird watching	1	0.41	99.18
Enjoying scenery	1	0.41	99.59
View	1	0.41	100.00
Total	**244**	**100.00**	

suggests that there are multiple reasons for enjoying the area. The table is ordered from the highest to lowest frequencies of response. Note further that these respondents picked on the average 4.2 of the choices presented to them. This is similar to the frequency of choices selected in Question 12. Scenic beauty, being near the water, convenient location, and “just like the area” appear to be the most popular reasons for visiting the Wilderness area.

Table 4.5 presents the “other” reasons for going to Lake Aloha. There are 40 responses and they tend not to exceed a frequency of three.

Table 4.4. Reasons for going to Lake Aloha.

Reasons for Going to Lake Aloha	Frequencies	Percentages of Respondents. Base = 263
Scenic beauty	217	82.5
Be near the water	139	52.9
Convenient location	123	46.8
Just like the area	121	46.0
Repeat visit	110	41.8
Easy access	99	37.6
Large lake	77	29.3
Wanted to experience new area	73	27.8
Recommended by someone	39	14.8
Dispersion of campsites	37	14.1
Group trip	31	11.8
Good fishing	16	6.1
To see object or attraction	16	6.1
Total	**1,098**	

When asked about the primary reason for going to Lake Aloha (Question 15), we find that scenic beauty and convenient location appear to be the two most frequently used reasons for choosing Lake Aloha for a destination. Table 4.6 shows those frequencies.

When asked about the secondary reason, the respondents indicated that scenic beauty and being near the water were the first and second most frequently cited reasons. Table 4.7 illustrates those distributions. Interestingly, there are several high frequencies associated with convenient location, or easy access that seem to be attractive to these respondents.

Question 16 asks about the level of the lake:

Q16. Did the water level of the lake influence your decision to camp at Lake Aloha?

Yes
No

As shown in Table 4.8 about 85% of the respondents said that the water level did not influence their decision to visit the lake.

Table 4.5. Other reasons for going to Lake Aloha.

Other Reasons for Choosing Lake Aloha	Frequency	Percent	Cumulative
Lake Aloha is mysteriously captivating	1	2.50	2.50
It is a very special place for me	2	5.00	7.50
Get away from loud behavior of car campers	1	2.50	10.00
Through hiking on Tahoe-Yosemite trail	1	2.50	12.50
Hike to nearby areas	2	5.00	25.00
Had a trail pass & 1. Aloha was distance	1	2.50	20.00
Read that swimming was good because of	2	5.00	25.00
On our route	3	7.50	32.50
Quick access/availability of permit on	1	2.50	35.00
Rest stop	1	2.50	37.50
Love the Sierra Wilderness area	1	2.50	40.00
It's so unique	1	2.50	42.50
Repeat visit	2	5.00	47.50
Most unusual lake formation in Desolation	1	2.50	50.00
Less windy/sheltered campsite	1	2.50	52.50
Less mosquitoes/escape mosquitoes	2	5.00	57.50
Physical hike	1	2.50	60.00
Backpacking trip	3	7.50	67.50
Watch meteor shower	1	2.50	70.00
Good base camping site	1	2.50	72.50
Bring son backpacking for first time	1	2.50	75.00
Easy access to other areas	1	2.50	77.50
Easy access on trails	1	2.50	80.00
Trail and people training my horse	1	2.50	82.50
No bears, or hardly any bears	1	2.50	85.00
Central location – near valley	1	2.50	87.50
Hike to beautiful area	1	2.50	90.00
Provide a loop-like from and back to e	1	2.50	92.50
Checking out pct	1	2.50	95.00
Winter camping	1	2.50	97.50
Close to Pyramid peak	1	2.50	100.00
Total	**40**	**100.00**	

Table 4.6. Primary reason for choosing Lake Aloha as a destination.

Primary reason	Frequency	Percent	Cumulative
Convenient location	25	9.88	9.88
Scenic beauty	104	41.11	50.99
Good fishing	5	1.98	52.96
I like the area	18	7.11	60.08
New area	15	5.93	66.01
Easy access	15	5.93	71.94
To stay 1 more night but hike out of cr	1	0.40	72.33
Repeat visits	5	1.98	74.31
On the trail from Echo to Meeks Bay	1	0.40	74.70
Group trip	5	1.98	76.68
Hiking on Tahoe Yosemite trail	1	0.40	77.08
Easy hike	2	0.79	77.87
Recommended	8	3.16	81.03
Climbing	1	0.40	81.42
Curious about it & was on the way	1	0.40	81.82
On our trail to Mosquito Pass	1	0.40	82.21
Area allows dogs	1	0.40	82.61
6 miles from trail head	1	0.40	83.00
My son likes the boat taxi	1	0.40	83.40
Swimming	1	0.40	83.79
On the way	7	2.77	86.56
Personal reason	1	0.40	86.96
Rest stop	1	0.40	87.35
Unique	1	0.40	87.75
See Pyramid peak	1	0.40	88.14
Large lake	5	1.98	90.12
Interesting lake formation	1	0.40	90.51
Dramatic ridge to traverse	1	0.40	90.91
Be near water	1	0.40	91.30
Access to other areas	2	0.79	92.09
Hiking	3	1.19	93.28
Scenic hike	1	0.40	93.68
Aloha fit our incremental mileage	1	0.40	94.07
Good base camping site	1	0.40	94.47
Other	1	0.40	94.86
Personal reasons	4	1.58	96.44
May campsites	1	0.40	96.84
Great surroundings	1	0.40	97.23
Had always wanted to go there	1	0.40	97.63
Other areas too crowded	2	0.79	98.42
Part of a loop trail	2	0.79	99.21
Picnic lunch	1	0.40	99.60
Close to Pyramid Peak	1	0.40	100.00
Total	**253**	**100.00**	

Table 4.7. Secondary reasons for choosing Lake Aloha as a destination.

Secondary reason	Frequency	Percent	Cumulative
Easy access	19	8.15	8.15
Personal reason: just like it	19	8.15	16.31
Be near water	32	13.73	30.04
Large lake	7	3.00	33.05
Location	6	2.58	35.62
Scenic beauty	61	26.18	61.80
Elevation, size, and small island	1	0.43	62.23
Convenient location	21	9.01	71.24
Dispersion of campsite	5	2.15	73.39
Snorkeling	1	0.43	73.82
Fishing	8	3.43	77.25
Wanted to experience new area	9	3.86	81.12
Group trip	2	0.86	81.97
Repeat visit	5	2.15	84.12
Like the area	7	3.00	87.12
Was on our way	1	0.43	87.55
Other areas too crowded	4	1.72	89.27
New area	5	2.15	91.42
Show to child	2	0.86	92.27
To facilitate discussions about water	1	0.43	92.70
Climbing	1	0.43	93.13
Recommended	2	0.86	93.99
Easy access with water taxi	1	0.43	94.42
New experience	2	0.86	95.28
View nature	1	0.43	95.71
Training	1	0.43	96.14
Used to be very few people	1	0.43	96.57
Easy hike	1	0.43	97.00
Swimming	1	0.43	97.42
Good first day distance from Echo entry	2	0.86	98.28
Checking out pot	1	0.43	98.71
Long hike to Mt. Tallac	1	0.43	99.14
Explore for skiing	1	0.43	99.57
Few people around	1	0.43	100.00
Total	**233**	**100.00**	

Table 4.8. Decision to camp at Lake Aloha as a partial function of lake level.

Water level influence decision to camp at Lake Aloha	Frequency	Percent	Cumulative
Yes	39	15.48	15.48
No	213	84.52	100.00
Total	**252**	**100.00**	

Perceptions of Environmental Quality at Lake Aloha

Question 17 asks:

On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied, how satisfied would you say you were with the following conditions at Lake Aloha? [circle the number that corresponds to your level of satisfaction with each condition]

Water Level
Visual Quality
Hiking Trails
Human Impacts on Vegetation
Campsite Conditions
Amount of Litter

Table 4.9 shows the average responses and standard deviations to these topics from the respondents. The minimum and maximum scores are presented also. Notice that two of the scores "visual quality" and "Hiking Trails" are scored at 4 or above. This means they are perceived as satisfying to very satisfying attributes in the area. All the other average scores are near 3.7 and they are "water level," "Campsite Conditions" and "Amount of Litter." One scale is below 3.5. It is "Human Impacts on Vegetation." The reader should note, also, that the standard deviations for those items scoring above 4 have the lowest variances. This means there is a high level of consistency among the respondents in their evaluation of the satisfaction of the items. The remaining four scores have higher variances and this suggests there is less consistency among the respondents for those items' averages.

Table 4.9. Averages and variances of responses to questions 17.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Water Level	249	3.71887	1.044033	1	5
Visual Quality	250	4.412	.865594	1	5
Hiking Trails	247	4.27530	.8489098	1	5
Human Impacts on Vegetation	250	3.448	1.021504	1	5
Campsite Conditions	238	3.79411	.9522608	1	5
Amount of Litter	248	3.78225	1.095153	1	5

Since these questions lend themselves to examining inter correlations, we decided to do a factor analysis of the responses. The purpose of this is to see if there are underlying dimensions of satisfaction among the respondents that can be summarized into one or two scores. We found that the correlations between the responses to these six questions can be summarized into one score for beauty of the area and one score for the human impact on the area. That technical material is located in Appendix B.

In addition to the factor analysis, we conducted a set of tests on the differences in the distributions of factor summary scores across respondents' personal background characteristics. The purpose is to find out if there are patterns in responses that can be related to the personal background characteristics in the data. We found that the persons who had visited Lake Aloha before were slightly more satisfied about the human impact on the area than were those who had not been there before. We found also that the summarized scores on the beauty and the human impact of Lake Aloha are well measured by the single question represented by Table 4.10.

When asked about their **overall** satisfaction with their visit to Lake Aloha, the respondents indicated that they were quite satisfied by the experience. Table 4.10 illustrates that. Further, note the high level of consistency in the responses, by the low standard deviation in the summary.

Table 4.10. Overall satisfaction with the respondents' most recent visit to Lake Aloha.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q20	253	4.359684	.8024486	1	5

The correlations between the two factor scores and this question 20 indicate a fairly high and independent assessment of the of satisfaction with the Lake. Table 4.11 presents those results: In each instance the probabilities of these relationships occurring by chance are below 1 in 10,000.

Table 4.11. Correlations between the two factor scores and the overall satisfaction question.

Variable	beautyt	humanst	
Overall Satisfaction Measure Q20.	0.5059	0.4154	1.0000

SECTION 5 PREVIOUS TRIPS TO DESOLATION WILDERNESS AND LAKE ALOHA

Almost 81% of the respondents had been to Desolation Wilderness before the trip in which they had responded to the mail out survey. Table 5.1 shows that distribution

Q22. Have you visited Desolation Wilderness before this trip?
Yes
No

If yes, how many trips (not counting this trip) have you made to Desolation Wilderness:

Q22-1 over the past 12 months?
Q22-2 over the past five years?

Table 5.1. Previous trips to Desolation Wilderness.

Previous Trips to Desolation Wilderness	Frequency	Percent	Cumulative
Yes	207	80.86	80.86
No	49	19.14	100.00
Total	**256**	**100.00**	

Those who answered "yes" to question 22 were asked how many trips they had made to the Desolation Wilderness in the past 12 months and then in the past 5 years; those responses are shown in Table 5.2. On the average, those who have visited in the past 12 months have made 2 trips. Over the past five years the average is almost 7. Since the likelihood of answering 100 times is low, we examined the database more carefully and found that is might be reasonable to assume that these respondents did travel to the area 100 times. The two respondents are 53 and 42 years of age, their last travel to the area before the current trip was in 1997 and 1998. They live near the area, and one might conclude they are travel guides to the area from this information. We decided on this data to keep the cases in the analysis.

Table 5.2. Frequencies of trips to Desolation Wilderness.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
q22-1	158	2.14557	2.951467	0	20
q22-2	171	6.631579	11.60268	0	100

Question 24 asks about the frequency of trips to Lake Aloha in the past twelve months and then in the past five years. The text of the question follows:

Q24. Not counting this trip, how many trips have you made to Lake Aloha:

Over the past 12 months?
Over the past 5 years?

Those respondents who indicated they had visited Lake Aloha in the past twelve months had visited it an average of once. Those who had visited over the past five years indicated they had visited it an average of slightly more than three times. Table 5.3 shows those different means. There is quite a bit of variation in the last measure, and note that the maximum number of visits in both of the questions is 19. This might be due to the fact that the question does not take into consideration the double counting that is possible in the way these questions are phrased.

Table 5.3. Average frequencies of visits to Lake Aloha over the past 12 months and the past five years.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
12 months	122	1.04918	1.906286	0	19
5 years	138	3.23913	3.121749	0	19

Since the correlations are stronger among those who visit a specific area over the recent twelve months and over the five years, in comparison with the weaker correlations between visiting the Desolation Wilderness and Lake Aloha, we might conclude that there is fair evidence that the locales are in high regard for repeated visits among this sample. Table 5.4 shows those correlations and their significance levels. Table 5.5 illustrates these relationships even further. In that cross tabulation table, the chi square value is 17.5 suggesting a probability of less than 1 out of 1,000 repeated trials on a chance basis.

In this sample six respondents indicated they had not visited either Desolation Wilderness or Lake Aloha in the past; the largest percentage of respondents had visited both in the past and they constituted almost 74% of the total sample. Slightly more than 23% of these respondents had been to Desolation Wilderness, but not to Lake Aloha in the past. Table 5.5 shows those frequencies. We cross tabulated the

Table 5.4. Correlations between visits to Desolation Wilderness and Lake Aloha over the past twelve months and the past five years.
(the values beneath each correlation represent the tests of significance)

Variable	Q22-1	Q22-2	Q24-1	Q24-2
Q22-1	1.0000			
Q22-2	0.8048 0.0000	1.0000		
Q24-1			1.0000	
Q24-2	0.2793 0.0036	0.2943 0.0007	0.6681 0.0000	1.0000

previous visits to Lake Aloha with the responses to previous visits to Desolation Wilderness and found that they are related. Those who have been in either locale also tend to go to the other site. Twenty three percent indicated they had been to Desolation Wilderness but not Lake Aloha.

Table 5.5. Cross tabulation of visits to Desolation Wilderness and Lake Aloha.
(cell percentages)

Previous Visit to Desolation Wilderness	Previous Visit to Lake Aloha		Total
	Yes	No	
Yes	156 73.93%	49 23.22%	205 97.16%
No	0 0.0%	6 2.84%	6 2.84%
Total	**156** **73.93%**	**55** **26.07%**	**211** **100.0%**

Pearson chi2(1) = 17.5163 Pr = 0.000
Cramer's V = 0.2881
gamma = 1.0000 ASE = 0.000

Those who have had the highest visitation rate have been those who responded that they had their last visit since1996. Table 5.6 lists those years. To lend some credence to the assertion by two of the respondents that they had visited the Wilderness 100 times, we find that the two persons did so in one year each, 1997 and 1998. This evidence suggests that either there was an error in the encoding of this data or that the respondents incorrectly wrote the number of times they had visited the locations. It is reasonable to throw those two cases out when measuring the frequencies of prior visits to these areas.

Q25. Not counting this trip, during what year was your last visit to Lake Aloha?

Table 5.6 shows that pattern of visits to the Lake since 1970, which is the earliest year mentioned by these respondents.

Table 5.6. Years in which last visits to Lake Aloha occurred.

Year of last visit to Lake Aloha	Frequency	Percent	Cumulative
1970	1	0.65	0.65
1973	1	0.65	1.31
1976	1	0.65	1.96
1977	1	0.65	2.61
1978	1	0.65	3.27
1980	2	1.31	4.58
1981	1	0.65	5.23
1982	3	1.96	7.19
1983	1	0.65	7.84
1984	1	0.65	8.50
1985	1	0.65	9.15
1986	1	0.65	9.80
1989	2	1.31	11.11
1990	3	1.96	13.07
1991	1	0.65	13.73
1992	3	1.96	15.69
1993	2	1.31	16.99
1994	8	5.23	22.22
1995	2	1.31	23.53
1996	10	6.54	30.07
1997	34	22.22	52.29
1998	50	32.68	84.97
1999	23	15.03	100.00
Total	**153**	**100.00**	

Figure 5.1 illustrates graphically the pattern found in Table 5.6. The respondents in this sample of persons visiting Lake Aloha in 1999 clearly shows a pattern of recent visitation there from 1994 onward. Slightly more than 76% of the respondents to this question have been to Lake Aloha previously since 1996.

Two questions asked about the number of persons the respondents expected to see and the number they preferred to see. Table 5.7 and 5.8 shows the tabulated responses to these two questions. The order of the responses was changed to coincide with an ordered measure. So now the codes read “I saw more than I expected to see and I saw about as many as I expected to see, with I saw fewer people than I expected to see.” This procedure allows for the use of an ordinal

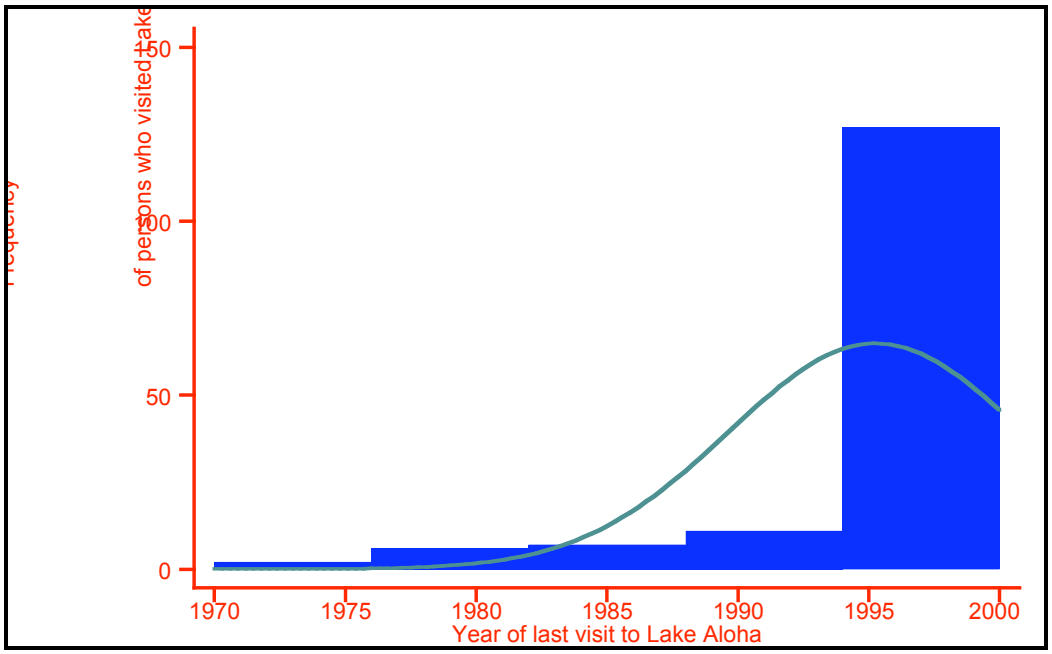

Figure 5.1

Table 5.7. Tabulations of number of persons expected to see.

Recoded q18 on expected number of persons	Frequency	Percent	Cumulative
See more	56	22.31	22.31
About as many	123	49.00	71.31
See fewer	72	28.69	100.00
Total	**251**	**100.00**	

Table 5.8. Tabulations of number of persons preferred to see.

Recoded q19 on preferred number of persons	Frequency	Percent	Cumulative
See more	100	40.00	40.00
About as many	123	49.20	89.20
See fewer	27	10.80	100.00
Total	**250**	**100.00**	

statistic which can provide us with a correlation between the two scores. In this way we might infer how expectations interact with preferences about the number of people in the area. We tested the relationships between the two new measures, now called *prefer* and *expect*, and we found no significant relationship between the two measures.

The questions follow:

Q18. Which of the three statements below best describes the number of people you expected to see at Lake Aloha on your most recent trip?

1. ***I saw about as many people as I expected to see***
2. ***I saw more people than I expected to see***
3. ***I saw fewer people than I expected to see***

Q19. Which of the following statements below best describes the number of people that you would have preferred to see at Lake Aloha on your most recent trip?

1. ***I saw about as many people as I wanted to see***
2. ***I saw more people than I wanted to see***
3. ***I saw fewer people than I wanted to see***

SECTION 6 ❖ CONCLUSIONS

1. First it should be noted that the sampling, questionnaire development and analysis represent the best professional work in these areas. The response rates to the mailed out questionnaire were quite high for a mail out procedure.

2. In general the respondents feel quite positive about their experiences in the Desolation Wilderness and at Lake Aloha.

3. The evidence in this data indicates that two separate questions appear to measure consistently the same attitude structure. This is a good outcome since it suggests that the respondents feel systematically positive about their experiences in the area.

4. The vacationers who participated in the activities appear to have a high number of activities. The average number of choices from the activity questions suggests that the respondents engaged in four or more activities while in the area.

5. Overall the respondents found the water level, the visual quality, and the hiking trails to be quite satisfying. Slightly less satisfying were perceptions of the human impact on the area.

6. A large number of visitors are repeat visitors.

7. On average, most drive about 3 hours to get to the Lake area.

APPENDIX A
MAIL OUT QUESTIONNAIRE FOR THOSE WHO VISITED LAKE ALOHA IN 1999

LAKE ALOHA SURVEY

Survey Research Center
California State University, Chico
Chico, California 95929

1-800-477-8783

LAKE ALOHA SURVEY

The Survey Research Center at California State University, Chico, is conducting a **study of recreation users at Lake Aloha** to find out about the different ways that people use this area. This information will help the U.S.D.A. Forest Service better manage recreation areas in the El Dorado National Forest, and will be used as part of the re-licensing for the El Dorado Hydro-electric Project. It only takes about ten to fifteen minutes for you to complete the survey.

The survey is divided into four sections:

Section 1 asks about your recent trip to the Desolation Wilderness during which Lake Aloha was one of your destinations. If you have made more than one trip to the Desolation Wilderness and Lake Aloha this year, please describe your **most recent trip**.

Section 2 asks about the time you spent at Lake Aloha on your more recent trip there.

Section 3 asks about your previous trips to the Desolation Wilderness and Lake Aloha.

Section 4 asks about you and your household for statistical purposes.

Instructions: **Please complete each question by filling in the blank, checking the box beside the answer that best applies to you, or by circling the response that best answers the question for you.**

Section 1: ABOUT YOUR TRIP

1. What month and day did you **enter** Desolation Wilderness **on your most recent visit**?

MONTH: _____
DAY: _____

2. What month and day did you **leave** Desolation Wilderness on your most recent visit?

MONTH: _____
DAY: _____

3. How many nights did you stay at Lake Aloha? _____ NIGHTS

4. Besides Lake Aloha, at what other areas in the Desolation Wilderness did you spend the night?

Lake Schmidel	Velma Lake: middle	Velma Lake: lower	Grouse Lake
Dicks Lake	Stony Ridge Lake	Lake of the Woods	Ropi Lake
Avalanche Lake	Lake Lois	Highland Lake	Campter Flat
Heather Lake	Rockbound Lake	Tamarack	China Flat
American Lake	Gilmore Lake	Lake Lucille	Horseshoe lake
Susie Lake	Triangle Lake	Jabu Lake	Maud Lake
Pyramid Aloha	Grass Lake	Channel Lake	Totem Lake
Rubicon Lake	Unknown Zone 9		

Other areas in Destination Wilderness where you spent the night (please write them in)

_____

5. How many persons were in your group on this trip? _____ PERSONS

6. Did you start this trip from your permanent home?

 YES
 NO

If NO, from where did you start your trip?

City/town: _____
State: _____
Zip code: _____
Country: _____

7. Was Desolation Wilderness your primary destination for this trip?

 YES
 NO

8. How many hours of traveling time did it take from your house or last overnight stop to get to the trailhead where you entered Desolation Wilderness? _____ HOURS

9. About how far in miles is it from your house or last overnight stop to the trailhead where you entered Desolation Wilderness? ____ MILES

10. What trailhead did you use to <u>enter</u> Desolation Wilderness?
_____

11. What trailhead did you use to <u>leave</u> Desolation Wilderness?
_____

Section 2: ABOUT YOUR TIME AT LAKE ALOHA

12. In which of these activities did you participate at Lake Aloha during your most recent trip there? (Check all that apply.)

Hiking	Swimming	Horseback riding	Kayaking/canoeing
Sailing	Other Boating	Other nature study	Bicycling
Wildlife observation	Picnicking	Running/jogging	Just relaxing
Camping (primitive)	Fishing	Sunbathing	Tubing
LandscapePhotography	Winter Play		

Other activities (please write them in)

_____

13. Of the activities you mentioned, which ones would you consider your **primary and secondary** activities while at Lake Aloha? (That is, the main and secondary activities that you participated in while you were there, other than camping.)

    Primary Activity: _____

    Secondary Activity: _____

14. For which of the following reasons did you choose Lake Aloha as a place to visit on this trip? (Check all that apply.)

Convenient location	Easy access	Scenic beauty
Group trip	Big lake	Good fishing
Repeat visit	Other areas too crowded	Be near water
Wanted to experience a new area	Recommended by somebody	
Personal reason: just like the area	To see an object or attraction	

Other (please specify)

_____

15. Which of these reasons would you say is the main and secondary reasons for choosing Lake Aloha as a destination for this trip?

    Primary Reason: _____

    Secondary Reason: _____

16. Did the water level of the lake influence your decision to camp at Lake Aloha?

    ☐ YES
    ☐ NO

17. On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied, how satisfied would you say you were with the following conditions at Lake Aloha: (**Circle the number that corresponds to your level of satisfaction with each condition.**)

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Water level	1	2	3	4	5
Visual quality	1	2	3	4	5
Hiking trails	1	2	3	4	5
Human impacts on vegetation	1	2	3	4	5
Campsite conditions	1	2	3	4	5
Amount of litter	1	2	3	4	5

18. Which one of the three statements below best **describes the number of people you expected to see** at Lake Aloha on your most recent trip?

- ☐ I saw ABOUT AS MANY people as I expected to see
- ☐ I saw MORE people than I expected to see
- ☐ I saw FEWER people than I expected to see

19. Which of the three statements below best describes **the number of people that you would have preferred to see** at Lake Aloha on your most recent trip?

- ☐ I saw ABOUT AS MANY people as I wanted to see
- ☐ I saw MORE people than I wanted to see
- ☐ I saw FEWER people than I wanted to see

20. On a scale of 1 to 5 with 1 being very dissatisfied and 5 being very satisfied, how satisfied were you, overall, with your most recent visit to Lake Aloha?

Very Dissatisfied				Very Satisfied
1	2	3	4	5

21. What **changes or improvements** would you like to see at Lake Aloha?

_____
_____
_____
_____

Section 3: ABOUT PREVIOUS TRIPS TO DESOLATION WILDERNESS AND LAKE ALOHA

22. Have you visited Desolation Wilderness before this trip?

 YES
 NO (SKIP to Question 26)

If YES, how many trips (not counting this trip) have you made to Desolation Wilderness:

Over the past 12 months? _____ TRIPS
Over the past 5 years? _____ TRIPS

23. Besides this trip, have you ever visited Lake Aloha before?

 YES
 NO (SKIP to Question 26)

24. Not counting this trip, how many trips have you made to Lake Aloha:

Over the past 12 months? ___ Trips
Over the past 5 years? ____ Trips

25. Not counting this trip, during what year was your last visit to Lake Aloha? _____

Section 4: ABOUT YOU AND YOUR HOUSEHOLD

These last few questions are for statistical purposes only. All of your answers will be kept strictly confidential. They will be combined with responses of other people who complete the survey and only reported as averages.

26. How many people are in your household? _____ PERSONS

Of these household members, how many are under the age of 18 years old? _____PERSONS

27. Do you have a disability?

- ☐ YES
- ☐ NO

28. In what year were you born? _____

29. Which cultural or ethnic group do you most closely identify with?

- ☐ Native American or Alaskan native
- ☐ Asian or Pacific Islander
- ☐ Black or African American, not of Hispanic origin
- ☐ Hispanic
- ☐ White, not of Hispanic origin
- ☐ Other _____

30. Which category best describes the highest education level that you have completed?

- ☐ High school not completed
- ☐ High school graduate
- ☐ Some college
- ☐ College graduate
- ☐ Graduate school or professional degree

31. Which category best describes your annual household income?

- ☐ Under $10,000
- ☐ $10,000-$19,999
- ☐ $20,000-$29,999
- ☐ $30,000-$39,999
- ☐ $40,000-$49,999
- ☐ $50,000-$59,999
- ☐ $60,000-$79,999
- ☐ $80,000-$99,999
- ☐ $100,000-$200,000
- ☐ More than $200,000

32. Would you like to provide any additional comments about Lake Aloha or this survey?

If you have questions about this survey, please call the CSU, Chico Survey Research Center at the following toll-free number: **1-800-477-8783**.

Thank you for completing the survey! **Please return it to the Survey Research Center in the enclosed postage-paid envelope.**

APPENDIX B
FACTOR ANALYSIS

APPENDIX B
Factor Analysis

The following material is derived from a factor analysis of the responses to question 17. The responses to this question require a Likert scaled choice that varies from being very dissatisfied to being very satisfied.

Q17 On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied, how satisfied would you say you were with the following conditions at Lake Aloha
(Circle the number that corresponds to your level of satisfaction with each condition)

Factor analysis is a useful statistical technique that allows us to summarize the answers to many questions in a survey. It is best done using a common measure such as we have with these questions, a scale of five points. In our factor analysis, described in detail below, we found that respondents tended to evaluate the beauty of the area more positively than they evaluated the human impact on Lake Aloha. As a result of our analysis the reader will see that the beauty of the area is best characterized by how satisfied the respondents are with the water level, visual quality, and hiking trails. The questions that measure the human impact on Lake Aloha tend to be those that ask about the satisfaction with human impacts on vegetation, campsite conditions, and the amount of litter.

Table 4.9 found in Section 4, page 28 indicates that the most satisfying set of responses is for the visual quality, with 4.4 average score and the second lowest variance of all the scores in the table. These averages are presented in the body of the report in Table 4.9. This means that there was a high level of consistency in responses to this characteristic. The lowest average score, meaning the least satisfying is 3.4 with a fairly large standard deviation, 1.02. This is for the question about human impacts on the vegetation. Overall, the respondents feel that the Lake Aloha area is quite satisfying with an average score of 4.4 and low standard deviation of .80. These measures were factor analyzed to find out if there is a correlation between the responses on the questions themselves.

The correlations of these measures indicate they are related. Table B1.1 shows those questions and their correlations. One might note that some of the relationships with high coefficients such as, 0.6078, are strong in their common relationships while others such as the coefficient of 0.0881, are weak.

We decided to do further analysis on these responses and carried out a factor analysis of Questions 17a-17f, which have the respective labels: satisfaction with water levels, visual quality, hiking trails, human impacts on vegetation, campsite conditions, and the amount of litter

Table B1.1. Correlations of Questions in q17.

(obs=233)

	q17a	q17b	q17c	q17d	q17e	q17f
q17a	1.0000					
q17b	0.5532	1.0000				
q17c	0.1773	0.3115	1.0000			
q17d	0.2580	0.2266	0.2550	1.0000		
q17e	0.1832	0.2207	0.3674	0.6078	1.0000	
q17f	0.0881	0.0898	0.1864	0.5208	0.5820	1.0000

We used the principal components factor analysis procedure in STATA7 and we set it to classify these patterns into two dimensions. We found the results presented in Table B1.2. There are two eigenvalues above 1, and this means we have a two-dimensional factor structure. In Table B1.2 the first two factors explain almost 66% of the common variance in the six questions. Inspection of the Cumulative column indicates that result. Further graphical presentation of the results is found in Figure B4.1. Notice the scree graph in this figure and how the line's slope diminishes as it moves across the horizontal axis. This suggests that the amount of added explanation drops at an eigenvalue of 1. The eigenvalue is a statistic that is used to "…indicate how much of the variation in the original group of variables is accounted for by a particular factor." [1] Graphically, this suggests there are two dimensions in these sets of questions.

Table B1.2. Factor Structure on Six Questions About the Characteristics of Lake Aloha.

(obs=233)

(principal component factors; 2 factors retained)

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	2.59018	1.23692	0.4317	0.4317
2	1.35326	0.53209	0.2255	0.6572
3	0.82118	0.35663	0.1369	0.7941
4	0.46454	0.04761	0.0774	0.8715
5	0.41693	0.06302	0.0695	0.9410
6	0.35391	.	0.0590	1.0000

[1] Vogt, W. Paul, Dictionary of Statistics and Methodology, (Newbury Park, CA: Sage Publications, 1993), p. 80.

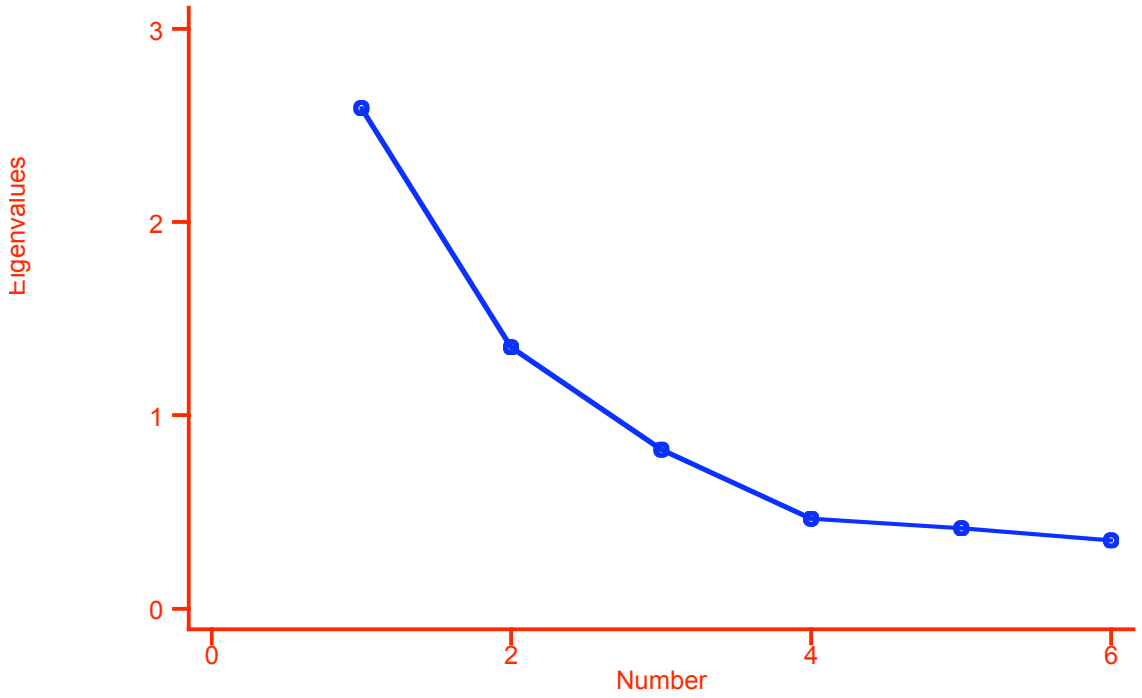

Figure B4.1

The next step in factor analysis is to rotate the factor structure to achieve a set of dimensions that are at 90° to each other. It seems reasonable to assume that these two sets of questions are asking about two separate attributes of an area. Using Varimax rotation on the original factor structure matrix does this procedure. This procedure was done to produce what is referred to in the literature on factor analysis as *simple structure* and it refers to the construction of a set of scores that represent a substantive criterion. In this case, the six questions appear to lend themselves to natural beauty and human impact questions. Table B1.3 shows that correlation between questions and the two dimensions. As Rummel suggests "…the Varimax criterion has by consensus become the best function for simple structure analytic rotation." [2]

From these procedures the analyst then constructs factor scores based on the two dimensions, in this instance. The procedure entails constructing the factor scores by using the proportion of a variables' involvement in a factor and weighting it by that relationship. Each respondent is then given a score distributed around the mean by the value of the respondent's choice on the original scale of responses. The sum of these scores becomes a measure that can be analyzed using such techniques as regression or analysis of variance.

We have two new variables that summarize the views of the visitors to the Lake in terms of summary scales. Since the factor scores tend to have zero means and unit

[2] Rummel, R.J. Applied Factor Analysis, (Evanston: Northwestern University Press, 1970) pp. 170-171.

Table B1.3. Two-Dimensional Factor Structure On Satisfaction Questions Regarding Lake Aloha.

(Varimax rotation)
Rotated Factor Loadings

Variable	Dimension 1	Dimension 2	Uniqueness
Water Level	0.07305	0.83636	0.29516
Visual Quality	0.09610	0.87104	0.23205
Hiking Trails	0.38764	0.42600	0.66826
Human Impacts on Vegetation	0.79651	0.20188	0.32482
Campsite Conditions	0.85795	0.15813	0.23891
Amount of Litter	0.83638	-0.05586	0.29736

variances, created a set of T scores. These are measures that shift the mean to 100 with a standard deviation of 10. In the process we can then more easily see the distributions of those persons who are not very satisfied and those persons who are quite satisfied on each of the two dimensions.

We transformed the factor scores by these equations:

Beautyt = (beauty/standard deviation)x 10 + 100

Humanst = (humans/standard deviation)x 10 +100

These procedures produced the averages of these scores as shown in Table B1.4. Notice that the mean is 100 and variance is 10. Notice also that the minimums is a respondent who has a score as low as 66.8 on the beauty dimension and another who has a score of 63 on the human impact dimension. There are also respondents who have very satisfying perceptions on the beauty of the area and on the human impact on the area. These are the maximum scores of 116.8 and 114.2. Each respondent now has a score that represents that respondent's summarized views of the lake based on their responses to the six questions asked in Question 17.

Table B1.4. Average T Scores for Factor Scores.

Variable	Obs	Mean	Std. Dev.	Min	Max
beautyt	233	100	10	66.82255	116.8571
humanst	233	100	9.999999	63.25106	114.2125

Those respondents who were more dissatisfied will tend to have scores below 100 and those who are more satisfied will tend to have scores above 100 on these two dimensions. Because we are using 100 as the mean we now can easily see what kind of people feel dissatisfied with aspects of Lake Aloha and what kind of people feel

satisfied with it using these two dimensions as variables that are dependent on background characteristics or experiences in the area.

We examined the differences in how respondents evaluated these two dimensions by using a method called analysis of variance. We examined the differences on these two dimensions by personal background characteristics such as income, age, and level of formal education. We found that there are no significant differences on the two dimensions across income categories, and formal educational levels. We found a significant difference using the the number of preferred persons in the area on the dimension labeled beauty.

As Table B1.5 indicates those who would have preferred to see more persons in the area had the lowest satisfaction with the beauty of the area. This suggests a counter intuitive perception of what is pleasing in the Desolation Wilderness area.

Table B1.5. One-Way Analysis of Variance for Beauty of the Area and Number of Persons Preferred to See.

```
recoded q19 |
         on |
  preferred |
  number of | Summary of T score on factor scores
    persons |        Mean   Std. Dev.       Freq.
------------+------------------------------------
   See More |   96.549956   11.214158          94
  About as  |   102.84432   8.2811085         112
  See Fewer |   99.690832   8.2639442          25
------------+------------------------------------
      Total |   99.941689   9.9941378         231

                       Analysis of Variance
    Source              SS         df      MS            F     Prob > F
------------------------------------------------------------------------
Between groups      2026.56297      2   1013.28148     11.03     0.0000
 Within groups      20946.4788    228   91.8705211
------------------------------------------------------------------------
    Total           22973.0418    230   99.8827903

Bartlett's test for equal variances:  chi2(2) =  10.2799  Prob>chi2 = 0.006

                   Comparison of T score on factor scores
                by recoded q19 on preferred number of persons
                                (Scheffe)
Row Mean-|
Col Mean |   See More   About as
---------+----------------------
About as |    6.29436
         |      0.000
         |
See Fewe |    3.14088   -3.15348
         |      0.348      0.333
```

We also found significant differences across categories of responses to Question 20. This is a global question asking about the respondent's overall evaluation of Lake Aloha. Table B1.6 indicates the differences when we examine the categories of responses from very dissatisfied, a very low response of 1, to very satisfied, a very high response of 121.

Table B1.6. Factor Score Differences of Beauty Across Overall Assessment of Lake Aloha.

```
    overall |
satisfactio |
     n with | Summary of T score on factor scores
      visit |        Mean   Std. Dev.       Freq.
------------+------------------------------------
  very diss |   69.018639           0           1
  dissatisf |   88.266646   12.563495           7
    neutral |   92.341874   8.7266348          19
  satisfied |   96.827406   8.9399165          85
  very sati |   104.36603   8.1490278         121
------------+------------------------------------
      Total |         100   9.9999999         233

                      Analysis of Variance
    Source              SS         df      MS            F     Prob > F
------------------------------------------------------------------------
Between groups      6199.92072      4   1549.98018     20.79     0.0000
 Within groups      17000.0787    228   74.5617485
------------------------------------------------------------------------
    Total           23199.9994    232   99.9999973

Bartlett's test for equal variances:  chi2(3) =   3.1056  Prob>chi2 = 0.376

note: Bartlett's test performed on cells with positive variance:
      1 single-observation cells not used

  Comparison of T score on factor scores by overall satisfaction with visit
                               (Scheffe)
Row Mean-|
Col Mean |   very dis   dissatis    neutral   satisfie
---------+--------------------------------------------
dissatis |     19.248
         |      0.364
         |
 neutral |    23.3232    4.07523
         |      0.144      0.888
         |
satisfie |    27.8088    8.56076    4.48553
         |      0.039      0.178      0.383
         |
very sat |    35.3474    16.0994    12.0242    7.53862
         |      0.003      0.000      0.000      0.000
```

Question 20 asks:

Q20 On a scale of 1 to 5 with 1 being very dissatisfied and 5 being very satisfied, how satisfied were you overall, with your most recent visit to Lake Aloha?

1. ***very dissatisfied***
2. ***dissatisfied***
3. ***neutral***
4. ***satisfied***
5. ***very satisfied***

As the Scheffe test reveals the systematic and significant differences are between those who indicated they were very satisfied and those who were neutral or dissatisfied on a global basis with the area. These results suggest an independent assessment of the value of the satisfaction questions in this survey using question 20 by itself. We found that the responses to question 20 are correlated with the T scored factor dimension measures we produced about the beauty and the human impact on Lake Aloha. We observe that the scores of those who felt generally satisfied with their experiences at Lake Aloha are also beyond 100 on the T scores measuring beauty of the Lake. Fifty-two percent of the respondents to question 20 indicated they were **very satisfied** with their most recent trip to Lake Aloha. And the factor T scores indicate that there is a difference between those who scored four through five and those who scored lower on the satisfaction measures found in Question 20.

Table B1.7 shows the same type of results using the summary of attitudes at the lake about the human impact. The significant Scheffe differences here are between those who responded at the very satisfied level and those who marked lesser scores at 2, 3, and 4. Again, these results suggest that the factor T score measures and the overall assessment of the respondents' satisfaction with Lake Aloha represent an independent assessment of satisfaction with the Lake.

Table B1.8 shows the correlations between question 20 and the two dimensions resulting from the factor scoring. It is clear from Table B1.8 that there are stronger correlations between the factor scores, beauty, human impact and question 20. These are significant at less than 1 out of 10,000 times. The correlation between beauty and human impact is low as it is expected to be since we used an orthogonal solution for the factor structure.

We next tested the differences between those who had visited Lake Aloha before the trip in which they were answering and those who had not visited Lake Aloha. We used the two factor scores: beauty and human impact. We found the only interpretable results with the human impact score. Table B1.9 shows those results. We see in Table B1.9 that the probability of the differences between the two groups is almost at a level of .05. It is .07, and generally, it might not be found significant, but we thought it would be useful to know about this in terms of management of the area. We inspect the means of the two groups and find that those who have been there before responded with a human

Table B1.7. Factors Score Differences of Human Impact Across Overall Assessment of Lake Aloha.

overall satisfaction with visit	Summary of T score on factor scores: Mean	Std. Dev.	Freq.
1	87.764992	0	1
2	87.093342	17.794108	7
3	91.694202	8.8786684	19
4	98.482971	9.5674755	85
5	103.21768	8.2246045	121
Total	100	9.9999995	233

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	4074.89444	4	1018.72361	12.14	0.0000
Within groups	19125.1031	228	83.8820309		
Total	23199.9975	232	99.9999892		

Bartlett's test for equal variances: chi2(3) = 11.3309 Prob>chi2 = 0.010
note: Bartlett's test performed on cells with positive variance:
1 single-observation cells not used

Comparison of T score on factor scores by overall satisfaction with visit (Scheffe)

Row Mean-Col Mean	1	2	3	4
2	-.671649			
	1.000			
3	3.92921	4.60086		
	0.996	0.863		
4	10.718	11.3896	6.78877	
	0.852	0.043	0.078	
5	15.4527	16.1243	11.5235	4.73471
	0.589	0.001	0.000	0.011

impact score that was higher than those who had not been there before. This means these people found the area more satisfying than did those who had not visited the area before. It is no surprise that only those people who are highly satisfied with the area will repeatedly visit it. The other test on beauty of the area did not reveal significant differences between those who had been there before and those who had not.

Table B1.8. Correlations Between Factors Scores and Question 20.

	beautyt	humanst	q20
beautyt	1.0000		
humanst	0.1474	1.0000	
	0.0244		
q20	0.5059	0.4154	1.0000
	0.0000	0.0000	

Table B1.9. "t" Test of Differences on the Human Impact Between Those Who Had Visited the Area Before the Interview and Those Who Had Not.

```
. ttest humanst, by(q22)

Two-sample t test with equal variances

------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     yes |     186    100.3952    .7270127    9.915132    98.96089    101.8295
      no |      42    97.87973    1.629829     10.5625    94.58823    101.1712
---------+--------------------------------------------------------------------
combined |     228    99.93182    .6663141    10.06112    98.61887    101.2448
---------+--------------------------------------------------------------------
    diff |            2.515464    1.714482               -.8629503    5.893879
------------------------------------------------------------------------------
Degrees of freedom: 226

                    Ho: mean(yes) - mean(no) = diff = 0

     Ha: diff < 0                 Ha: diff ~= 0                 Ha: diff > 0
       t =   1.4672                 t =   1.4672                  t =   1.4672
   P < t =   0.9281             P > |t| =   0.1437              P > t =   0.0719
```

Further, we correlated the frequencies of trips to the Lake and to the Wilderness with the satisfaction scores beautyt and humanst. We found that there is a very low correlation between these measures, and there is nothing significant with the frequencies of traveling there and satisfaction with the human impact on the area. There is one significant relationship with satisfaction of the beauty of the area and the frequencies of traveling there over the past 12 months. This correlation is negative, and it is difficult to interpret. It is possibly confounded by the recent the travel frequencies. Please note that in Table B1.10, the numeric value under the correlation coefficient is significant if it is equal to or less than .05. There are three correlations that meet that condition. The correlation between beauty of the area and human impact. There is also the correlation between beautyt and the responses of those persons who have been in the area in the past twelve months. A significant correlation also exists between the human impact and beauty of the area as noted earlier in this appendix.

Table B1.10. Correlation Matrix of Summary Satisfaction Scores and Frequencies of Going to Lake Aloha Within Twelve Months and Five Years.

```
. pwcorr five twelve humanst beautyt, sig p(.05)

             |     five   twelve  humanst  beautyt
-------------+------------------------------------
        five |   1.0000
             |
             |
      twelve |   0.6681   1.0000
             |   0.0000
             |
     humanst |                      1.0000
             |
             |
     beautyt |           -0.1885   0.1474   1.0000
             |            0.0486   0.0244
```