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

CONTINGENT USE ANALYSIS OF FOUR LAKES IN THE EL DORADO IRRIGATION DISTRICT

Prepared for the El Dorado Irrigation District

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SECTION 1 INTRODUCTION

This report presents findings from a study conducted to determine the impacts of varying water levels on recreational use around four lakes (Aloha, Caples, Echo, and Silver) in the El Dorado Irrigation District (EID) Project 184 area, which is located within the El Dorado National Forest in California. The study's focus is to determine how much user demand changes for recreational activities in Project 184 facilities and areas when water levels change. Typically, EID draws down water levels at the end of the summer season following Labor Day.

Regional and Economic Sciences (RES) utilized two sources of information to complete this study. The first was a face-to-face survey conducted around the four lakes between July 4 and September 2, 2002. "The Final Report on the Face-To-Face Interviews Conducted for the El Dorado Irrigation District, Summer 2002" presents an analysis of the findings from the face-to-face surveys. In this face-to-face study, interviewers were randomly assigned to the four lakes by day during the sampling period, by locations at the lakes, and by choices of whom to interview. A total of 1,267 face-to-face interviews were completed during the survey period.

The second source of information was a follow-up telephone survey that RES conducted between August 30 and September 19, 2002. As part of the face-to-face survey, interviewers asked if each respondent would be willing to be interviewed by telephone after they returned to their homes. Table 1.1 shows the percentages of those who agreed to the follow-up telephone interviews. Note that 66% indicated they could be called. Less than 2% were not able to determine whether they would be called or not. Thus, 837 households of the 1,267 represent the sampling frame for the follow-up telephone surveys. As an incentive, we offered each respondent $10 for completing the follow-up interviews.

Table 1.1. Willingness of on-site EID recreation users to participate in the follow-up telephone survey.

Q26. Will you let us call you?	Freq.	Percent
Yes	837	66.06
No	410	32.36
Don't Know	20	1.58
Total	1267	100.00

Type of study

This is a contingent use study. It is a variation on the contingent valuation studies that are sometimes conducted to estimate demand for services not sold in the market place, such as

fishing in a stream. Contingent valuation studies attempt to place a dollar value on the demand for the service by making inferences about the choices respondents make.

Readers' Caution

NOTE: When reading this report, please keep in mind that the number of respondents answering the questions will vary because of skip patterns. For example, if a respondent's answer indicates that he/she would go to another location because the water is too low for the types of activities that he/she enjoys at medium water levels, we did not ask him/her questions about the lake at low water levels. In some cases, when asked about water levels, respondents said they did not know even after our interviewers asked the question a second time in the same way. In those cases, we skipped to questions about another topic.

This report uses only the contingent use part of contingent valuation procedures. This means it is limited to estimating the impact on use or activities of changes in conditions without estimating the dollar value of the activities.

Telephone Interview Data Collection

We trained a total of eight interviewers on August 29 and 31. We pre-tested the interviews on August 31. After making some minor corrections to the survey instrument, we began interviewing on August 30. We interviewed daily through September 26 except for the following days: September 2, 11, 17, 18, and 19.

Table 1.2 shows a summary of our data collection efforts. We sent brochures to 739 of the 837 who agreed to follow-up telephone interviews, and 27 were returned with incorrect addresses. We called 26 respondents who did not have their brochures, and we mailed them a second brochure.

We completed 357 follow-up telephone interviews with the 739 who received brochures. Although we had only five refusals, we were not able to contact 18 due to incorrect telephone numbers. After subtracting the 5 refusals and the 18 incorrect telephone numbers, we made up to 6 callbacks to the remaining 359 telephone numbers. This yields a response rate of 51.8%. We left a maximum of three messages on answering machines or voice mail systems for those who could not be reached. There were no untouched telephone numbers among those who received brochures. A large number of calls were to answering machines, and, while we made up to six callbacks, 381 of them did not answer our efforts to contact them.

Compared to other general population telephone surveys, the response rate is quite high. In general, the respondents reached by telephone were quite willing to participate in the survey.

Table 1.2. Summary of telephone survey efforts.

Summary of EID Survey, Summer 2002	Number
Face-to-Face no agreement	410
Face-to-Face with telephone numbers	837
Brochures mailed	739
Brochures returned	27
Brochures sent second time	26
Completed telephone interviews	357
Incorrect telephone numbers	20
Corrected incorrect telephone numbers	2
Refusals	5
Maximum number of callbacks	7
Maximum number of messages	3
Untouched telephone numbers	0

Brochure with Photos of Three Water Levels

To complete the interview by telephone, respondents needed to refer to a brochure showing each of the four lakes at three different water levels (low, medium, and high). Presentation Graphics at California State University, Chico prepared the brochure under the guidance of RES. The graphic artist, Dyle Stoddard, used one photo of each lake and varied the water level using digital imaging. Water levels in each photograph were based on bathymetry data provided by the El Dorado Irrigation District. It was necessary to prepare the lake photos this way since RES could not find an actual photo of each lake taken from the same perspective showing the three different water levels. The brochure was prepared in color with a map of the forest and lakes included.

We mailed each brochure with a cover letter to every person who had agreed to participate in the follow-up telephone survey. RES mailed the brochure to the addresses the respondents provided to the field interviewers. About a week later, we began telephone calls to those respondents. The questionnaire ran on computers using Ci3 software, a computer-assisted telephone interviewing software program for Microsoft Windows operating systems.

Questions in Telephone Survey

Since we asked questions about four different lakes at three different water levels, there were 12 photos for the respondent to consider. We asked respondents about 14 recreational activities at Lake Aloha and 20 activities at the other lakes. (In order to get to Lake Aloha, it is necessary to hike in about five miles. Consequently, some activities such as boating, which is popular at the other lakes, are not feasible at Lake Aloha.) Questions about activities, experiences visiting the lakes, fishing behavior, and demographics resulted in over 350 questions. We did not ask every respondent all 350 questions since the logic of the questionnaire skip patterns resulted in skipping some questions for some respondents.

In addition to the questions about activities at the three different water levels, we also asked questions about the fishing behavior of those who stated they fished at the four lakes. This was done at the request of the California Department of Fish and Game, and we will present findings from these questions in a separate report. There are three fishing questions for each of the lakes. These questions were supplied by Fish and Game and incorporated directly into the questionnaire. There are also questions about what the respondents might do if they decided against visiting any of the four lakes at each water level.

Demographic questions on age, education, income, and gender make up the final set of questions in the telephone interview. Finally, two questions asked the interviewer to evaluate the behavior of the person being interviewed over the telephone.

Table 1.3 shows the interviewers' judgments about the behavior of the people interviewed. It indicates that almost all of the interviewees were very helpful and willing to answer the questions in this extensive survey.

Table 1.3. Interviewee behavior.

Which is correct about the person being interviewed	Freq.	Percent
Very helpful and willing to answer	346	96.92
Somewhat subdued	6	1.68
Somewhat hostile	5	1.40
Total	357	100.00

SECTION 2 ❖ DEMOGRAPHIC OF TELEPHONE vs. FACE-TO-FACE SAMPLE

In the telephone questionnaire, we obtained information on four demographic characteristics that are phrased to be identical to those found in the field interviews. These are gender, income, level of formal education, and age of the respondents. We found that the telephone respondents are, on the average, slightly more than one year older than the face-to-face respondents. We also found they had a slightly higher percentage of some college education (31.7%) than the face-to-face respondents (28.8%) interviewed in the field. Income is about the same for both groups. Overall, there is not much difference in demographics between those who were interviewed face-to-face and those who were interviewed by telephone.

Age

The 357 respondents interviewed by telephone are slightly more than one year older than the entire group of 837 who agreed to be interviewed by telephone when we interviewed them face-to-face. Table 2.1 shows that the average age of the persons interviewed by telephone is 48. In comparing this average age to the average age of those who agreed to be interviewed in the field, we find the confidence interval places this sample just slightly higher at the probability level of .05. Table 2.2 shows that result.

Table 2.1. Average (mean) age of telephone survey respondents.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Age1	353	48.14164	13.64411	18	89

Table 2.2. Confidence interval for age of the persons willing to be interviewed by telephone.

Variable	Obs	Mean	Std. Err.	[95% Conf. Interval]	
Age1	826	45.74213	.4442177	44.8702	46.61406

Education

There are higher percentages of respondents with some college education (31.7%) in the telephone survey than those who stated they would be interviewed when contacted in the field (24.4%). This is significant at the level of 3 times out of 100 repeated chances. Education is possibly correlated with the older age characteristics of this sample. They may

be in a group that has higher likelihoods of not completing a college degree. Table 2.3 shows the telephone sample levels of education. The Chi square value is 10.6 with four degrees of freedom, gamma is quite low, 0.09. This suggests that the relationship is quite weak.

Table 2.3. Level of education of those interviewed by telephone.

Q118. Which category best describes your formal education?	Freq.	Percent
High school not completed	5	1.40
High school completed	24	6.74
Some college	113	31.74
College graduate	120	33.71
Graduate or professional degree	94	26.40
Total	356	100.00

Income

The median incomes of those who agreed to be interviewed in the field and those who were interviewed by telephone are identical at a code 7. This code means that the respondents in both surveys reported annual household incomes of approximately $60,000 to $70,000.

SECTION 3 RESULTS

Lake Aloha

Activities

After mailing brochures to respondents showing the four lakes at high, medium, and low water levels, we began calling them for interviews. The respondents were asked to look at photos 1, 2, and 3 of Lake Aloha. Photo 1 shows Lake Aloha at its highest level, and photo 3 shows it at its lowest level. Lake Aloha drops 7.5 feet from high to medium, and it drops another 7.5 feet from medium to low. The list of activities for Lake Aloha is shorter than the lists for the other lakes since some activities, such as driving off-road vehicles, are not possible at Lake Aloha where visitors must hike about five miles to reach the lake. Our interviewers asked respondents if they engaged in any of the following 15 activities:

- Hiking
- Swimming
- Just Relaxing
- Picnicking
- Wildlife Observation
- Landscape Photography
- Primitive Camping
- Sunbathing
- Fishing
- Kayaking / Canoeing
- Other Nature Study
- Other Boating
- Running / Jogging
- Horseback Riding
- Tubing

If the respondent answered “yes,” the question for that activity was marked with a code of 1. Otherwise the code for that activity was 0.

Total Activities by Water Level

The total frequencies for all recreational activities at each water level at Lake Aloha are presented in Table 3.1. Notice that the mean activity level drops systematically from 6.3 at the high level to 4.2 as the level of the lake drops to the low level.

Figure 3.1 shows the decline in total activities that respondents reported for Lake Aloha as it drops from high to medium and medium to low level.

Table 3.1. Average number of activities mentioned per respondent at Lake Aloha.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Aloha High	298	6.281879	3.684677	0	15
Aloha Medium	297	5.414141	3.735359	0	15
Aloha Low	157	4.184713	3.722457	0	13

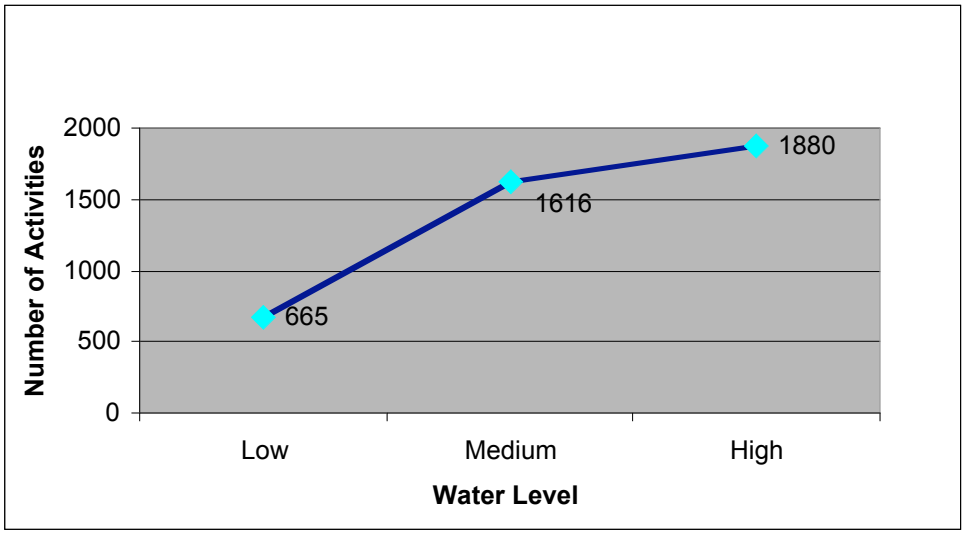

Figure 3.1. Total activities at Lake Aloha with Low, Medium, and High water levels.

NOTE: Remember that the number of respondents answering the questions varies because of skip patterns. For example, if a respondent's answer indicates that he/she would go to another location because the water is too low for the types of activities that he/she enjoys at the medium level, we did not ask him/her questions about the lake at low water level. Consequently, the number of respondents (observations) in each row in Table 3.1 varies.

Notice that the increase from low level to medium level is much greater than the increase from medium to high levels. There is a 143% increase from low to medium level and a 16% increase from medium to high level. The lake rises about 7.5 feet from low to medium and it increases another 7.5 feet from medium to high.

Table 3.2 shows the total number of activities chosen by telephone respondents for low, medium, and high water levels at Lake Aloha. We obtained these numbers by asking respondents if they would engage in each of the 15 activities listed in Table 3.2 at low,

Table 3.2. Total activities for Lake Aloha at Low, Medium, and High water levels.

Activity	Low	Medium	High
Hiking	105	228	250
Swimming	56	152	189
Just Relaxing	73	169	186
Picnicking	69	164	185
Wildlife Observation	66	143	162
Landscape Photography	57	134	155
Primitive Camping	57	116	141
Sunbathing	53	115	130
Fishing	35	135	124
Kayaking / Canoeing	19	65	100
Other Nature Study	41	85	93
Other Boating	6	22	48
Running / Jogging	14	35	41
Horseback Riding	8	30	38
Tubing	6	23	38
Total Activities	665	1616	1880

medium, and high water levels as they viewed photos 1, 2, and 3. Table 3.2 shows the number who answered “yes” for each activity at each water level.

Five Most Frequent Activities

RES examined the five most frequently chosen activities at Lake Aloha. We found that they are, in order of highest to lowest, hiking, swimming, just relaxing, picnicking, and wildlife observation (Figure 3.2). They are the first five activities listed in Table 3.2 also. Hiking is the most frequently cited. This is likely because almost everyone, except those riding horses, hike about five miles to get to Lake Aloha. Note that even non-water-based activities, such as hiking and picnicking, increase with lower water levels though water-related activities, such as swimming and fishing, have the greatest increase.

Aquatic and Land-Based Activities

We divided the 15 recreational activities into water-based and land-based summaries in order to compare them over the three different water levels. The water-based activities are the sums of “yes” responses to the following six choices. We calculated aquatic measures by summing the types of activities that are associated with water-based recreation. The aquatic activity measure consists of the following six choices:

- Swimming
- Kayaking / Canoeing

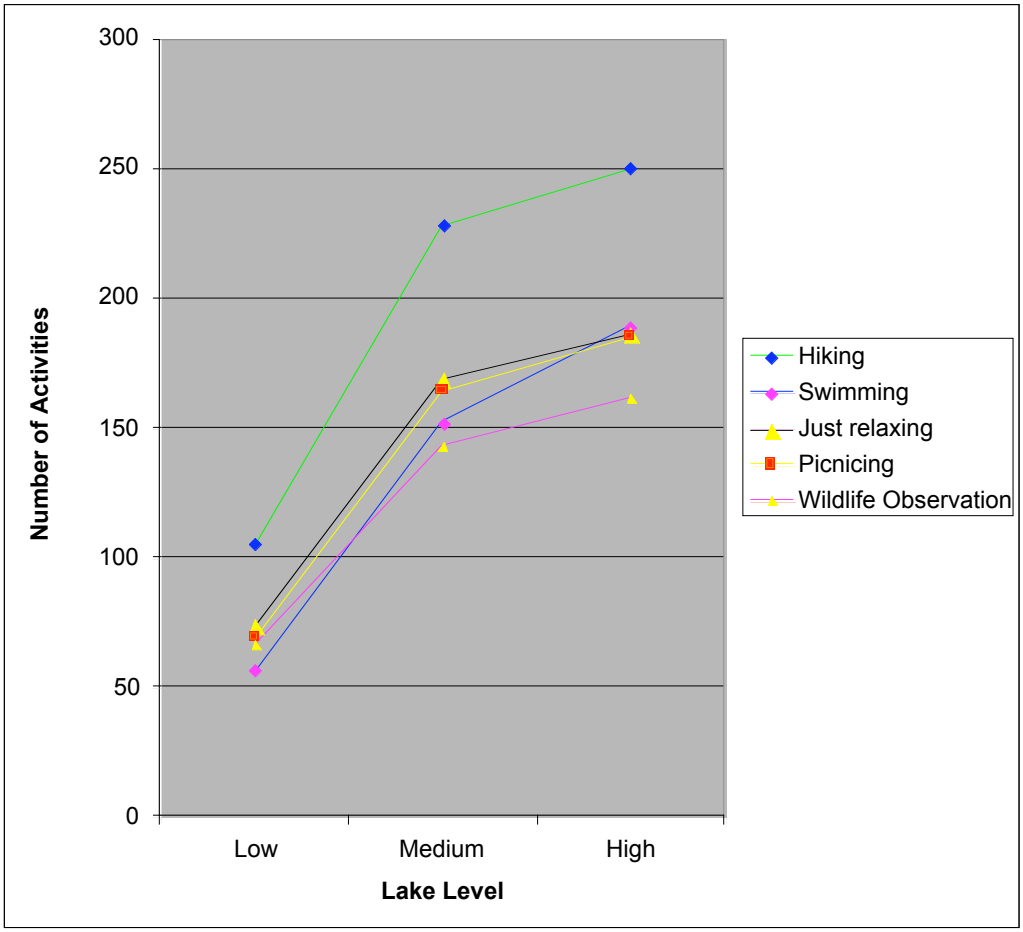

Figure 3.2. Five most frequently mentioned activities at Lake Aloha with High, Medium, and Low water levels.

- Other Boating
- Tubing
- Sunbathing
- Fishing

There are ten different activities for land-based recreational use:

- Hiking
- Just Relaxing
- Picnicking
- Wildlife Observation
- Landscape Photography
- Primitive Camping
- Other Nature Study
- Running
- Jogging
- Horseback Riding

When we examine the summary data (Table 3.3) on the activities broken into aquatic activities and land-based activities, we find that, as the water level increases, there is an increase in the activities for both aquatic and the land-based activities. However, water-based activities increase more rapidly than land-based activities as the water level rises. Land-based activities (ten items) have more total choices of activities in comparison with aquatic activities (six items).

Table 3.3. Change in activities and change in water level at Lake Aloha.

Change in Photo Water Level	Change Water-based activities	Change Land-based activities
Low to Medium	263%	125%
Medium to High	24%	14%

Table 3.4 shows the changes in the average number of aquatic activities mentioned per respondent at Lake Aloha at low, medium, and high water levels. The names “aquatic low” through “aquatic high” represents the summation of all the choices representing the use of water for recreation. Notice that for water-based activities, the number starts at slightly more than 1 at low and increases to slightly more than 2 activities at high water level.

Table 3.4. Average number of aquatic activities mentioned by respondent at Lake Aloha.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Aquatic High	298	2.104027	1.401989	0	6
Aquatic Medium	297	1.713805	1.381188	0	6
Aquatic Low	157	1.095541	1.28494	0	5

Table 3.5 shows the pattern for land-based recreational activities. The names “land low” through “land high” represent the summation of all choices for the use of land-based recreation activities. The average number of activities mentioned per respondent increases from slightly more than 3 activities to slightly more than 4 activities when the water level rises from low to high.

Table 3.5. Average number of land-based activities mentioned by respondent at Lake Aloha.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Land High	299	4.183946	2.691575	0	9
Land Medium	299	3.692308	2.746378	0	9
Land Low	158	3.101266	2.810784	0	9

Overall Enjoyment for Activities

We asked respondents to evaluate the water level for the types of activities they normally do. They had the choices of "too low," "about right" and "too high." The fourth response was "it doesn't matter to me." Across all the combinations of lakes and levels, this response was not more than four. Table 3.6 shows the number of respondents who thought the water level was "about right" for the types of activities they normally do at Lake Aloha at low, medium, and high water levels. There is a rather sharp rise in the number judging the water to be "about right" as the water level increases.

Table 3.6. Overall enjoyment for types of activities at Aloha Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 1 – highest level)	296	94.9	312
About right (Photo 2 – medium level)	124	40.9	303
About right (Photo 3 – lowest level)	21	10.1	209

Visual Enjoyment

We asked respondents if the water level in the lake was about right, too high, or too low for their visual enjoyment. Figure 3.3 shows that the largest number of respondents, 284, found the water level "about right" when viewing the photo of Lake Aloha at high water level. Only 99 found the medium level "about right," and just 24 evaluated the low level as "about right."

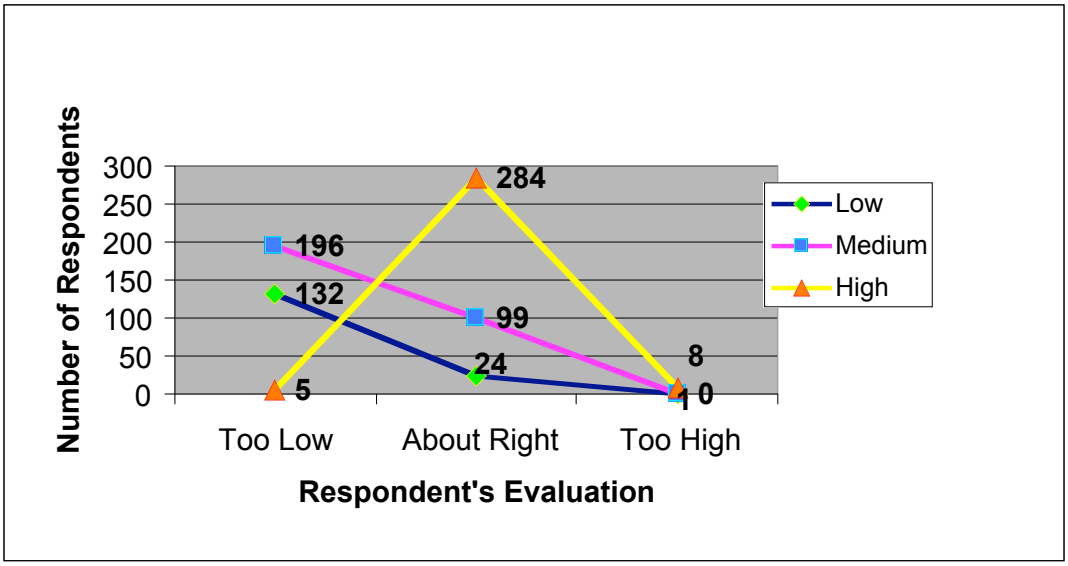

Figure 3.3. Evaluation of water level for visual enjoyment at Lake Aloha using photos of Low, Medium, and High water levels.

What Would You Do?

We asked respondents what they would do if the water level were the same as in the photo. Interviewers read the following choices: go to Lake Aloha, go to another location in the Desolation Wilderness Area (DW), go to another location, stay at home, or do something else. Table 3.7 shows the responses for Lake Aloha. In the "Total" column, note that 48 drop out at low level and 140 drop out at medium level.

Table 3.7 shows that about one-fifth of the respondents who answered this question would go to another location in the DW if the water level were low. If the water level were low, almost one-third would go to another location in the Desolation Wilderness Area. According to our interviewer, many people, who looked at Lake Aloha when the water was low in August, told him that they were hiking to another lake. Several of them commented about the mud around the lake at low water levels.

Table 3.7. What would you do if the water were at the level in the photo? (Frequencies and percentages)

Water level	Go to Aloha		Go to another location in DW		Go to another location		Stay home		Do something else		Total	# who will no longer go to Aloha	% who will no longer to go Aloha
Survey	#	%	#	%	#	%	#	%	#	%	#	#	%
Low		61		3								48	38.7%
Medium	1	5		2								140	47.0%

We asked a question about how the respondent might feel about the water levels depicted at each lake at three different levels. The respondents had the choices of "too low," "about right" and "too high." The fourth response was "it doesn't matter to me." Across all the combinations of lakes and levels, this response was not more than four. Table 3.8 shows all the combinations of water levels for the response "about right." As the water level drops the perceptions of "about right" drop most between photo 1 and photo 2. The percentage of recreation visitors who said the water level is "about right" dropped from 93.6% (Photo 1) to only 27.5% (Photo 2).

Table 3.8. Evaluation of water levels at Lake Aloha.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 1 – highest level)	277	93.6	296
About right (Photo 2 – medium level)	82	27.5	298
About right (Photo 3 – lowest level)	12	7.7	155

We used the same procedures for presenting the information about Caples Lake as for Lake Aloha. Photos 4, 5, and 6 show the changes in the water level at this lake. These three photos show the lake at high, medium, and low water levels in the brochure.

Activities

The respondents were asked to look at photos 4, 5, and 6 of Caples Lake. Photo 4 shows Caples at its highest level, and photo 6 shows it at its lowest level. Caples drops 28 feet from high to medium, and it drops another 28 feet from medium to low. The list of activities for Caples Lake is longer than for Lake Aloha since some activities, such as driving off-road vehicles, are not possible at Lake Aloha where visitors must hike about five miles to reach it. Our interviewers asked respondents if they engaged in any of the following 20 activities:

- Hiking
- Swimming
- Just Relaxing
- Picnicking
- Wildlife Observation
- Landscape Photography
- Primitive Camping
- Sunbathing
- Fishing
- Kayaking / Canoeing
- Other Nature Study
- Other Boating
- Running / Jogging
- Horseback Riding
- Tubing
- Motor Boating
- Developed Camping
- Bicycling
- Backpacking
- Driving Off-road Vehicles

If the respondent answered “yes,” the question for that activity is marked with a code of 1. Otherwise the coding is zero.

Total Activities by Water Level

The total frequencies for each water level at Caples Lake are presented in Table 3.9. It shows that activities increase as the water level rises. Notice that the mean activity level increases systematically from 4.0 to 7.2 as the level of the lake increases.

Table 3.9. Average number of activities mentioned per respondent at Caples Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Caples High	313	7.204473	5.055751	1	20
Caples Medium	304	6.177632	4.923309	0	20
Caples Low	210	3.971429	4.537894	0	20

Notice that the increase from low to medium levels in Figure 3.4 is much greater than the increase from medium to high levels. There is a 125% increase in activities from low to medium and a 20% increase from medium to high. The lake rises 28 feet from low to medium and another 28 feet from medium to high level.

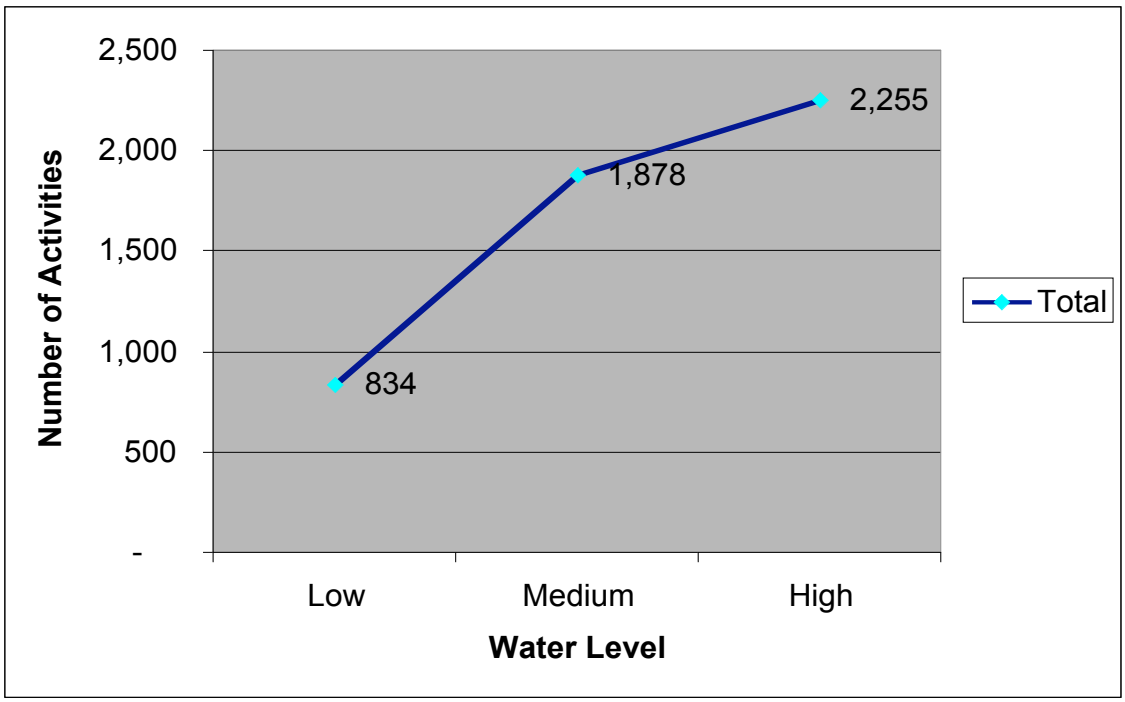

Figure. 3.4. Total activities at Caples Lake with Low, Medium, and High water levels.

Table 3.10 shows the total number of activities chosen by telephone respondents for high, medium, and low water levels at Caples Lake. We obtained these numbers by asking respondents if they would engage in each of the 20 activities listed in Table 3.10 at low, medium, and high water levels as they viewed photos 4, 5, and 6. Table 3.10 shows the number who answered “yes” for each activity at each water level.

Table 3.10. Total activities for Caples Lake at Low, Medium and High water levels.

Activity	Low	Medium	High
Hiking	106	211	244
Fishing	82	173	210
Picnicking	76	162	186
Just Relaxing	75	150	172
Swimming	48	126	161
Wildlife Observation	65	135	153
Landscape Photography	54	125	149
Kayaking / Canoeing	42	109	141
Primitive Camping	45	94	116
Developed Camping	37	91	111
Sunbathing	41	90	108
Other Nature Study	39	80	92
Motor Boating	26	69	92
Bicycling	28	60	66
Horseback Riding	13	40	54
Other Boating	10	40	53
Tubing	9	35	46
Running / Jogging	14	32	40
Off-road vehicles	16	31	34
Water Skiing	8	19	30
Total Activities	834	1878	2255

Five Most Frequently Mentioned Activities

Figure 3.5 shows the increase in the five most frequently mentioned activities that respondents reported for Caples Lake as it rises from low to medium and from medium to high levels. Note that hiking is the most popular, followed by fishing, picnicking, just relaxing, and swimming.

Aquatic and Land-Based Activities

We calculated aquatic measures by summing the types of activities associated with water-based recreation. The aquatic measure consists of the following eight activities:

- Sunbathing
- Swimming
- Kayaking / Canoeing
- Other Boating
- Tubing
- Water Skiing
- Fishing
- Motor Boating

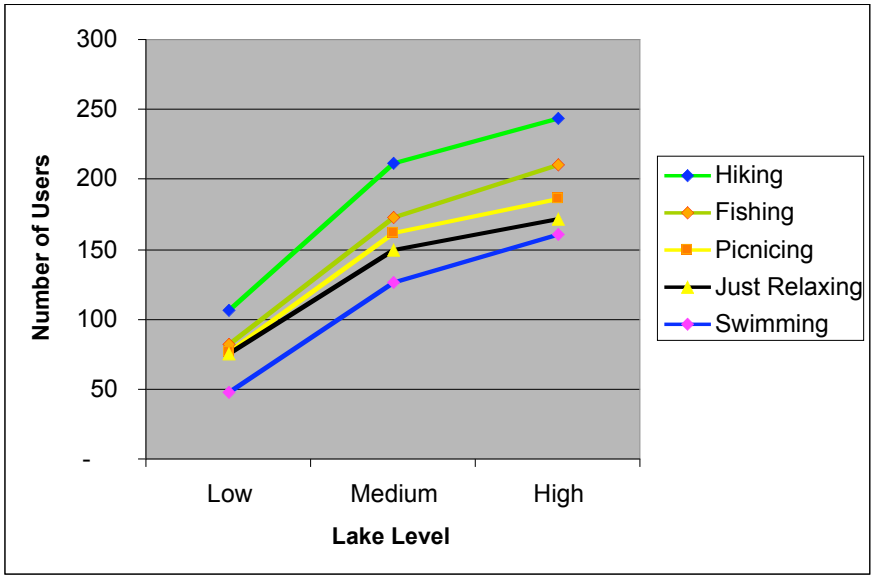

Figure 3.5. Five most frequently mentioned activities at Caples Lake with High, Medium, and Low water levels.

We also calculated a land-based activity scale which summed the "yes" responses to the following choices:

- Hiking
- Wildlife Observation
- Horseback Riding
- Other Nature Study
- Landscape Photography
- Picnicking
- Primitive Camping
- Developed Camping
- Running Jogging
- Just Relaxing
- Bicycling
- Off-road Vehicles

When we examine the summary data (Table 3.11) on the activities broken into aquatic activities and land-based activities, we find that, as the water level increases, there is an increase in the activities for both the aquatic and the land-based activities. However, water-based activities increase at a faster rate than land-based as the water level rises.

Table 3.12 shows the changes in the average number of water-based activities mentioned per respondent at Caples Lake at low, medium, and high water levels. The names "Caples low" through "Caples high" represent the summation of all the choices representing the use of water for recreation. Notice that for water-based activities the number starts at 1.3 and increases to 2.7.

Table 3.11. Change in activities and change in water level at Caples Lake.

Change in Photo Water Level	Change Water-based activities	Change Land-based activities
Low to Medium	151%	114%
Medium to High	26%	16%

Table 3.12. Average number of aquatic activities mentioned by respondent at Caples Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Caples High	313	2.677316	1.98908	0	8
Caples Medium	304	2.174342	1.889488	0	8
Caples Low	210	1.266667	1.690201	0	8

Table 3.13 shows the pattern for land-based recreational activities. The names “Caples low” through “Caples high” represent the summation of all choices for the use of land-based recreational activities. The average number of activities mentioned per respondent increases from 2.7 activities to 4.5 activities when the water level rises from low to high.

Table 3.13. Average number of land-based activities mentioned by respondent at Caples Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Caples High	313	4.527157	3.458555	0	12
Caples Medium	304	4.003289	3.44643	0	12
Caples Low	210	2.704762	3.217547	0	12

Overall Enjoyment for Activities

We asked respondents to evaluate the water level for the types of activities they normally do. They had the choices of “too low,” “about right” and “too high” The fourth response was “it doesn’t matter to me.” Across all the combinations of lakes and levels, this response was not more than four. Table 3.14 shows the number of respondents who thought the water level was “about right” for the types of activities they normally do at Caples Lake at high, medium, and low water levels. There is a rather sharp drop in the number judging the water to be “about right” as the water level drops.

Table 3.14. Overall enjoyment for types of activities at Caples Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 4 – highest level)	296	94.2	311
About right (Photo 5 – medium level)	120	39.6	303
About right (Photo 6 – lowest level)	24	11.5	208

Visual Enjoyment

We asked respondents if the water in the lake was about right, too high, or too low for their visual enjoyment. Figure 3.6 shows that the largest number of respondents, 304, or almost 98%, found the water level "about right" when viewing the photo of Caples Lake using photo 4 (high water level). That value drops to a minority of 120 (39.6%) when photo 5 (medium water level) is viewed. At the lowest level we find that the "about right" group is 24, or 11.5%.

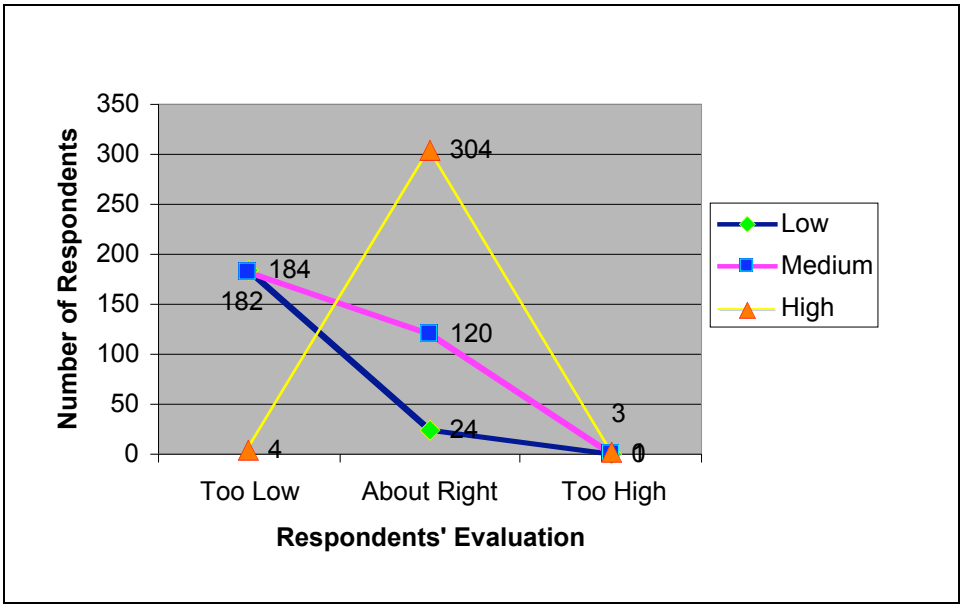

Figure 3.6. Evaluation of water level for visual enjoyment at Caples Lake using photos of Low, Medium, and High water levels.

What Would You Do?

We asked respondents what they would do if the water level were the same as in the photos 4, 5, and 6. Interviewers read the following choices: go to Caples Lake, go to another location, stay at home, or do something else. Note that 100 drop out when the water level decreases from high to medium and another 139 drop out when the lake drops from medium to low This is a decline of about one-third from high to medium and about two-thirds from medium to low (Table 3.15).

Table 3.15. What would you do if the water were at the level in the photo? (Frequencies and percentages)

Water level	Go to Caples		Go to another location		Stay home		Do something else		Total	# who will no longer go to Caples	% who will no longer to go Caples
Survey	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**#**	**%**
Low	66	32			5		28			139	67.8
Medium	201	6			0		9			100	33.2
High	30	9			1		2			9	2.9

We asked a question about how the respondent might feel about the water levels depicted at each lake at three different levels. The respondents had the choices of “too low,” “about right” and “too high” The fourth response was “it doesn’t matter to me.” Across all the combinations of lakes and levels, this response was not more than four. Table 3.16 shows all the combinations of water levels for the response “about right.” Note that the greatest amount of decline is between photo 4 (high water level) and photo 5 (medium water level) at Caples Lake.

NOTE: Remember that the number of respondents answering the questions varies because of skip patterns. For example, if a respondent’s answer indicates that he/she would go to another location because the water is too low for the types of activities that he/she enjoys at the medium level, we did not ask him/her questions about the lake at low water level.

Table 3.16. Evaluation of water levels at Caples Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 4 – highest level)	296	94.9	312
About right (Photo 5 – medium level)	124	40.9	303
About right (Photo 6 – lowest level)	24	11.5	208

We used the same procedures for presenting the information about Echo Lake as in the two lakes (Aloha and Caples) already discussed in this report. Photos 7, 8, and 9 show the changes in the water level at Echo Lake. These three photos show the lake at high, medium, and low water levels in the brochure.

Activities

The respondents were asked to look at photos 7, 8, and 9 of Echo Lake. Photo 7 shows Echo at its highest level, and photo 9 shows it at its lowest level. Echo drops three feet from high to medium, and it drops another three feet from medium to low. Our interviewers asked respondents if they engaged in any of the following 20 recreation activities (this is the same list used for Caples and Silver lakes):

- Hiking
- Swimming
- Just Relaxing
- Picnicking
- Wildlife Observation
- Landscape Photography
- Primitive Camping
- Sunbathing
- Fishing
- Kayaking / Canoeing
- Other Nature Study
- Other Boating
- Running / Jogging
- Horseback Riding
- Tubing
- Motor Boating
- Developed Camping
- Bicycling
- Backpacking
- Driving Off-road Vehicles

If the respondent answered “yes,” the question for that activity is marked with a code of 1. Otherwise the code was marked as 0.

Total Activities by Water Level

Table 3.17 shows that the average number of activities at Echo Lake drops from 7.6 to 6.4 as the water level drops from high to low.

Table 3.17. Average number of activities mentioned per respondent at Echo Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Echo High	284	7.616197	5.242921	0	20
Echo Medium	270	7.362963	5.215943	0	20
Echo Low	239	6.405858	5.13827	0	20

Figure 3.7 shows the increase in total activities from low to medium to high water levels. Total activities increase by 30% from the lowest level to the middle level. Total activities decrease by only 9% when the water level rises from medium to high. This is the smallest increase in total activities for the four lakes as the water level rises. The lake drops three feet from high to medium and another three feet from medium to low level.

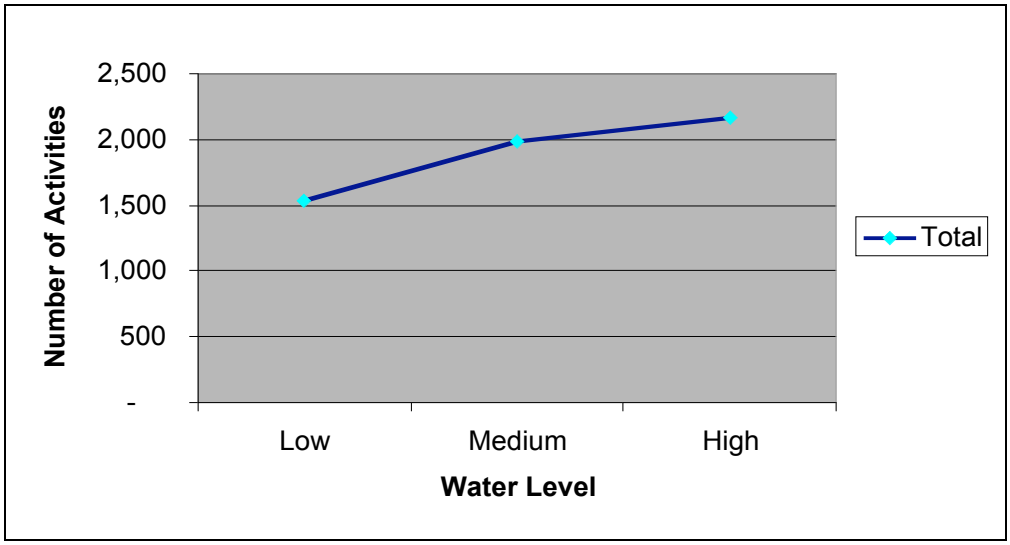

Figure 3.7. Total activities at Echo Lake with Low, Medium, and High water levels.

Table 3.18 shows the total number of activities chosen by telephone respondents for low, medium, and high water levels at Echo Lake. We obtained these numbers by asking respondents if they would engage in each of the 20 activities listed in Table 3.18 at low, medium, and high water levels as they viewed photos 7, 8, and 9. Table 3.18 shows the number who answered “yes” for each activity at each water level.

Five Most Frequent Activities

RES examined the five most frequently chosen activities at Echo Lake. We found that they are, in order of highest to lowest, hiking, picnicking, just relaxing, fishing, and swimming.

Table 3.18. Total activities for Echo Lake at Low, Medium and High water levels.

Activity	Low	Medium	High
Hiking	183	223	240
Picnicking	132	161	171
Just Relaxing	130	157	167
Fishing	104	149	166
Swimming	102	132	147
Wildlife Observation	111	136	145
Kayaking / Canoeing	101	131	142
Landscape Photography	104	130	141
Motor Boating	66	98	118
Sunbathing	82	106	111
Other Nature Study	77	94	102
Primitive Camping	77	95	100
Developed Camping	67	86	97
Other Boating	35	56	64
Bicycling	39	48	51
Running / Jogging	33	46	49
Horseback Riding	28	44	45
Tubing	23	36	39
Water Skiing	17	32	39
Off-road vehicles	20	28	29
Total Activities	1531	1988	2163

Figure 3.9 shows the five activities most frequently cited by the respondents for Echo Lake. As expected, the decline in activities is much sharper from medium to low than from high to medium.

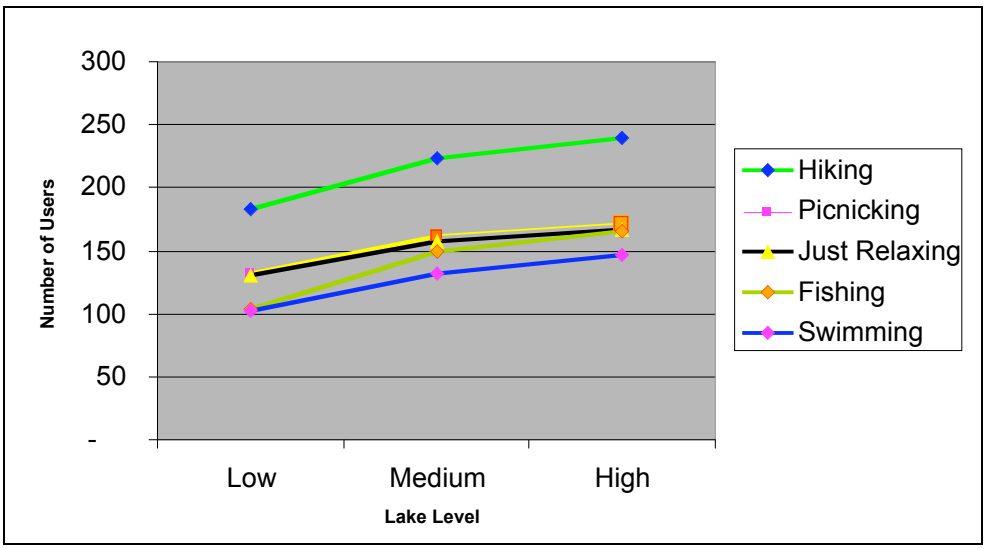

Figure 3.9. Five most frequent activities at Echo Lake with High, Medium, and Low water levels.

Aquatic and Land-Based Activities

We calculated aquatic measures by summing the types of activities that are associated with water-based recreation. The aquatic measures, which are the same as those used at Caples and Silver Lakes, consist of the following eight activities:

- Sunbathing
- Swimming
- Kayaking / Canoeing
- Other Boating
- Tubing
- Water Skiing
- Fishing
- Motor Boating

We also calculated a land-based activity scale that summed the “yes” responses to the following choices:

- Hiking
- Wildlife Observation
- Horseback Riding
- Other Nature Study
- Landscape Photography
- Picnicking
- Primitive Camping
- Developed Camping
- Running Jogging
- Just Relaxing
- Bicycling
- Off -road Vehicles

When we examine the summary data (Table 3.19) on the activities broken into aquatic activities and land-based activities, we find that, as the water level increases, there is an increase in the activities for both the aquatic and the land-based activities. However, the percent increase in water-based activities exceeds the percent increase in land-based activities as the water level rises.

Table 3.19. Change in activities and change in water level at Echo Lake.

Change in Photo Water Level	Change Water-based activities	Change Land-based activities
Low to Medium	41%	24%
Medium to High	11%	7%

Table 3.20 shows the changes in the average number of water-based activities mentioned per respondent at Echo Lake at low, medium, and high water levels. The names “Echo low” through “Echo high” represent the summation of all the choices representing the use of water for recreation. Notice that for water-based activities the mean number starts at 2.2 for the low level and increases to 2.9 for the high level.

Table 3.20. Average number of aquatic activities mentioned by respondent at Echo Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Echo High	284	2.908451	2.187032	0	8
Echo Medium	270	2.740741	2.170991	0	8
Echo High	239	2.217573	2.062761	0	8

Table 3.21 indicates that the land-based activities at Echo Lake do not increase as rapidly as they do at other lakes. The difference between activities at the low water level, photo 9, and the medium water level, photo 8, is four-tenths on average. A smaller increase in activities occurs between the medium water level and the high water level, photos 7 and 8 respectively. There is an increase of only one-tenth between these two levels.

Table 3.21. Average number of land-based activities mentioned by respondent at Echo Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Echo High	284	4.707746	3.468558	0	12
Echo Medium	270	4.622222	3.477739	0	12
Echo High	239	4.188285	3.443742	0	12

Overall Enjoyment for Activities

We asked respondents to evaluate the water level for the types of activities they normally do. They had the choices of “too low,” “about right” and “too high.” The fourth response was “it doesn’t matter to me.” Across all the combinations of lakes and levels, this response was not more than four. Table 3.22 shows the number of respondents who thought the water level was “about right” for the types of activities they normally do at Echo Lake at high, medium, and low water levels. There is a rather sharp drop in the number judging the water to be “about right” as the level drops. Note that the decline between photo 7 and photo 8 is not much different than the decline between photos 8 and 9 at Echo Lake.

Table 3.22. Overall enjoyment for types of activities at Echo Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 7 – highest level)	255	91.7	278
About right (Photo 8 – medium level)	193	70.4	274
About right (Photo 9 – lowest level)	59	48.8	121

Visual Enjoyment

We asked respondents if the water in the lake was about right, too high, or too low for their visual enjoyment. Figure 3.10 shows that the largest number of respondents, 270, or almost 97%, found the water level about right when viewing the photo 7 (high water level). The responses to "about right" decreased to 212 when the respondents examined photo 8 (medium water level). When the respondents were asked about their sense of visual enjoyment at the lowest water level (photo 9) we find that there is still a majority who feel it is about right, 74 (61.0%) but it is a smaller number of respondents (Table 3.23).

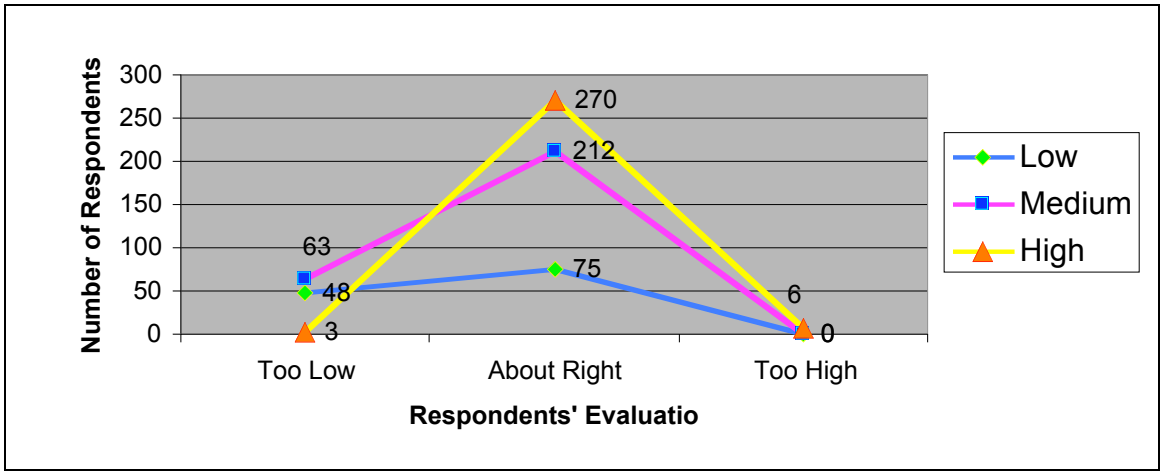

Figure 3.10. Evaluation of water level for visual enjoyment at Echo Lake using photos of High, Medium, and Low water levels.

Table 3.23. Evaluation of water levels at Echo Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 7 – highest level)	270	96.8	279
About right (Photo 8 – medium level)	212	77.1	275
About right (Photo 9 – lowest level)	74	61.0	123

What Would You Do?

When we asked respondents what they would do at the highest water level, an overwhelming number, 270, or almost 97%, indicated they would still go to Echo Lake. As the water level drops the number of persons who said they would still go to the lake drops somewhat. Table 3.24 shows that the percentage going to Echo Lake drops from 97% to 89% to 84% as the water level drops from high to medium to low. Most who would not go to Echo would go to another location.

We asked respondents what they would do if the water level were the same as in the photos 7, 8, and 9. Interviewers read the following choices: go to Echo Lake, go to another location, stay at home, or do something else. Note that 30 drop out when the water level decreases from high to medium and another 18 drop out when the lake drops from medium to low (Table 3.24). This is a decline of about 11% from high to medium and about 15% from medium to low.

What would you do if the water were at the level in the photo?											
Photo	Go to Echo		Go to Another Location		Stay at Home		Do Some-thing Else		Total	Number Who Will No Longer Go to Aloha	Percent Who Will No Longer Go to Aloha
A	B	C	D	E	F	G	H	I	J	K	L
Water Level	Survey	Col B/Col J	Survey	Col D / Col J	Survey	Col F / Col J	Survey	Col H / Col J	Col B + D + F + H	Col J - Col B	Col L / Col M
Low	105	85.4%	16	13.0%	2	1.6%	0	0.0%	123	18	14.6%
Medium	244	89.1%	26	9.5%	2	0.7%	2	0.7%	274	30	10.9%
High	270	96.8%	8	2.9%	0	0.0%	1	0.4%	279	9	3.2%

What would you do if the water were at the level in the photo?											
Photo	Go to Echo		Go to Another Location		Stay at Home		Do Some-thing Else		Total	Number Who Will No Longer Go to Aloha	Percent Who Will No Longer Go to Aloha
A	B	C	D	E	F	G	H	I	J	K	L
Water Level	Survey	Col B/Col J	Survey	Col D / Col J	Survey	Col F / Col J	Survey	Col H / Col J	Col B + D + F + H	Col J - Col B	Col L / Col M
Low	105	85.4%	16	13.0%	2	1.6%	0	0.0%	123	18	14.6%
Medium	244	89.1%	26	9.5%	2	0.7%	2	0.7%	274	30	10.9%
High	270	96.8%	8	2.9%	0	0.0%	1	0.4%	279	9	3.2%

Table 3.24. What would you do if the water were at the level in the photo? (Frequencies and percentages)

Water level	Go to Echo		Go to another location		Stay home		Do something else		Total	# who will no longer go to Echo	% who will no longer to go Echo
Survey	#	%	#	%	#	%	#	%	#	#	%
Low	105	85			2		0			18	14.6
Medium	244	8			2		2			30	10.9
High	27	9			0		1			9	3.2

We used the same procedures for presenting the information about Silver Lake as in the prior three lakes (Aloha, Caples, and Echo) in this report. Photos 10, 11, and 12 show the changes in the water level at this lake. These three photos show the lake at high, medium, and low lake levels in the brochure.

Activities

The respondents were directed to look at photos 10, 11, and 12 of Silver Lake. Photo 10 shows Silver at its highest level, and photo 12 shows it at its lowest level. Silver Lake drops 11 feet from high to medium, and it drops another 11 feet from medium to low. Our interviewers asked respondents if they engaged in any of the following 20 activities (this is the same list used for Caples and Echo lakes):

- Hiking
- Swimming
- Just Relaxing
- Picnicking
- Wildlife Observation
- Landscape Photography
- Primitive Camping
- Sunbathing
- Fishing
- Kayaking / Canoeing
- Other Nature Study
- Other Boating
- Running / Jogging
- Horseback Riding
- Tubing
- Motor Boating
- Developed Camping
- Bicycling
- Backpacking
- Driving Off-road Vehicles

If the respondent answered “yes,” the question for that activity is marked with a code of 1. Otherwise the code was 0.

Total Activities by Water Level

Table 3.25 shows that the average number of activities at the Silver Lake increases from 6.1 to 7.9 as the water level rises from low to high.

Table 3.25. Average number of activities mentioned per respondent at Silver Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Silver High	307	7.850163	5.023835	0	20
Silver Medium	302	7.006623	5.092496	0	20
Silver Low	167	6.107784	5.150775	0	20

Notice that the increase from low to medium levels in Figure 3.11 is much greater than the increase from medium to high levels. There is a 107% increase in activities from low to medium and a 14% increase from medium to high. The lake rises 11 feet from low to medium and another 11 feet from medium to high level.

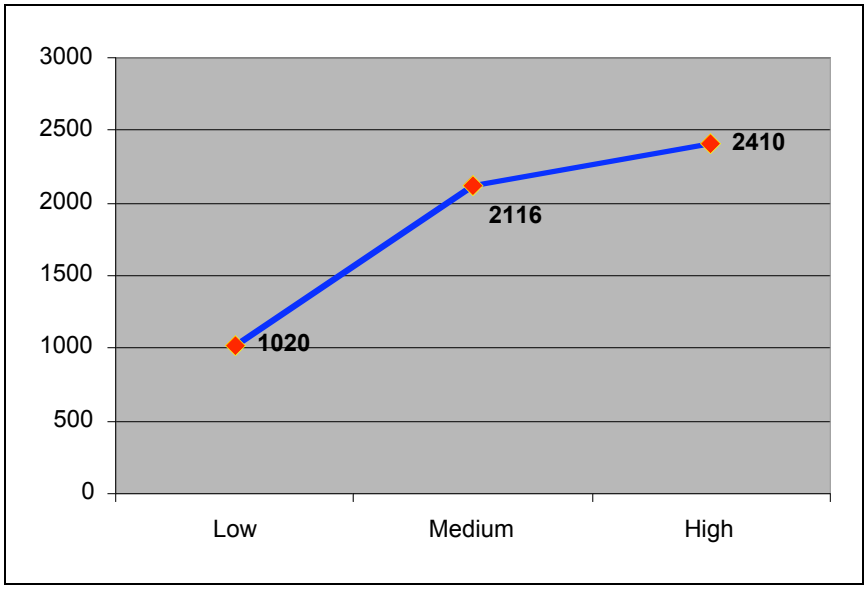

Figure 3.11. Total activities at Silver Lake with Low, Medium, and High water levels.

Table 3.26 shows the total number of activities chosen by telephone respondents for low, medium and high water levels at Silver Lake. We obtained these numbers by asking respondents if they would engage in each of the 20 activities listed in Table 3.26 at low, medium, and high water levels as they viewed the photos 10, 11, and 12. Table 3.26 shows the number who answered “yes” for each activity at each water level.

Five Most Frequent Activities

RES examined the five most frequently chosen activities at Silver Lake. They are, in order of highest to lowest, hiking, fishing, picnicking, just relaxing, and swimming (Figure 3.12).

Table 3.26. Total activities for Silver Lake at Low, Medium and High water levels.

Activity	Low	Medium	High
Hiking	108	232	250
Fishing	109	164	201
Picnicking	86	183	199
Just Relaxing	82	174	187
Swimming	76	158	181
Kayaking / Canoeing	57	136	159
Wildlife Observation	58	135	151
Landscape Photography	60	134	149
Developed Camping	64	118	134
Primitive Camping	58	108	124
Sunbathing	50	108	117
Other Nature Study	38	94	104
Motor Boating	36	70	94
Bicycling	33	64	68
Other Boating	20	47	62
Horseback Riding	26	51	59
Running / Jogging	15	43	47
Tubing	16	36	44
Water Skiing	10	28	42
Off-road vehicles	18	33	38
Total Activities	1020	2116	2410

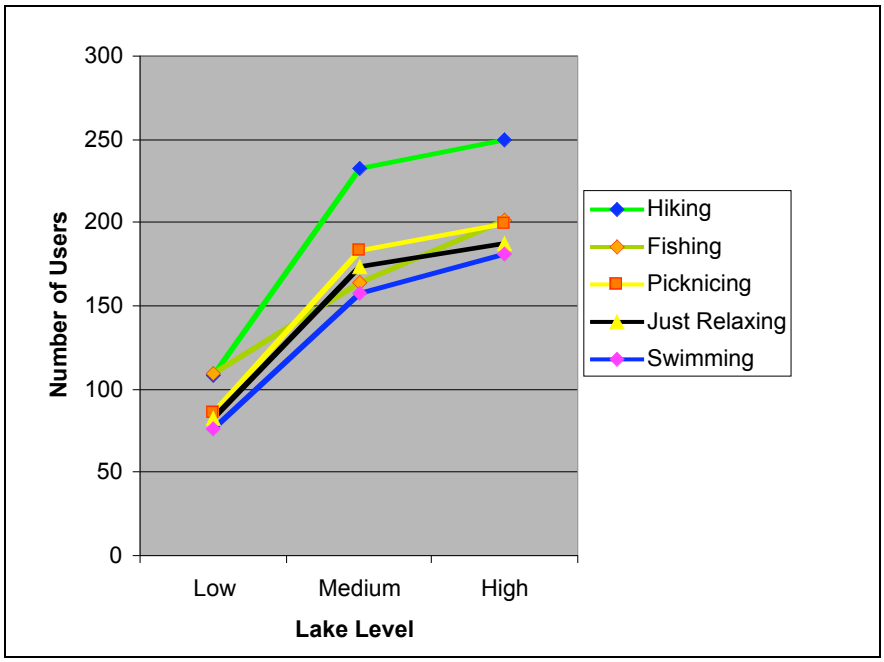

Figure 3.12. Five most frequent activities at Silver Lake with High, Medium, and Low water levels.

Aquatic and Land-Based Activities

We calculated summary measures of aquatic activities using the same measures used for Caples and Echo lakes. They consist of the following:

- Sunbathing
- Swimming
- Kayaking / Canoeing
- Other Boating
- Tubing
- Water Skiing
- Fishing
- Motor Boating

When we examine the summary data (Table 3.27) on the activities broken into aquatic activities and land-based activities, we find that, as the water level increases, there is an increase in the activities for both aquatic and land-based activities. Surprisingly, the percentage increase in land-based activities slightly exceeds the percentage increase in water-based activities when the water level rises from low to medium. This is the only case in which land-based activities increase faster than water-based activities when the water level rises.

Table 3.27. Change in activities and change in water level at Silver Lake.

Change in Photo Water Level	Change Water-based activities	Change Land-based activities
Low to Medium	105%	109%
Medium to High	18%	11%

Table 3.28 shows the pattern of water-based activities as the water levels drop at Silver Lake. Notice that the average number of chosen items for the highest level of the lake, labeled “Silver High” is 2.9, “Silver Medium” is 2.5, and “Silver Low” is 2.2. These averages represent photos 10, 11, and 12. This is a decline of 14% from the highest to the second highest water level, and 12% in the water level from photo 11 to 12. The lake rises 11 feet from low to medium and another 11 feet from medium to high level.

Table 3.28. Average number of aquatic activities mentioned by respondent at Silver Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Silver High	307	2.931596	2.043292	0	8
Silver Medium	302	2.47351	2.042154	0	8
Silver Low	167	2.239521	2.02755	0	8

Table 3.29 shows that the land-based activities at Silver Lake do not drop as precipitously as they do for Aloha and Caples lakes. The difference between activities at the high water level (photo 10) and the medium water level (photo 11) is 8.2% on average. A slightly more severe drop in activities occurs between the medium water level and the lowest water level (photos 11 and 12 respectively). There is a 13% drop in activities between these two water levels.

Table 3.29. Average number of land-based activities mentioned by respondent at Silver Lake.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Silver High	307	4.918567	3.386326	0	12
Silver Medium	302	4.533113	3.437708	0	12
Silver Low	167	3.868263	3.389479	0	12

Overall Enjoyment for Activities

We asked respondents to evaluate the water level for the types of activities they normally do. They had the choices of "too low," "about right" and "too high." The fourth response was "it doesn't matter to me." Across all the combinations of lakes and levels, this response was not more than four. Table 3.30 shows the number of respondents who thought the water level was "about right" for the types of activities they normally do at Silver Lake at high, medium, and low water levels. There is a rather sharp drop in the number of survey respondents who judged the water to be "about right" as the water level drops.

Table 3.30. Overall enjoyment for types of activities at Silver Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 10 – highest level)	291	94.8	307
About right (Photo 11 – medium level)	122	67.0	182
About right (Photo 12 – lowest level)	128	76.7	167

Visual Enjoyment

We asked respondents if the water in the lake was about right, too high, or too low for their visual enjoyment. Figure 3.13 shows that the largest number of respondents, 269, or almost 88%, found the water level about right when viewing the photo 10 (high water level). The responses to "about right" decreased to 105 when the respondents examined photo 11 (medium water level). Finally, at the lowest water level (photo 12), we find that the "about right group" is only 28 or 16.8% (Table 3.31).

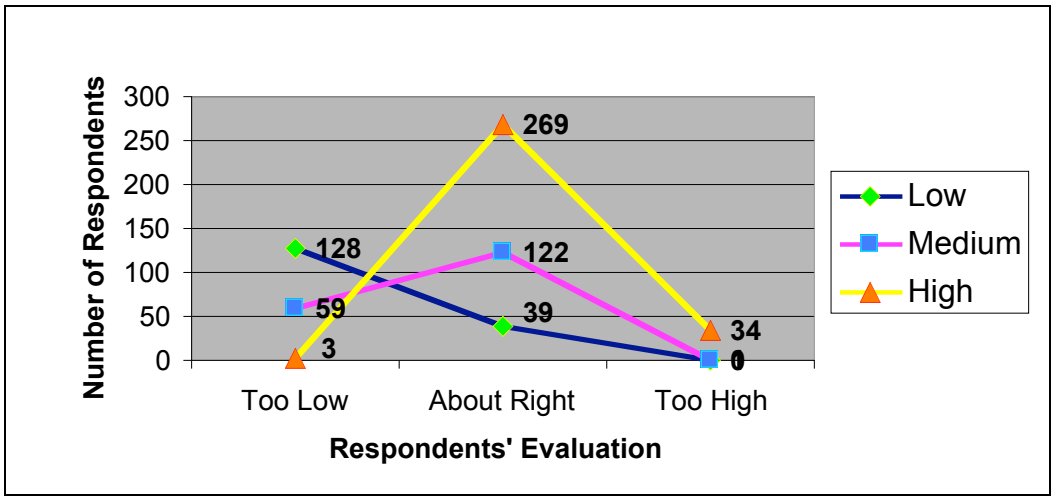

Figure 3.13. Evaluation of water level for visual enjoyment at Silver Lake using photos of High, Medium, and Low water Levels

Table 3.31. Evaluation of water levels at Silver Lake.

Response to water levels	Freq.	Percent	Total Respondents
About right (Photo 10 – highest level)	269	87.9	306
About right (Photo 11 – medium level)	105	58.1	181
About right (Photo 12 – lowest level)	28	16.8	166

We asked a question about how the respondent might feel about the water levels depicted at each lake at three different levels. The respondents had the choices of “too low,” “about right” and “too high.” The fourth response was “it doesn’t matter to me.” Across all the combinations of lakes and levels, this response was not more than four. Table 3.31 shows the combinations of water levels for the response “about right.”

What Would You Do?

We asked respondents what they would do if the water level were the same as in the photos 10, 11, and 12. Interviewers read the following choices: go to Silver Lake, go to another location, stay at home, or do something else (Table 3.32). Note that 16 drop out when the water level decreases from high to medium and another 62 drop out when the lake drops from medium to low This is a decline of about 9% from high to medium and about 37% from medium to low.

Table 3.32. What would you do if the water were at the level in the photo? (Frequencies and percentages)

Water level	Go to Silver		Go to another location		Stay home		Do something else		Total	# who will no longer go to Silver	% who will no longer to go Silver
Survey	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**#**	**%**
Low	104	62			14		0			62	37.3
Medium	167	9			0		4			16	8.7
High	30	9			0		1			5	1.6

SECTION 4 OVERALL CONCLUSIONS

Change in Total Activities

Total activities at all four lakes increase as the water level increases from low to medium to high water levels. However, the change in water levels has the least impact at Echo Lake, possibly because it experiences the lowest change in water level; it increases only six feet from low to high water level (Table 4.1).

Table 4.1. Change in activities and change in water level at Aloha, Caples, Echo, and Silver lakes.

	Aloha		Caples		Echo		Silver	
Change in Photo Water Level	**% Change Activities**	**Change in Water Level in Feet**	**% Change Activities**	**Change in Water Level in Feet**	**% Change Activities**	**Change in Water Level in Feet**	**% Change Activities**	**Change in Water Level in Feet**
High to Medium	14%	7.5	27%	28	8%	3	12%	11
Medium to Low	59%	7.5	49%	28	23%	3	52%	11

The change in water levels has the greatest impact for Aloha and Caples lakes. Although the absolute increase at Aloha is only 15 feet, it is a large relative increase that hides rocks and mud. Hikers who look at the low water level with the exposed rocks and mud may hike on to other lakes in the Desolation Wilderness Area. When the water level at Lake Aloha drops from high to medium, about 20% say they will go to another location in the Desolation Wilderness Area. When it drops from medium to low, almost one-third more say they will go to another location in the Desolation Wilderness Area. However, some hikers may see beauty at Lake Aloha when the water level is low since landscape photography shows up in the five most frequently mentioned activities only when the water level is low at Lake Aloha.

Caples Lake rises 56 feet from low to high water level. Since this is the largest absolute change, it is not surprising that the number of activities increases sharply with the rise in water level.

For all four lakes, the impact of a change in water level on activities is greater from low to medium than from medium to high

Aquatic vs. Land-Based Activities

When activities are divided into water-based and land-based, we find that both types of activities decline as water levels drops. For both types of activities, the rate of increase is greater from low to medium than from medium to high. However, the rate of increase for water-based activities is greater than the rate of increase for land-based activities (Table 4.2).

Table 4.2. Change in activities and water levels at Aloha, Caples, Echo, and Silver lakes.

	Aloha		Caples		Echo		Silver		All Lakes	
Change in Photo Water Level	% Change Water-Based Activities	% Change Land-Based Activities	% Change Water-Based Activities	% Change Land-Based Activities	% Change Water-Based Activities	% Change Land-Based Activities	% Change Water-Based Activities	% Change Land-Based Activities	% Change Water-Based Activities	% Change Land-Based Activities
Low to Medium	263%	125%	151%	114%	41%	24%	105%	109%	105%	81%
Medium to High	24%	14%	26%	16%	11%	7%	18%	11%	19%	12%

Five Most Frequently Mentioned Activities

Hiking is the most popular activity at each of the four lakes regardless of the water level with one exception. Fishing is the most popular activity at Silver Lake when the water is low.

At high water levels, hiking, picnicking, swimming, and just relaxing are the four most frequently mentioned at each of the lakes. Fishing is the fifth most frequently mentioned activity for all the lakes except Lake Aloha. At Lake Aloha, wildlife observation was the fifth most frequently mentioned activity.

At medium water level, the same six activities show up as they did for high water. In some cases the order changes. At low water level, the same six activities show up as they did for high water. A new activity, landscape photography, shows up for Lake Aloha. (Table 4.3)

Table 4.3. Five most frequently mentioned activities at the four lakes with high, medium, and low water levels.

5 Most Frequently Mentioned Activities at 4 Lakes with High Water							
Aloha		Caples		Echo		Silver	
Hiking	250	Hiking	244	Hiking	240	Hiking	250
Swimming	189	Fishing	210	Picnicking	171	Fishing	201
Just relaxing	186	Picnicking	186	Just Relaxing	167	Picnicking	199
Picnicking	185	Just Relaxing	172	Fishing	166	Just Relaxing	187
Wildlife Observation	162	Swimming	161	Swimming	147	Swimming	181
5 Most Frequently Mentioned Activities at 4 Lakes with Medium Water							
Aloha		Caples		Echo		Silver	
Hiking	228	Hiking	211	Hiking	223	Hiking	232
Just relaxing	169	Fishing	173	Picnicking	161	Fishing	164
Picnicking	164	Picnicking	162	Just Relaxing	157	Picnicking	183
Swimming	152	Just Relaxing	150	Fishing	149	Just Relaxing	174
Wildlife Observation	143	Wildlife Observation	135	Wildlife Observation	136	Swimming	158
5 Most Frequently Mentioned Activities at 4 Lakes with Low Water							
Aloha		Caples		Echo		Silver	
Hiking	105	Hiking	106	Hiking	183	Fishing	109
Just relaxing	73	Fishing	82	Picnicking	132	Hiking	108
Picnicking	69	Picnicking	76	Just Relaxing	130	Picnicking	86
Wildlife Observation	66	Just Relaxing	75	Wildlife Observation	111	Just Relaxing	82
Landscape Photography	57	Wildlife Observation	65	Fishing	104	Swimming	76