

Visitor Use at Glen Canyon National Recreation Area, Comparison of Personal Watercraft Users and Nonusers



Final Report
Fall 1999 Data Collection
submitted to:
Glen Canyon National Recreation Area

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Definitions

Group	Individuals traveling together.
Group Log	Brief form filled out by the interviewer to collect information about the group.
Mail-Back Survey	Survey sent to a sample of individual members of each group contacted during the onsite interviewing process.
Mean	A measure of the center of the data set. Popularly known as the arithmetic <i>average</i> ; the sum of the observations in the set divided by the number of observations. Means have a leveling effect. They tell nothing about variations or extreme values that may act to skew the data.
Median	The number in the data set where one-half of the numbers are at or below it and one-half above it. It is often a better statistic than the mean when the population is skewed by extreme values. Indicators of a population skewed by extreme values include a high standard deviation or a large difference between the mean and median.
N (Number)	Number of respondents. The total N may vary from table to table because not all visitors that responded to the onsite or mail-back surveys answered every question.
Non Personal Watercraft Operators	Respondents who reported that they did not operate a personal watercraft. A subgroup in this report compared to personal watercraft operators (see definition of personal watercraft operator).
Onsite Survey	Visitors were contacted onsite at several locations in Glen Canyon. The interviewer completed the group log and visitors were asked to fill out a short survey about their trip. Respondents had the opportunity to indicate whether they were willing or unwilling to fill out a mail-back questionnaire about their experiences at the lakeshore.
Percent	Percentage; proportion of, or ratio.

Personal Watercraft (PWC)	Small, highly maneuverable watercraft usually capable of holding one or two riders and using an inboard motor to run a water jet pump for propulsion.
Personal Watercraft Operator	Respondents who indicated that they used a personal watercraft. A subgroup in this report compared to other respondents (see definition of non personal watercraft operator).
Respondents	Individual visitors who completed and returned a mail-back survey.
Significantly Different	Subgroups of the total sample (e.g., personal watercraft operators versus other respondents) were tested for statistically significant differences using t-tests. Only significant differences at the .05 level were reported.
Significance Level Significant at the .05 Level (i.e., $p \leq 0.5$)	Probability of a Type-I error (rejecting null hypothesis when it's true). Throughout this report, a .05 significance level was used as criteria for testing null hypothesis that subgroup means of the total sample are equal. A .05 significance level assumes that we are correctly accepting a null hypothesis 95 percent of the time and risk rejecting it only 5 percent of the time. That is, there is a 95 percent probability that two subgroups really differ, or less than a 5 percent probability that the apparent difference is due to chance.
Total Sample	Total number of respondents (Total N).
Zones	Visitor use areas at Glen Canyon National Recreation Area dividing the total area into 13 geographic parts.

Executive Summary

During the fall of 1999, the Cooperative Park Studies Program (CPSP) at the University of Minnesota conducted the first phase of a three-part project to gather information about visitors to Glen Canyon National Recreation Area (NRA). The study sought to provide information to managers about visitors' perceptions of Glen Canyon NRA, including information about (a) conflicts between personal watercraft (PWC) and non PWC operators, (b) experiences and benefits from using the area, (c) management in the area, and (d) satisfaction with their trips. This study provides the information needed by managers at Glen Canyon NRA to institute specific strategies and actions to address potential visitor conflicts and related issues.

Data about fall users at Glen Canyon NRA were gathered through the use of an onsite survey, group log, and mail-back questionnaire. Initial visitor contacts were made at the time of the onsite survey and group log, which was administered at selected points at the Wahweap, Bullfrog, Halls, and Hite locations at Glen Canyon NRA. Individuals indicating an interest in participating in the study were sent a mail-back questionnaire. A total of 615 visitors completed the onsite survey, of which 323 were randomly selected to be mailed a questionnaire. Of the 323 questionnaires that were mailed, 72 percent were returned.

Respondents (individuals who returned a mail-back questionnaire), and nonrespondents (individuals who did not return a mail-back questionnaire) were evaluated using selected variables from the onsite survey to determine nonresponse bias. Overall, respondents and nonrespondents were more similar than different. There were two statistically significant differences. Males were more likely return the mail-back questionnaire. Of visitors who returned the mail-back questionnaire, 73 percent were male and 27 percent were female. Of those who did not return the questionnaire 60 percent were male and 40 percent were female. Also, respondents were older than nonrespondents. The mean age of respondents was 48.8 compared to the mean age of nonrespondents, 43.4.

Visitor data were analyzed for all mail-back questionnaires completed and returned by selected visitors. Questionnaires were sent to individuals who were willing to fill out a questionnaire about their experience at Glen Canyon NRA. Two user groups, *personal watercraft (PWC) operators* and *non PWC operators*, were evaluated to determine whether statistically significant differences existed between them. Understanding the potentially different characteristics, motives, perceptions, and opinions of PWC operators and non PWC operators can help managers develop effective methods to reduce potential visitor conflicts at Glen Canyon NRA. PWC operators were identified as respondents who indicated that they had operated a PWC. Non PWC operators were identified as respondents who indicated they had not operated a PWC.

PWC operators made up 37 percent of the fall sample. They were an average of 48.2 years old. Seventy-three percent of PWC operators were male. They were mostly from Utah, Colorado, and Arizona, with only four other states represented. Thirty-one percent had completed college, and 25 percent were in the process of or had received an

advanced degree. Eighty-one percent had incomes of \$40,000 or more. Groups of PWC operators tended to be slightly larger than groups of non PWC operators. Groups of PWC operators had a mean size of 6.6 individuals. Most PWC operators were repeat visitors to Glen Canyon NRA. The mean number of nights groups spent in the area was 5.0. The most common activities PWC operators reported participating in were motor boating, camping at shoreline campsites, fishing, swimming, and hiking Lake Powell side canyons.

Many PWC operators were associated with houseboat use. Slightly more than one-third reported using a houseboat as their primary vessel. The most popular areas for PWC operators to visit were the zones that include Rainbow Bridge, Wahweap, Bullfrog and Halls marinas, Defiance House Ruin, Warm Creek, and Escalante. Visiting Glen Canyon NRA was the primary purpose behind most PWC operators visit to the area. The top ranked experiences PWC operators wanted during their visit were to enjoy the scenery of Lake Powell, to get away from the usual demands of life, to do something with their family, to experience nature, to relax physically, to use their own equipment, and to be with people who enjoy the same things they do.

Non PWC operators made up the majority, 63 percent, of the fall sample. The average age of non PWC operators was 49.4. There were more males, 71 percent, than females, 29 percent. Most non PWC operators were from Utah, Arizona, or Colorado with a small percentage of visitors representing 10 other states. Twenty-eight percent had graduated from college, and 18 percent were in the process of or had completed an advanced degree. Seventy-five percent had incomes of more than \$40,000. Groups of non PWC operators tended to be slightly smaller than PWC operators. Groups of non PWC operators had a mean size of 4.6 individuals. Most non PWC operators were repeat visitors to Glen Canyon NRA. The mean number of nights groups spent in the area was 4.1. The most common activities non PWC operators reported participating in were motor boating, fishing, camping at shoreline sites, hiking Lake Powell side canyons, and visiting archaeological sites.

Over half of non PWC operators used a powerboat as their primary vessel. The most popular areas for them to visit on Lake Powell were the zones that that include Wahweap, Rainbow Bridge, Warm Creek , Bullfrog and Halls marinas, and Padre Bay. Visiting Glen Canyon NRA was the primary purpose behind most non PWC operators visit to the area. The top ranked experiences non PWC operators wanted during their visit were to enjoy the scenery of Lake Powell, to get away from the usual demands of life, to experience nature, to experience natural quiet, and to do something with their family.

Overall, Glen Canyon was the primary purpose for most respondents' visit to the area. A majority in both comparison groups stated that visiting Glen Canyon NRA was "the primary purpose of my visit to the area". Most respondents were repeat visitors to Glen Canyon NRA. Eighty-nine percent of respondents stated that they had visited Glen Canyon previously. Only 11 percent stated that this was their first visit to Glen Canyon NRA. The mean number of visits for PWC operators was 46.9 and the mean for non PWC operators was 53.2 The median number of visits was 13 for PWC operators and 5

for non PWC operators. The median is a more accurate measure of the number of visits visitors made to Glen Canyon NRA than the mean due to outliers, a small number of individuals who reported having made a large number of visits to the area. The majority of respondents stated that they spent between one and three nights in the area. The median number of nights spent in the area by PWC operators was 3. The median number of nights spent in the area by non PWC operators was also 3. Lake Powell and in campgrounds were the two most popular place to spend nights. Over half of all respondents stated that they spent nights on Lake Powell. Seventeen percent of respondents stated that they spent nights in a campground.

Family and friends were the most common group type of respondents. Most groups contacted in Glen Canyon NRA had between two and four people. Groups with PWCs tended to be slightly larger than groups without PWCs. About one-fifth of groups brought pets with them.

Almost three quarters of respondents were male. Both PWC and non PWC operators had similar gender distributions. Non PWC operators tended to be slightly older than PWC operators.

Half of all respondents had finished college. Compared to non PWC operators, more PWC operators had completed college and completed or are pursuing post graduate education. More than three quarters of all respondents had incomes of at least \$40,000. Almost all respondents, 98 percent, reported that they are white.

Respondents represent 16 different states, however most come from Utah, Arizona, and Colorado.

Activity participation was varied, however the focus was on water and camping activities. Overall, the most popular activities at Glen Canyon NRA were motor boating, fishing, camping at shoreline campsites, using a PWC, and hiking Lake Powell side canyons.

The most prevalent primary watercraft type was a powerboat. Slightly more than half of all groups had powerboats with them. Slightly more than one-quarter of groups had a houseboat with them.

Thirty-seven percent of respondents reported operating a PWC. Of those, 42 percent reported having taken a class on PWC operation and safety. Slightly less than half of PWC operators reported using a gas dock to refuel. Slightly more than half of PWC operators reported using a support vessel for human waste disposal, slightly less than one-third reported using the floating toilets provided on Lake Powell, and 17 percent reported using a portable toilet.

Zone 1, the location of Wahweap marina, received the highest level of use overall and by non PWC operators. Zone 6, the location of Rainbow Bridge received the highest level of use by PWC operators. Zone 6, the location of Rainbow Bridge received the second highest level of overall use. Zone 3, the location of Warm Creek, received the third

highest level of overall use. PWC operators second highest use areas were zone 11, the location of Bullfrog and Halls marinas, and zone 1, the Wahweap area.

An understanding of visitors' motives for visiting a recreation resource is important to helping managers provide opportunities for visitors to attain the experiences they desire. The majority of visitors were interested in enjoying the scenery of Lake Powell, getting away from the usual demands of life, experiencing nature, doing something with their family, experiencing natural quiet, and relaxing physically.

Natural areas provide a myriad of opportunities for visitors to gain psychological and physiological benefits. The positive impact of both onsite and offsite benefits are an important consideration when developing management plans that effectively serve visitors, surrounding communities, and the environment. In order to evaluate visitor benefits, visitors were asked to what level they were able to achieve desired experiences. For the most part, respondents reported being able to achieve desired experiences. The only exceptions were participating in ranger-led activities with an overall rating of "did not" to "somewhat" attained, learning about the natural history of the area and learning about the cultural history of the area with an overall rating of "somewhat" to "moderately" attained. There was one significant differences in experience attainment found between PWC operators and non PWC operators, that of being close to nature. PWC operators were more able than non PWC operators to attain that experience.

Problems visitors experience during their visits can diminish the quality of their experiences and hinder the attainment of benefits they may otherwise have gained. To assess the existence of potential problems at Glen Canyon NRA, respondents evaluated 27 possible situations they may have experienced on their most recent trip to Glen Canyon NRA. Overall, study participants encountered few problems during their visit. Situations rated as most problematic were litter on beaches and shoreline, unsafe operation of PWCs, people being inconsiderate, too many PWCs on the lake, boats closer to their boat than they like, finding beach campsites, and finding an unoccupied campsite. At least one quarter or more of respondents rated these situations as a moderate to very serious problem. Three significant differences were found between PWC operators and non PWC operators. Non PWC operators were more likely than PWC operators to find unsafe operation of PWCs, too many PWCs on the lake, and conflicts with PWC operators problematic. Visitors were also asked whether or not they observed unsafe boating practices during their visit, and whether or not they felt safe. One quarter of respondents reported observing unsafe behavior, however only 3 percent of respondents reported not feeling safe during their visit to Glen Canyon. The responses of PWC and non PWC operators were similar, although slightly more non PWC operators reported observing unsafe behavior and not feeling safe.

It is important to recognize that different types of visitors may have different perceptions of crowding and that their perceptions are often based on the types of experiences they seek. As recreational use of natural areas increases, crowding has the potential to impede the attainment of visitors' desired experiences, particularly for visitors seeking solitude. Perceptions of feeling crowded can lead to changes in visitor behavior and use patterns.

For example, visitors may choose to recreate at a site during seasons when use is not as intense. For some visitors, crowding may interfere with their recreational goals to the point where they select alternative sites to pursue their desired experiences. Displacement becomes problematic when suitable substitutes are difficult to find, or are simply unavailable. To determine sites of potential crowding at Glen Canyon NRA, study participants were asked to evaluate the acceptability of their encounters at five locations within the area. Using a 7-point scale (1=very unacceptable, 7=very acceptable), respondents rated the acceptability of encounters with people or watercraft for each location they had visited. The majority of respondents, 75 percent or more in all locations, indicated that the listed locations (on the lake surface, on the lake shore, at fueling docks, at boat landings, while at campsite) had acceptable numbers of watercraft. There were no significant differences between PWC operators and non PWC operators regarding the acceptability of watercraft numbers.

How Glen Canyon chooses to manage for PWC use will influence visitor experiences for years to come. An understanding of visitors' management preferences can aid the development of a management strategy that protects the resource and provides quality recreational opportunities. Respondents' level of support or opposition for specific actions at Glen Canyon NRA was determined by examining their responses to 25 possible management actions. The management actions supported or strongly supported by at least two-thirds of total sample were: to aggressively enforce safety rules and regulations on lake, provide more information to visitors about appropriate behavior, provide visitors with natural history information about the area, and use management controls to prevent damage to the environment by visitors. Half or more of the total sample opposed or strongly opposed prohibiting motorized watercraft on the lake, prohibiting non-motorized watercraft on the lake, limiting the number of non-motorized watercraft allowed on the lake at any one time, prohibiting PWCs on the lake, limiting the number of people per group allowed on the lake, restricting the number of people using the lake at any one time, prohibiting drinking alcoholic beverages on the lake, limiting the number of motorized watercraft allowed on the lake at any one time, limiting the number of boats allowed on the lake, limiting the number of houseboats allowed on the lake at any one time, and zoning the waters to provide specific uses at specific places. Significant differences were found between PWC operators and non PWC operators for one potential management action. PWC operators were more likely to oppose prohibiting PWCs on the lake than were non PWC operators.

Visitor feedback regarding satisfaction with their experiences is important to evaluating how well visitors perceive their needs are being met. Additionally, this information can help determine visitors' satisfaction with their visits and how well they were able to attain their desired experiences and receive the associated benefits. Respondents had the opportunity to express their satisfaction with the quality of ten different services provided at Glen Canyon NRA. Overall, visitors were satisfied with the quality of services at Glen Canyon NRA. When asked about their overall experience, the majority stated that they were satisfied.

Study participants also were asked to evaluate a list of 12 statements about their most recent trip to Glen Canyon NRA and to indicate the extent to which they agreed or

disagreed with each statement. Visitors enjoyed their visit to Glen Canyon NRA. The majority of respondents, over 90 percent, agreed or strongly agreed with the statements I enjoyed my time on Lake Powell, overall, I was satisfied with my most recent trip to Glen Crayon, and I enjoyed the natural quiet. There was one significant difference found between PWC operators and other visitors. Non PWC operators were more likely to agree with the statement the presence of PWCs interfered with the quality of my boating experience, than were PWC operators.

To understand what these study results mean for managers, that is, how they relate to conflict over the use of PWCs and possible management actions that might address this issue at Glen Canyon NRA, it is important to understand what components go into creating conflict. Four components have been identified as possible sources of conflict. They are differences in activity style, resource specificity, mode of experience, and lifestyle tolerance (Jacob and Schreyer 1980). Levels of potential conflict can be assessed by looking for differences between PWC operators and non PWC operators in these four categories.

PWC and non PWC operators had some differences in their activity style, although these differences might not cause conflict between the groups. Some activities, however, such as fishing and PWC use, may come into conflict if both types of users are trying to pursue different activities in the same physical place. PWC operators were more likely to engage in swimming and water sports than were non PWC operators. Non PWC operators were more likely to bird watch than were PWC operators.

Resource specificity refers to the level of value a visitor holds for a specific resource, in this case Lake Powell. Value can be assessed by examining visitors' motives for visiting the area and the number of visits they had made to Glen Canyon NRA in the past. A high percentage of both PWC operators and non PWC operators reported that visiting Glen Canyon NRA was the primary purpose of their visit. Both groups also had a large percentage of individuals who were repeat visitors to the area. Also, both groups stayed a similar length of time. This indicates that both groups place a high value on Glen Canyon as a recreational resource.

Mode of experience can be assessed by desired experiences of Glen Canyon NRA visitors. There were no significant differences between PWC operators and non PWC operators in terms of the experiences that they desired.

Lifestyle tolerance is more difficult to determine. However, data on safety, crowding, visitor support of management actions, and verbatim comments can be used to ascertain visitors' sensitivity to other resource users. Both PWC and non PWC operators had similar observation levels of unsafe operation of watercraft and feelings of safety, and neither were at such a level as to indicate a very serious problem. The fact that one quarter of respondents did observe unsafe operation of watercraft might, however, be indicative that some type of management action to address this problem would be warranted. Crowding was not an issue for either group, and there was only one significant difference between the groups in terms of their support for various management actions.

Unsurprisingly, PWC operators were less likely to support prohibiting PWC use than were non PWC operators, although neither group showed strong support for this option.

Differences between the groups were very small and it appears there is not much conflict occurring between PWC operators and non PWC operators at Glen Canyon NRA during the fall use period. There is, however, some evidence of possible conflict between PWC operators and non PWC operators in the area. Management actions to address potential conflict could be utilized to protect high quality experiences and the attainment of desired benefits, particularly with the expectation that use levels in the area will continue to rise. Generally acceptable management actions that address conflict include aggressively enforcing safety rules and regulations, providing more information to visitors about appropriate behavior, providing visitors with natural history information about the area, and using management controls to prevent damage to the environment by visitors. The most opposed measures by both groups include prohibiting motorized watercraft on the lake and prohibiting non-motorized watercraft on the lake.

Background

Glen Canyon National Recreation Area (NRA) is located in northern Arizona and southern Utah along the Colorado River. The centerpiece of the recreation area is Lake Powell, a 186-mile long reservoir created when the Colorado River was dammed near Page, Arizona. The Glen Canyon Dam creates hydroelectric power and stores water as part of the Colorado River Compact, an agreement on the division of the water in the Colorado River among the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. The dam itself is a major attraction of Glen Canyon NRA. Lake Powell has over 1,800 miles of shoreline because of the numerous side canyons off the main canyon. A variety of recreational opportunities exist on and around the lake. For example, kayaking, riding a tour boat, power boating, sailing, using personal watercraft, water skiing, and fishing are among the many water sports visitors enjoy. Opportunities also exist for hiking in the surrounding canyon areas. Visitors can enjoy a range of camping opportunities from remote and undeveloped campsites to fully developed campgrounds. Finally, visitors to the area can see archeological and culturally significant sites such as Rainbow Bridge, a site of spiritual importance for American Indians, and the tallest natural bridge in the United States.

During the fall of 1999, the Cooperative Park Studies Program (CPSP) at the University of Minnesota administered the first of three onsite surveys to Glen Canyon NRA visitors. The onsite survey was distributed by trained CPSP interviewers between October 18, 1999 and November 14, 1999. The onsite survey collected basic demographic information from visitors and allowed them the opportunity to indicate whether or not they were willing to fill out a mail-back questionnaire. The mail-back questionnaire was sent to randomly selected visitors who had indicated that they were willing to participate in the study. The questionnaire was sent after visitors had completed their trip to the Glen Canyon area. The survey instrument and data analysis represent a cooperative effort between the National Park Service (NPS), the University of Minnesota's CPSP, and the staff at Glen Canyon NRA.

Purpose of the Study

Data collected from this visitor study will provide useful information to management about their visitors and will provide input that will help managers plan for and manage personal watercraft use in Glen Canyon NRA. The study looks at all visitors using the resource, as well as looking specifically at the population of visitors who operated and those who did not operate personal watercraft during their visit to the area.

The NPS prohibits the use of personal watercraft unless it is deemed appropriate for a specific park based on: (a) the enabling legislation of the park, (b) the park's resources and values, (c) other visitor uses, and (d) the overall management objectives of the park. The complete final rule for personal watercraft management in National Park units can be found in volume 55 of the 2000 Federal Register. Results from this visitor use study can help Glen Canyon NRA managers determine whether personal watercraft use is appropriate for the area.

Topics addressed by this study include:

1. The characteristics of respondents' visits (e.g., length of stay, group type and size, activities at Glen Canyon NRA, watercraft use).
2. Who the visitors are in terms of their socio-economic background (e.g., age, gender, education, income, ethnicity and race, residence, past experience at Glen Canyon NRA).
3. The types of watercraft people are using during their visit and information about personal watercraft operators.
4. Why people visit Glen Canyon NRA and what benefits they seek.
5. What problems visitors experience at Glen Canyon NRA.
6. Opinions visitors have concerning the management of Glen Canyon NRA.
7. How satisfied visitors are with their visit to Glen Canyon NRA.

Study Methods

The population of interest was individuals visiting Glen Canyon NRA between October 18, 1999 and November 14, 1999. The survey instrument and methods used by the Cooperative Park Studies Program interviewer closely followed Dillman's Total Design Method (2000). This methodology has been shown to increase response rates, improve accuracy, and reduce costs and burden hours.

The study was conducted in two parts. In the first part, a short onsite visitor survey (Appendix A) and group log (Appendix B) were completed onsite at Glen Canyon NRA. The onsite survey was filled out by visitors and collected basic information such as the number of times visitors had been to Glen Canyon NRA, where visitors spent nights at Glen Canyon NRA, visitors' purpose for visiting Glen Canyon NRA, visitors' gender and age, and whether or not they would be willing to fill out a mail-back survey after their trip. The group log was filled out by the interviewer and collected information about the group type, the zones in Glen Canyon NRA where the group spent the majority of their time, the number of people in the group, the type of group, the type and number of watercraft used during the group's trip, and the number and types of pets traveling with the group. In the second part a longer, more in depth survey (Appendix C) was mailed to a randomly selected sample of visitors who had indicated a willingness to participate in the mail-back survey on the onsite survey. This questionnaire collected information such as activities visitors participated in while at Glen Canyon NRA, the importance of experiences to visitors and how well they were able to attain them, information about visitors' use of watercraft, situations visitors experienced at Glen Canyon NRA, visitors' support of selected management actions, visitors' satisfaction with services offered at Glen Canyon NRA, their feelings about their trip to Glen Canyon NRA, and demographic information.

Distribution of the onsite survey and group log occurred from October 18, 1999 through November 14, 1999. To obtain responses from all 13 zones (Appendix D) of Glen Canyon NRA (Fig.1, page 5), the CPSP interviewer sampled at four locations within Glen Canyon NRA—Wahweap, Bullfrog, Halls, and Hite marinas. A CPSP interviewer sampled several sites at each of the four locations including boat launches, picnic areas, marinas, boat rental areas, and campgrounds. Interview locations were selected so that use data collected would be representative of the entire area. Surveys were distributed at these locations throughout the week, including both weekends and weekdays. Visitors were contacted during randomly chosen morning, afternoon, and evening time periods. This strategy was important to selecting a representative sample of visitors.

To begin an interview, the interviewer approached the first visitor spotted during the sampling period. The visitor was asked to participate. If they said "yes," they were given the onsite survey to complete. After they completed the onsite survey, the interviewer filled out the group log for their group. If they said "no," the interviewer thanked them for their time and approached the next visitor.

Two weeks after the initial contact, the visitor was mailed a cover letter (Appendix F) explaining the study along with the mail-back questionnaire and a postage paid return envelope. Follow-up procedures with non-respondents were used to obtain a high response rate. A reminder letter was sent along with a second questionnaire and postage paid return envelope two weeks after the original mailing. A second reminder letter along with a third questionnaire and postage paid return envelope was sent to each non-respondent two weeks after the first reminder.

The CPSP collected 615 onsite surveys during the fall sampling period. Of the 323 randomly selected visitors sent the mail-back questionnaire, 234 returned it for a response rate of 72 percent. This response rate is large enough for statistically valid data analysis.

The completed survey forms were keypunched professionally and the data set was uploaded to a personal computer for analysis. Data were analyzed using the Statistical Program for the Social Sciences (SPSS/PC+). Basic descriptive statistics, frequency distributions, and selected cross tabulations were computed for selected variables.

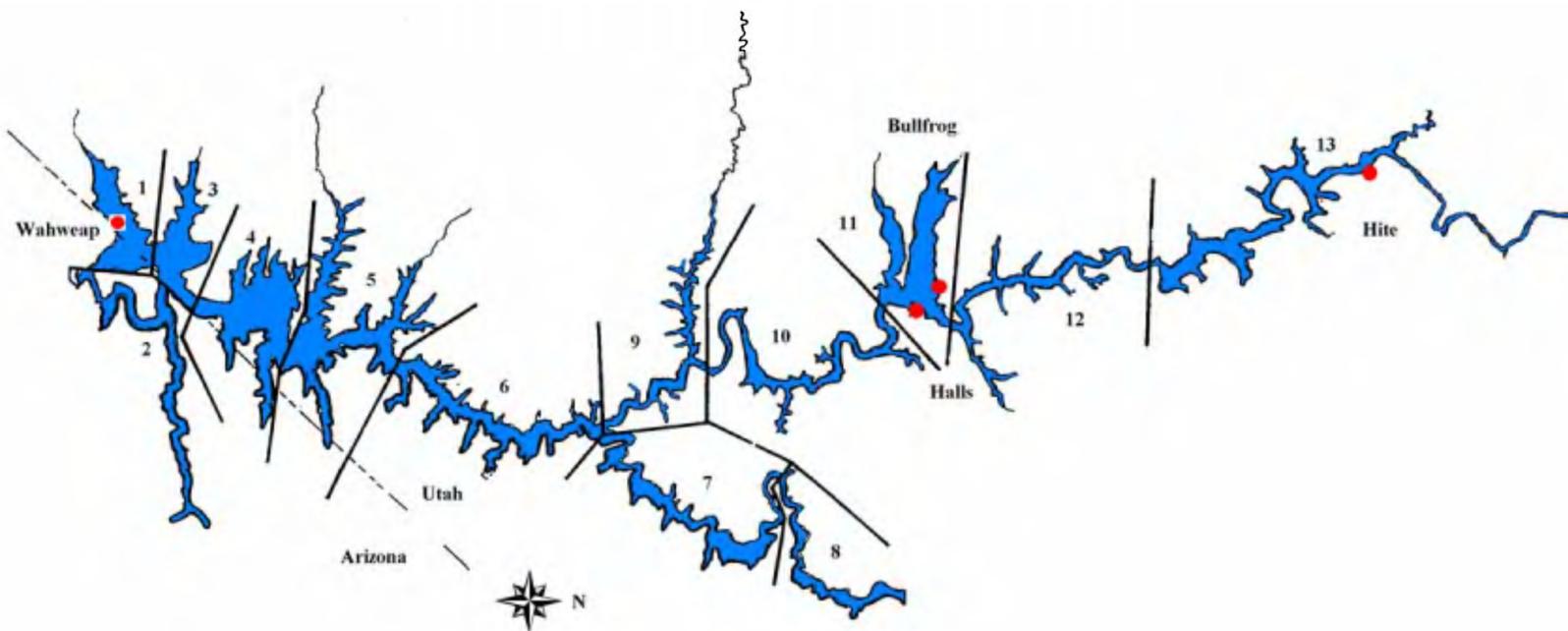
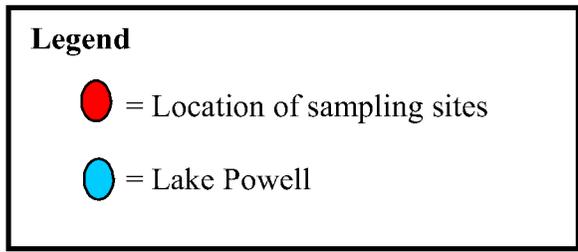


Figure 1. Sampling locations at Glen Canyon National Recreation Area.



Selected Study Results

This section describes: (a) visitors filling out the mail-back visitor survey, (b) respondents' visit to Glen Canyon, (c) watercraft use at Glen Canyon NRA, (d) characteristics of visitors to Glen Canyon NRA, (e) visitors motives for visiting Glen Canyon NRA, (f) benefits visitors received by visiting Glen Canyon NRA, (g) problems visitors experienced during their visit, (h) crowding conditions at specific locations within Glen Canyon NRA, (i) perceptions of management actions to address problems, and (j) services provided and visitors' overall experiences at Glen Canyon NRA. Tables referenced to in this section can be found directly after descriptive text.

A. Comparisons of Respondents and Nonrespondents

Selected variables from the onsite survey were examined to determine whether statistically significant differences exist between *respondents*, those individuals who returned a mail-back questionnaire, and *nonrespondents*, those individuals who did not. There were very few significant differences found between these two groups. No significant differences were found between the two groups in the number of previous visits to Glen Canyon NRA, the number of nights they spent at Glen Canyon NRA, where they spent nights during their visit to Glen Canyon NRA, respondents' plan for visiting Glen Canyon NRA (whether it was the primary purpose of their visit, one of several important things they planned to do during their visit to the area, or something they decided to do after arriving in the area), or in their state of residence (Table A.1, Table A.2, Table A.3, Table A.4, and Table A.7).

There was a significant difference in the gender make-up of those who returned the mail-back questionnaire and those who did not. Of visitors who returned the mail-back questionnaire, 73 percent were male and 27 percent were female. Of those who did not return the questionnaire 60 percent were male and 40 percent were female (Table A.5).

There was also a significant difference in the mean age of visitors who returned the mail-back questionnaire and those who did not. Visitors who returned the mail-back questionnaire had a mean age of 48.8. Visitors who did not return the mail-back questionnaire had a mean age of 43.4 (Table A.6).

Because the responses from visitors who did and did not return the mail-back questionnaire are similar in almost all areas, and the response rate for the study season was relatively high (72 percent) we can assume that the results from the fall season are representative of fall visitors to Glen Canyon NRA.

Table A.1. Number of previous visits to Glen Canyon NRA, by visitors who *did* and who *did not* return the mail-back questionnaire.

Number of previous visits	Returned Questionnaire		Did not return Questionnaire	
	N	Percent	N	Percent
First Visit	25	11	12	15
2-5 previous visits	48	20	22	28
6-10 previous visits	28	12	12	15
11-20 previous visits	37	16	7	9
21-30 previous visits	16	7	3	4
31-50 previous visits	29	13	9	11
50 or more previous visits	49	21	14	18
Total	232	100	79	100

Source: Onsite survey, Question 1.

Returned Questionnaire:	Mean number of visits: 73.3	Median number of visits: 15
Did not return Questionnaire:	Mean number of visits: 68.8	Median number of visits: 8

Table A.2. Nights spent in Glen Canyon NRA area on this trip, by visitors who *did* and who *did not* return the mail-back questionnaire.

Number of nights	Returned questionnaire		Did not return questionnaire	
	N	Percent	N	Percent
1	23	11	8	12
2	58	27	18	27
3	48	23	11	16
4	18	9	12	18
5	26	12	3	5
6	9	4	3	5
7	11	5	6	9
8	2	1	3	5
9	1	1	2	3
10	4	2	--	--
11	3	1	1	2
12	1	1	--	--
13	--	--	--	--
14	1	1	--	--
15 or more	8	4	--	--
Total	213	102*	67	102*

Source: Onsite survey, Question 2.

Returned questionnaire:	Mean number of nights: 4.4	Median number of nights: 3
Did not return questionnaire:	Mean number of nights: 3.8	Median number of nights: 3

*Percent does not add to 100 percent due to rounding error.

Table A.3. Where visitors spent their nights while in Glen Canyon area on this trip, by visitors who *did* and who *did not* return the mail-back questionnaire.

Where visitors spent nights	Returned questionnaire			Did not return questionnaire		
	N	Percent*	Percent**	N	Percent*	Percent**
On Lake Powell	130	53	58	42	48	55
In a campground	39	16	17	11	13	14
In an area Hotel/Motel	34	14	15	10	12	13
Other	29	12	13	13	15	17
Did not spend night	11	5	5	10	12	13
At Home	1	<1	<1	1	1	1
Total	244	100	108	87	101***	113

Source: Onsite survey, Question 2.

*Based on number of *responses*

**Based on number of *respondents* (returned questionnaire N=234; did not return questionnaire N=83); study participants could give more than one response.

***Percent does not add to 100 percent due to rounding error.

Table A.4. Respondents' plan for visiting Glen Canyon NRA, by visitors who *did* and who *did not* return the mail-back questionnaire.

Plan for visiting Glen Canyon NRA	Returned questionnaire		Did not return questionnaire	
	N	Percent	N	Percent
The primary purpose of my visit to the area	210	92	74	91
One of several important things I planned to do during my visit to the area	16	7	6	7
Something I decided to do <u>after</u> arriving in the area	2	1	1	1
Total	228	100	81	99*

Source: Onsite survey, Question 3

* Percent does not add to 100 percent due to rounding error.

Table A.5. Gender of respondents, by visitors who *did* and who *did not* return the mail-back questionnaire.

Gender	Returned questionnaire		Did not return questionnaire	
	N	Percent	N	Percent
Male	171	73	50	60
Female	62	27	33	40
Total	233	100	83	100

Source: Onsite survey, Question 5.

□ Significant difference, $p \leq .05$.

Table A.6. Age of respondents, by visitors who *did* and who *did not* return the mail-back questionnaire.

Respondent age	Returned questionnaire		Did not return questionnaire	
	N	Percent	N	Percent
16-19	2	1	2	3
20-24	9	4	2	3
25-29	12	5	14	17
30-34	11	5	8	10
35-39	16	7	5	6
40-44	31	13	10	12
45-49	46	20	12	15
50-54	33	14	11	14
55-59	24	10	6	7
60-64	15	6	6	7
65-69	20	9	4	5
70 or older	14	6	1	1
Total	233	100	81	100

Source: Onsite survey, Question 5.

Returned questionnaire*:	Mean age: 48.8	Median age: 49
Did not return questionnaire*:	Mean age: 43.4	Median age: 44

* Significant difference, $p \leq .05$.

Table A.7. Permanent residence of respondents, by visitors who *did* and who *did not* return the mail-back questionnaire.

State of residence	Returned questionnaire		Did not return questionnaire	
	N	Percent	N	Percent
Utah	90	39	27	33
Arizona	65	28	25	30
Colorado	52	23	15	18
California	7	3	8	10
Nevada	3	1	1	1
Oregon	2	1	2	2
Washington	2	1	--	--
Michigan	2	1	--	--
New Mexico	1	<1	3	4
Oklahoma	1	<1	--	--
Alaska	1	<1	--	--
Wyoming	1	<1	1	1
Iowa	1	<1	--	--
Maryland	1	<1	--	--
Illinois	1	<1	--	--
Minnesota	1	<1	--	--
Nebraska	--	--	1	1
Total	231	100	83	100

Source: Onsite survey.

B. Trip Characteristics

In this section, and in all the following sections, overall statistics for all respondents are given as well as statistics comparing PWC operators to all non PWC operators.

Visitor data were analyzed for all mail-back questionnaires completed and returned. Two user groups, *personal watercraft operators* and *non personal watercraft operators*, were evaluated to determine whether statistically significant differences existed between these subgroups. Understanding the potentially different characteristics, motives, perceptions, and opinions of PWC and non PWC operators can help managers develop an effective plan to reduce visitor conflicts at Glen Canyon NRA and aid in long-range planning.

Most respondents were repeat visitors to Glen Canyon NRA. Twenty percent of respondents stated that they had visited Glen Canyon previously between 2 and 5 times (Table B.1) and 69 percent had visited more than five times. Eleven percent stated that this was their first visit to Glen Canyon NRA.

We also compared the sub-groups of PWC operators and non PWC operators visiting Glen Canyon NRA. First time visitors made up 9 percent of the PWC operators and 12 percent of the non PWC operators. Nineteen percent of PWC operators stated that they had visited Glen Canyon NRA previously between two and five times and 22 percent of non PWC operators stated that they had visited Glen Canyon NRA previously between two and five times. The mean visit number of PWC operators is 46.9 and the median visit number is 13. The mean visit number of non PWC operators is 53.2 and the median visit number is 5. The high mean visit numbers can be explained by outliers, a few respondents stating that they had visited Glen Canyon a very large number of times.

The majority of respondents, 61 percent, stated that they spent between one and three nights in the area (Table B.2). The mean number of nights spent in the area was 4.4 and the median number of nights was 3. The mean number of nights spent in the area by PWC operators was 5.0 and the median number of nights spent in the area by PWC operators was 3. The mean number of nights spent in the area by non PWC operators was 4.1 and the median number of nights spent in the area by non PWC operators was 3.

Lake Powell was the most popular place to spend nights. The majority of respondents, 58 percent, stated that they spent nights on Lake Powell (Table B.3). Both the majority of PWC operators, 59 percent, and non PWC operators, 57 percent, stated that they spent nights on Lake Powell.

Glen Canyon was the primary purpose for most respondents' visit to the area. The majority of respondents, 92 percent, stated that visiting Glen Canyon NRA was "the primary purpose of my visit to the area" (Table B.4). Both the majority of PWC operators and non PWC operators, 92 percent in each group, indicated that visiting Glen Canyon NRA was "the primary purpose of my visit to the area."

Family and friends were the most common group type of respondents. The majority of groups, 91 percent, stated that they were in a group made up of family and friends (Table B.5). Both the majority of groups traveling with personal watercraft, 97 percent, and groups that did not have personal watercraft, 90 percent, stated that they were in a group made up of family and friends.

Most groups (60 percent) contacted in Glen Canyon NRA had between two and four people, with the mean number of people being 4.9 and the median number of people being three (Table B.6). PWC groups tended to be larger than non PWC groups. PWC groups had a mean of 6.6 people and a median of six people. Non PWC groups had a mean of 4.6 people and a median of three people.

The majority of groups did not bring pets. Twenty-one percent of the groups reported that their group brought dogs along, and less than one percent of the groups brought cats or other pets (Table B.7). Of the groups with personal watercraft, 22 percent brought dogs. Of non PWC groups, 21 percent brought dogs on their visit to Glen Canyon NRA.

Activity participation was varied, however the focus was on water and camping activities. Overall, the most popular activities at Glen Canyon NRA were motor boating, fishing, and camping at shoreline campsites with at least half of the total sample participating in these activities (Table B.8). Other popular activities were using a personal watercraft, hiking Lake Powell side canyons, swimming, visiting archaeological sites, and participating in water sports with at least a quarter of total sample participating in these activities. Five percent of non PWC operators reported using a personal watercraft, indicating that they may have viewed themselves as passengers and not as PWC operators (PWC operators were identified by question 6a on the mail-back survey, "did you operate a personal watercraft").

PWC operators reported swimming as an activity, 51 percent, as compared to 28 percent of non PWC operators. PWC operators reported participating in water sports as an activity, 34 percent, compared to 19 percent of non PWC operators. Another difference was found in participation in bird watching. Few PWC operators reported bird watching as an activity, 8 percent, compared to 22 percent of non PWC operators. Other activities listed by respondents can be found in Appendix G. Some examples include SCUBA diving, relaxing, and astronomy.

Table B.1. Number of previous visits to Glen Canyon National Recreation Area.

Number of previous visits	Total Sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
First Time	25	11	7	9	18	12
2-5 previous visits	47	20	15	19	32	22
6-10 previous visits	28	12	13	16	15	10
11-20 previous visits	37	16	15	19	22	15
21-30 previous visits	15	7	6	7	9	6
31-50 previous visits	29	13	9	11	19	13
Over 50 previous visits	49	21	16	20	33	22
Total	230	100	81	101*	148	100

Source: Onsite survey, Question 1.

Total sample:	Mean number of visits: 50.7	Median number of visits: 5
PWC operators:	Mean number of visits: 46.9	Median number of visits: 13
Non PWC operators:	Mean number of visits: 53.2	Median number of visits: 5

*Percent does not add to 100 percent due to rounding error.

Table B.2. Nights spent in Glen Canyon area on this trip.

Number of nights	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
1	23	11	7	9	16	12
2	58	27	21	27	37	27
3	48	23	18	23	30	22
4	18	9	7	9	10	7
5	26	12	3	4	23	17
6	9	4	6	8	3	2
7	11	5	6	8	5	4
8	2	1	--	--	2	2
9	1	<1	1	1	--	--
10	4	2	2	3	2	2
11	3	1	--	--	3	2
12	1	<1	1	1	--	--
13	--	--	--	--	--	--
14	1	<1	1	1	--	--
15 or more	8	4	4	5	4	2
Total	213	100	77	99*	135	99*

Source: Onsite survey, Question 2.

All respondents:	Mean number of nights: 4.4	Median number of nights: 3
PWC operators:	Mean number of nights: 5.0	Median number of nights: 3
Non PWC operators:	Mean number of nights: 4.1	Median number of nights: 3

*Percent does not add to 100 percent due to rounding error.

Table B.3. Where visitors spent their nights while in Glen Canyon area on this trip.

Where visitors spent nights	Total sample			PWC operators			Non PWC operators		
	N	Percent*	Percent**	N	Percent*	Percent**	N	Percent*	Percent**
On Lake Powell	130	53	58	46	54	59	83	53	57
In a campground	39	16	17	13	15	17	26	17	18
In an area Hotel/Motel	34	14	15	14	16	18	20	13	14
Other	29	12	13	12	14	15	17	11	12
Did not spend night	11	5	5	1	1	1	10	6	7
At Home	1	<1	<1	--	--	--	1	1	1
Total	244	100	--	86	99***	--	157	101***	--

Source: Onsite survey, Question 2.

*Based on number of *responses*

**Based on number of *respondents* (Total sample N=224; PWC operators N=78; Non PWC operators N=145); study participants could give more than one response.

***Percent does not add to 100 percent due to rounding error.

Table B.4. Respondents' plan for visiting Glen Canyon NRA.

Plan for visiting Glen Canyon NRA	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
The primary purpose of my visit to the area	210	92	73	92	136	92
One of several important things I planned to do during my visit to the area	16	7	6	8	10	7
Something I decided to do <u>after</u> arriving in the area	2	1	--	--	2	1
Total	228	100	79	100	148	100

Source: Onsite survey, Question 3.

*Percent does not add to 100 percent due to rounding error.

Table B.5. Group type of Glen Canyon NRA visitors.

Group Type	All groups		PWC groups		Non PWC groups	
	N	Percent	N	Percent	N	Percent
Family and friends	322	91	56	97	266	90
Alone	22	6	1	2	21	7
Tour	4	1	--	--	4	1
Business	2	1	--	--	2	1
Other	5	1	1	2	4	1
Total	355	100	58	101*	297	100

Source: Group log.

*Percent does not add to 100 percent due to rounding error.

Table B.6. Group size of Glen Canyon NRA visitors.

Number of people	All groups		PWC groups		Non PWC groups	
	N	Percent	N	Percent	N	Percent
1	22	6	1	2	21	7
2	123	35	12	21	111	37
3	38	11	5	9	33	11
4	48	14	3	5	45	15
5	29	8	4	7	25	8
6-10	62	17	21	36	41	14
11-15	23	6	12	21	11	4
16 or more	10	3	--	--	10	3
Total	355	100	58	101*	297	99*

Source: Group Log.

All groups:	Mean number of people: 4.9	Median number of people: 3
PWC groups:	Mean number of people: 6.6	Median number of people: 6
Non PWC groups:	Mean number of people: 4.6	Median number of people: 3

*Percent does not add to 100 percent due to rounding error.

Table B.7. Pets brought to Glen Canyon NRA by groups.

Type of pet	All groups		PWC groups		Non PWC groups	
	N	Percent	N	Percent	N	Percent
None	276	78	45	78	231	78
Dog	75	21	13	22	62	21
Cat	3	<1	--	--	3	1
Other	1	<1	--	--	1	<1
Total	355	100	58	100	297	101*

Source: Group Log.

* Percent does not add to 100 percent due to rounding error.

Table B.8. Activities respondents participated in while at Glen Canyon NRA.

Activity	Total sample			PWC operators			Non PWC operators		
	N	Percent*	Percent**	N	Percent*	Percent**	N	Percent*	Percent***
Motor boating	177	16	76	64	14	77	112	17	75
Fishing	131	12	56	43	10	52	88	13	59
Camping at shoreline campsites	118	11	50	44	10	53	73	11	49
Using a personal watercraft	90	8	39	81	18	100	8	1	5
Hiking Lake Powell side canyons	87	8	37	31	7	37	56	9	37
Swimming	84	8	36	42	9	51	42	6	28
Visiting archaeological sites	65	6	28	21	5	25	43	7	29
Participating in water sports	58	5	25	28	6	34	29	4	19
Wildlife watching	48	4	21	13	3	16	35	5	23
Camping at developed campsites (main marina locations)	44	4	19	18	4	22	26	4	17
Bird watching	40	4	17	7	2	8	33	5	22
Hiking in front-country	38	3	16	10	2	12	28	4	19
Camping at primitive sites in the back-country	30	3	13	6	1	7	24	4	16
Paddling (canoe or kayak)	16	1	7	6	1	7	10	2	7
Hiking in back-country	16	1	7	4	1	5	12	2	8
Driving (Burr Trail, Hole in the Rock Road)	11	1	5	4	1	5	7	1	5
Sailing	7	1	3	2	1	2	5	1	3
Tour boat ride	6	1	3	2	1	2	4	1	3
Hunting	2	<1	1	--	--	--	2	<1	1
Mountain biking	2	<1	1	2	1	2	--	--	--
Other****	32	3	14	12	3	15	20	3	13
Total	1052	101***	--	440	100	--	657	101***	--

Source: Mail-back survey, Question 1.

*Based on number of *responses*

**Based on number of *respondents* (Total sample N=234; PWC operators N=83; Non PWC operators N= 150); study participants could give more than one response.

***Percent does not add to 100 percent due to rounding error.

****Responses in other category are found in Appendix G.

☐ Differences between groups are statistically significant at the p<0.05 level.

C. Watercraft Use at Glen Canyon National Recreation Area

Visitors were asked about the primary type of watercraft they used during their visit to Glen Canyon NRA, ownership of the primary watercraft, different types of watercraft they used during their visit, and whether or not they had taken a class in PWC operation and safety. If respondents indicated that they operated a PWC they were also asked about refueling methods, human waste and human waste disposal. Finally visitor groups were asked to identify which zones they frequented while on Lake Powell. This information is important to managers because it indicates the nature of watercraft use on Lake Powell and addresses overall use by zone occurring on Lake Powell. With this information managers can fine tune management actions to best fit the needs of visitors to Glen Canyon NRA.

The majority of respondents, 57 percent, stated that the primary watercraft they used during their visit to Glen Canyon NRA was a powerboat (Table C.1). Thirty-eight percent of PWC operators stated that a houseboat was their primary watercraft compared to 20 percent of non PWC operators. Thirty-seven percent of PWC operators stated that a powerboat was their primary watercraft compared to 68 percent of non PWC operators. Twenty-two percent of PWC operators stated that personal watercraft were their primary watercraft compared to one percent of non PWC operators. This one percent may be explained by confusion in a small number of respondents over the definition of personal watercraft and whether or not it includes multiple types of personally owned vessels.

Most respondents used their own watercraft. The majority of respondents, 77 percent (Table C.2), reported that they owned the primary watercraft that they used during their visit to Glen Canyon NRA. Slightly over six percent stated that they rented the primary watercraft that they used during their visit to Glen Canyon NRA. There were no significant differences between PWC operators and non PWC operators in terms of primary watercraft ownership.

Overall, of the groups visiting Glen Canyon who used watercraft, 78 percent (Table C.3), had powerboats with them, 36 percent had houseboats with them, and 16 percent had personal watercraft. Sixty-seven percent of groups with personal watercraft had houseboats compared to 30 percent of non PWC groups. Most groups only had one of any given type of watercraft with the exception of personal watercraft and kayaks, which averaged two per group that had this type of watercraft with them. There are no significant differences between groups that brought personal watercraft and non PWC groups in terms of the number of watercraft by type each group brought with them.

Only around a third of houseboats on Lake Powell brought personal watercraft on their trips. Of all groups traveling on Lake Powell with houseboats, 30 percent had PWCs with them (Table C.4). Of all groups traveling on Lake Powell with powerboats, only 15 percent had PWCs with them (Table C.5).

The majority of respondents, 70 percent (Table C.6), had not taken a class in personal watercraft safety and use. Forty-two percent of PWC operators stated that they had taken

a class in personal watercraft safety and use compared to 23 percent of non PWC operators.

Thirty-seven percent of respondents stated that they operated a personal watercraft during their visit to Glen Canyon NRA (Table C.7). Of those, 78 percent stated that they used their own personal watercraft and only six percent stated that they rented a personal watercraft (Table C.8). Rentals were from one of the area towns as opposed to from the concessionaire, Aramark (Table C.9).

Forty-eight percent of PWC operators used the gas dock to refuel (Table C.10). Only 7 percent used a gas can on the water to refuel their personal watercraft.

More than half (53 percent) of PWC operators stated that they used a marine toilet aboard a support vessel (Table C.11). Only 17 percent stated that they carried a portable toilet, and eight percent stated that they used "other" methods of waste disposal, such as burying waste above the high water mark.

Table C.1. Primary watercraft used by Glen Canyon National Recreation Area visitors.

Type of vessel	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Powerboat	128	57	30	37	96	68
Houseboat	59	26	31	38	28	20
Personal Watercraft	20	9	18	22	2	1
Canoe	5	2	1	1	4	3
Kayak	4	2	--	--	4	3
Sailboat	1	<1	--	--	1	1
Other*	9	4	2	2	7	5
Total	226	100	82	100	142	101**

Source: Mail-back survey, Question 3.

* Responses in the other category include: tour boat, 12 foot fishing boat, and pontoon with full enclosure.

** Percent does not add to 100 percent due to rounding error.

■ Differences between groups are statistically significant at the p<0.05 level.

Table C.2. Ownership of primary watercraft used by Glen Canyon NRA respondents.

Ownership	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Owned by respondent	173	77	66	81	107	75
Co-own/ Multiple owner	21	9	12	15	9	6
Rent houseboat from concessionaire	9	4	1	1	--	--
Rent powerboat from concessionaire	4	2	--	--	9	6
Rent from local company in town	1	<1	--	--	4	3
Other*	16	7	3	4	13	9
Total	224	99**	82	101**	142	99**

Source: Mail-back Questionnaire, Question 4.

*Responses in the other category include: time share and friend's boat.

**Percent does not add to 100 percent due to rounding error.

Table C.3. Overall watercraft use by boat type by Glen Canyon NRA groups.

Vessel type	All groups				PWC groups				Non PWC groups			
	N	Mean*	Percent**	Percent***	N	Mean*	Percent**	Percent***	N	Mean*	Percent**	Percent***
Powerboat	277	1.3	50	78	42	1.3	28	72	235	1.3	58	79
Houseboat	128	1.1	23	36	39	1.0	26	67	89	1.1	22	30
Personal Watercraft	58	1.9	10	16	58	1.9	38	100	--	--	--	--
Inflatable toys	23	1.6	4	7	9	1.8	6	16	14	1.5	4	5
Kayak	14	2.0	3	4	1	2.0	1	2	13	2.0	3	4
Raft (motor)	10	1.0	2	3	1	1.0	1	2	9	1.0	2	3
Raft (no motor)	5	1.0	1	1	1	1.0	1	2	4	1.0	1	1
Sailboat	5	1.0	1	1	--	--	--	--	5	1.0	1	2
Canoe	4	1.0	1	1	--	--	--	--	4	1.0	1	1
Other	32	1.0	6	9	1	1.0	1	2	31	1.0	8	10
Total	556	--	101****	--	162	--	102****	--	404	--	100	--

Source: Group Log.

*Indicates mean number of watercraft by type per group.

**Based on number of *watercraft*

***Based on number of *group with watercraft* (Total sample N=355; PWC groups N=58; Non PWC groups N= 297); groups could have more than one watercraft.

****Percent does not add to 100 percent due to rounding error.

Table C.4. Houseboaters traveling with PWCs

Houseboaters with PWCs	N	Percent
Had PWC	39	30
Did not have PWC	89	70
Total	128	100

Source: Group Log.

Table C.5. Powerboaters traveling with PWCs

Powerboaters with PWCs	N	Percent
Had PWC	42	15
Did not have PWC	235	85
Total	277	100

Source: Group Log.

Table C.6. Glen Canyon NRA visitors' participation in personal watercraft safety/instruction class.

Taken class	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
No	156	70	48	58	108	77
Yes	67	30	35	42	32	23
Total	223	100	83	100	140	100

Source: Mail-back survey, Question 5.

Differences between groups are statistically significant at the $p < 0.05$ level.

Table C.7. Glen Canyon NRA visitors operation of personal watercraft, by Total sample.

Operated personal watercraft	Total sample	
	N	Percent
No	143	63
Yes	83	37
Total	226	100

Source: Mail-back survey, Question 6a.

Table C.8. Ownership of personal watercraft by personal watercraft operators on Lake Powell, by *personal watercraft operators*.

Personal watercraft ownership	PWC operators	
	N	Percent
Your own personal watercraft	65	78
A friend's personal watercraft	13	16
A rental personal watercraft	5	6
Total	83	100

Source: Mail-back survey, Question 6b.

Table C.9. Where personal watercraft operators on Lake Powell rented personal watercraft, by *personal watercraft operators*.

Personal watercraft rental	PWC operators	
	N	Percent
From town	5	100
From concessionaire	--	--
Total	5	100

Source: Mail-back survey, Question 6b.

Table C.10. Personal watercraft refueling method used by personal watercraft operators on Lake Powell, by *personal watercraft operators*.

Refueling method	PWC operators		
	N	Percent*	Percent**
Gas dock	39	27	48
Purchased fuel in the area	36	25	44
Brought own fuel from home	19	13	23
Gas station	19	13	23
Gas can on shore	15	11	18
Did not refuel personal watercraft	9	6	11
Gas can on the water	6	4	7
Total	143	99***	--

Source: Mail-back survey, Question 6c.

*Based on number of *responses*

**Based on number of *respondents* (PWC operators N=82); study participants could give more than one response.

***Percent does not add to 100 percent due to rounding error.

Table C.11. Human waste disposal by personal watercraft operators on Lake Powell, by *personal watercraft operators*.

Waste disposal method	PWC operators		
	N	Percent*	Percent**
Use a marine toilet aboard a support vessel	44	35	53
Use facilities provided at landings	36	29	43
Use floating restrooms provided on Lake Powell	25	20	30
Carry a portable toilet***	14	11	17
Other method of waste disposal****	7	6	8
Total	126	101*****	--

Source: Mail-back survey, Question 6d.

*Based on number of *responses*

**Based on number of *respondents* (PWC operators N=83); study participants could give more than one response.

***Portable toilets include such things as sealing coffee cans and PVC piping.

**** Other methods include: Burying waste above high water mark.

*****Percent does not add to 100 percent due to rounding error.

Most groups spent the majority of their time in one or more of four zones (Table C.12) Twenty-two percent of groups primarily visited zone 1 (Wahweap area), 20 percent visited zone 6 (Rainbow Bridge area), 19 percent visited zone 3 (Warm Creek area), and 17 percent visited zone 11 (Bullfrog and Halls Marina area). Figure 2 (page 28) illustrates the level of primary zone use of all groups on Lake Powell during the fall sampling period.

The four zones where groups with *personal watercraft* spent most of their time were zone 6 (Rainbow Bridge area) with 23 percent of groups, zone 1 (Wahweap area) with 21 percent of groups, zone 11 (Bullfrog and Halls Marina area) with 21 percent of groups, and zone 12 (Defiance House Ruin area), with 14 percent of groups primarily using this area (Figure 3, page 28).

The four zones where non PWC groups spent most of their time were zone 1 (Wahweap area) with 23 percent of groups, zone 6 (Rainbow Bridge area) with 20 percent of groups, zone 3 (Warm Creek area) with 20 percent of groups, and zone 11 (Bullfrog and Halls Marinas area) with 16 percent of groups primarily in this area (Figure 4, page 28). Where differences exist between groups with personal watercraft and non PWC groups, these differences may be attributed to proximity to marinas. Groups using only personal watercraft may be unlikely to travel far from developed areas, possibly because of restrictions on how many supplies they can bring with them.

Table C.12. Lake Powell zones where Glen Canyon NRA groups spent the majority of their time.

Zone	All Groups			PWC groups watercraft*			Non PWC groups		
	N	Percent*	Percent**	N	Percent*	Percent**	N	Percent*	Percent**
1	79	16	22	12	17	21	67	15	23
2	33	7	9	3	4	5	30	7	10
3	65	13	19	5	7	9	60	14	20
4	41	8	12	4	6	7	37	9	13
5	29	6	8	3	4	5	26	6	9
6	71	14	20	13	18	23	58	13	20
7	6	1	2	2	3	4	4	1	1
8	6	1	2	--	--	--	6	1	2
9	24	5	7	5	7	9	19	4	6
10	20	4	6	2	3	4	18	4	6
11	58	11	17	12	17	21	46	11	16
12	38	8	11	8	11	14	30	7	10
13	38	8	11	2	3	4	36	8	12
Total	508	102***	--	71	100	--	437	100	--

Source: Group Log.

*Based on number of *responses*

**Based on number of *respondents* (All groups N=352, PWC groups N=57; Non PWC groups N=295); study participants could give more than one response.

***Percent does not add to 100 percent due to rounding error.

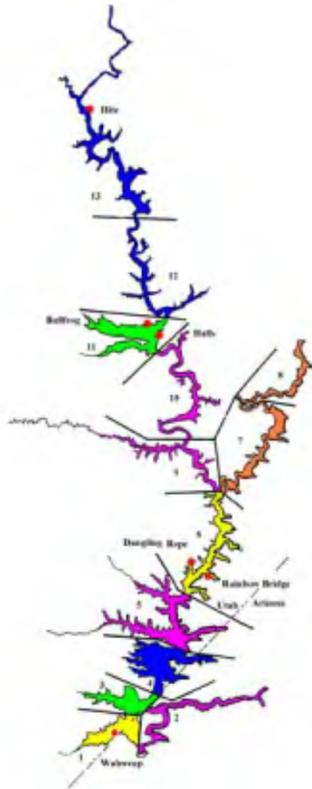


Figure 2. Use by all groups

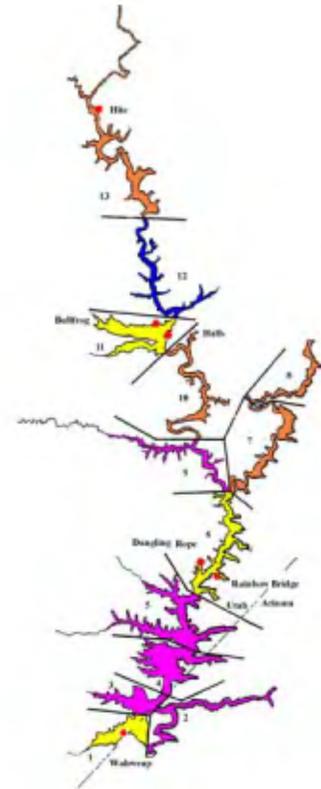


Figure 3. Use by PWCs

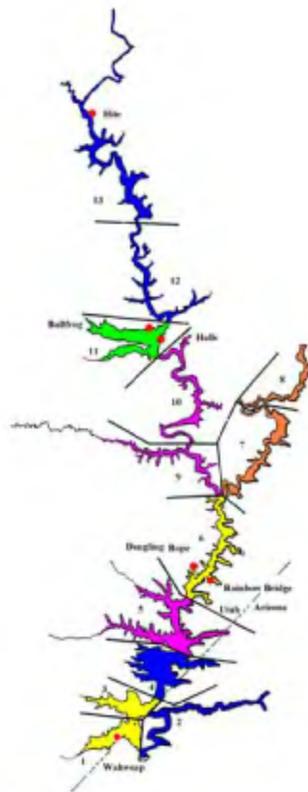
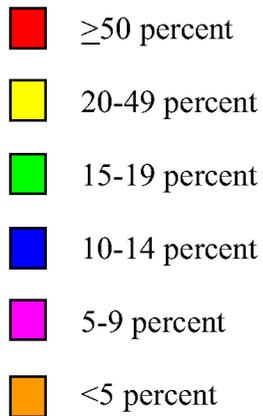


Figure 4. Use by Non PWCs



D. Visitor Characteristics

Demographic data were evaluated to determine potential differences between user groups. Of the total sample, 72 percent were male and 28 percent were female (Table D.1). Gender for both PWC operators and non PWC operators were very similar to the total respondent gender breakdown. Seventy-three percent of PWC operators were male and 27 percent were female. Seventy-one percent of non PWC operators were male and 29 percent were female.

The mean age for visitors is 49.0 years old (Table D.2). There is very little difference in the mean ages of PWC operators, 48.2 years old, and non PWC operators, 49.4 years old.

In the onsite survey, respondents were asked to submit the ZIP Code of their mailing address. The ZIP Code was used to group respondents by state. Seventeen states are represented and all but Maryland are western or mid-western states (Table D.3). Most respondents, 89 percent, were from Utah, Arizona, and Colorado. Utah had 39 percent of respondents, Arizona had 28 percent of respondents, and Colorado had 22 percent of respondents making these three states by far the most highly represented. There were no significant differences found between PWC operators and non PWC operators. It is interesting to note that of the 16 states represented by respondents to the mail-back survey, PWC operators account for only seven (Utah, Colorado, Arizona, Illinois, New Mexico, Oklahoma, and Oregon).

Half of the total sample have a college degree or beyond (Table D.4). Twenty-nine percent of respondents stated that they are college graduates, five percent stated that they have completed some graduate school, and 16 percent stated that they have a masters, doctoral, or professional degree. No statistical differences were found between PWC operators and non PWC operators.

Seventy-eight percent of respondents stated that they receive income of 40,000 dollars or more (Table D.5). Eighty-one percent of PWC operators have incomes of 40,000 dollars or more and 75 percent of non PWC operators have incomes of 40,000 dollars or more.

Survey respondents were very homogeneous with respect to ethnicity and race (Tables D.6 and D.7). Only five percent identified their ethnicity as Hispanic or Latino and 98 percent of respondents identified their race as white.

Table D.1. Gender of respondents.

Gender	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Male	167	72	60	73	106	71
Female	64	28	21	27	43	29
Total	231	100	81	100	149	100

Source: Mail-back survey, Question 15.

Table D.2. Age of respondents.

Respondent age	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
16-19	--	--	--	--	--	--
20-24	9	4	4	5	5	4
25-29	11	5	6	7	5	3
30-34	10	5	5	6	5	3
35-39	16	7	3	4	13	9
40-44	33	15	11	14	21	15
45-49	43	19	15	19	28	20
50-54	32	15	13	16	20	14
55-59	25	11	8	10	17	12
60-64	15	7	6	7	9	6
65-69	17	8	6	7	11	8
70 or older	11	5	4	5	7	5
Total	222	101*	81	100	141	99*

Source: Mail-back survey, Question 16.

Total sample: Mean age: 49.0 Median age: 49
PWC operators: Mean age: 48.2 Median age: 49
Non PWC operators: Mean age: 49.4 Median age: 49

*Percent does not add to 100 percent due to rounding error.

Table D.3. Permanent residence of respondents

State of residence	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Utah	90	39	33	40	57	38
Arizona	65	28	21	25	43	29
Colorado	52	22	25	30	27	18
California	7	3	--	--	7	5
Nevada	3	1	--	--	3	2
Michigan	2	1	--	--	2	1
Oregon	2	1	1	1	1	1
Washington	2	1	--	--	2	1
Alaska	1	<1	--	--	1	1
Iowa	1	<1	--	--	1	1
Illinois	1	<1	1	1	--	--
Maryland	1	<1	--	--	1	1
Minnesota	1	<1	--	--	1	1
New Mexico	1	<1	1	1	--	--
Oklahoma	1	<1	1	1	--	--
Wyoming	1	<1	--	--	1	1
Total	231	100	83	99*	147	100*

Source: Onsite survey.

*Percent does not add to 100% due to rounding error.

Table D.4. Response to “What is the highest level of education you have completed?”

Education level	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Some high-school	3	1	1	1	2	1
High school graduate or GED	30	14	13	16	17	12
Some college, business, or trade school	79	35	22	27	57	40
College graduate	64	29	25	31	39	28
Some graduate school	12	5	5	6	7	5
Masters, doctoral or professional degree	35	16	16	19	19	13
Total	223	100	82	100	141	99*

Source: Mail-back survey, Question 17.

*Percent does not add to 100% due to rounding error.

Table D.5. Response to “What was your total household income (before taxes) last year?”

Income level	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Less than \$15,000	4	2	1	1	3	2
\$15,000 to \$24,999	15	7	3	4	12	9
\$25,000 to \$39,999	30	14	11	15	19	14
\$40,000 to \$64,999	61	29	18	24	43	31
\$65,000 or more	104	49	43	57	61	44
Total	214	101*	76	101*	138	100

Source: Mail-back survey, Question 18.

*Percent does not add to 100% due to rounding error.

Table D.6. Response to “In what ethnicity would you place yourself?” by *Total sample*.

Ethnicity	Total sample	
	N	Percent
Not Hispanic or Latino	152	95
Hispanic or Latino	8	5
Total	160	100

Source: Mail-back survey, Question 19.

Table D.7. Response to “In what race would you place yourself?” by *Total sample*.

Race	Total sample	
	N	Percent
White	208	98
American Indian or Alaska Native	2	1
Asian	1	<1
Black or African American	1	<1
Native Hawaiian or other Pacific Islander	--	--
Total	212	100

Source: Mail-back survey, Question 19.

E. Visitor Motives

An understanding of visitors' motives for visiting a recreation resource is important to helping managers provide opportunities for visitors to attain the experiences they desire. To obtain a clearer awareness of visitors' motives for visiting Glen Canyon NRA, respondents were asked to look over a list of 29 possible experiences they may have had while visiting the area. Respondents were asked to rate the importance of possible experiences on a scale of 1 through 5, where 1= very unimportant, 2= unimportant, 3= neither unimportant nor important, 4= important, and 5= very important.

More than 75 percent of visitors rated "to enjoy the scenery of Lake Powell (mean 4.7)," "to get away from the usual demands of life (mean 4.3)," "to experience nature (mean 4.2)," and "to do something with my family (mean 4.2)," "to experience natural quiet (mean 4.1)," "to relax physically (mean 4.1)," "to use my own equipment (mean 4.0)," "to be with people who enjoy same things I do (mean 4.0)," and "to be close to nature (mean 4.0)" as important or very important experiences (Table E.1). More than 50 percent of visitors rated "to participate in ranger-led activities (mean 2.0)" and "to meet new people (mean 2.5)" as unimportant or very unimportant. No significant differences were found between PWC operators and non PWC operators for desired experiences. One experience, which can also be found in Appendix G, listed by respondents in addition to those found in the mail-back survey question was to "feel safe."

Table E.1. Response to “Indicate how important each experience was to you on your most recent visit to the area.”

Experience*	Total sample							PWC operators and Non PWC operators			
	Percent of respondents by response category**							PWC operators		Non PWC operators	
	N	Mean	1	2	3	4	5	N	Mean	N	Mean
To enjoy the scenery of Lake Powell	225	4.7	2	--	1	23	73	83	4.7	142	4.6
To get away from the usual demands of life	219	4.3	4	2	11	26	57	79	4.4	140	4.2
To experience nature	208	4.2	3	2	8	45	41	75	4.2	133	4.2
To do something with my family	212	4.2	7	3	13	23	55	80	4.3	132	4.1
To experience natural quiet	207	4.1	2	4	13	41	40	75	4.1	132	4.2
To relax physically	218	4.1	4	3	14	38	41	80	4.2	138	4.0
To use my own equipment	208	4.0	4	9	11	31	45	76	4.2	132	4.0
To be with people who enjoy same things I do	207	4.0	1	4	18	40	36	76	4.2	131	3.9
To be close to nature	210	4.0	2	3	17	48	31	78	4.0	132	4.0
To be away from other people	212	3.9	4	8	19	35	34	76	4.0	136	3.9
To experience solitude	211	3.9	5	5	18	41	31	77	3.9	134	3.9
To experience an undeveloped lake	203	3.8	4	8	22	33	33	72	3.7	131	3.9
To be with members of my group	201	3.8	4	7	24	34	32	74	4.0	127	3.8
To participate in recreational activities	216	3.8	6	9	18	38	30	79	3.9	137	3.7
To be on my own	210	3.7	8	11	17	30	35	75	3.6	135	3.8
To feel healthier	213	3.7	5	8	24	35	28	78	3.9	135	3.7
To stargaze	206	3.6	5	10	24	43	18	76	3.6	130	3.6
To experience new and different things	201	3.5	6	11	24	45	13	74	3.5	127	3.5
To think about my personal values	209	3.5	5	9	33	37	17	77	3.6	132	3.5
To have thrills and excitement	205	3.5	6	10	34	28	22	73	3.7	132	3.4

Table E.1 Continued.

Experience*	N	Mean	Total sample					PWC operators and Non PWC operators			
			Percent of respondents by response category**					PWC operators		Non PWC operators	
			1	2	3	4	5	N	Mean	N	Mean
To learn about the natural history of the area	208	3.4	5	10	35	38	12	75	3.3	133	3.5
To get exercise	209	3.4	6	9	38	31	16	76	3.6	133	3.3
To learn about the cultural history of the area	208	3.3	6	15	33	40	6	74	3.1	134	3.3
To test my skills and abilities	205	3.2	7	19	34	30	11	73	3.2	132	3.2
To challenge myself	200	3.1	9	16	40	22	13	74	3.2	126	3.1
To share my skill and knowledge with others	203	3.0	10	16	41	26	6	72	3.2	131	2.9
To be creative by doing something such as sketching, painting, taking photographs	204	2.9	14	18	38	22	8	74	2.9	130	2.9
To meet new people	204	2.5	22	30	31	14	3	72	2.3	132	2.5
To participate in ranger-led activities	201	2.0	35	32	30	2	2	72	2.0	129	2.0

Source: Mail-back survey, Question 2.

* Rank ordered by mean importance scores for total sample.

** Responses based on a 5-point scale: 1=very unimportant, 2=unimportant, 3=neither unimportant or important, 4=important, 5=very important.

F. Visitor Benefits

Natural areas provide a myriad of opportunities for visitors to gain psychological and physiological benefits. In fact, the opportunity to reap such benefits is one of the most valuable contributions recreational lands make to improve the well-being of visitors as well as the society in which we live. Whether benefits are personal, societal, economic, or environmental, the positive impact of both onsite and offsite benefits are an important consideration when developing management plans that effectively serve visitors, surrounding communities, and the environment.

To ascertain the benefits respondents derived from their visits to Glen Canyon NRA, they were asked to rate, for the experiences they indicated were either important or very important, along a 4-point scale (1=did not attain, 2=somewhat attained, 3=moderately attained, and 4=totally attained), how well they were able to attain the experiences they desired.

For the most part respondents reported being able to achieve desired experiences. With three exceptions, to learn about the natural history of the area, to learn about the cultural history of the area, and to participate in ranger-led activities, all mean scores were greater than 3 (Table F.1). The only significant difference in experience attainment found between PWC operators and non PWC operators was in the attainment of the experience "to be closer to nature." PWC operators had a slightly higher level of attainment for this experience.

Table F.1. Response to "... for each experience for which you circled either a 4 or 5, please indicate how much you were able to attain each of those experiences."

Experience*	Total sample						PWC operators and Non PWC operators			
	N	Mean	Percent of respondents by response category**				PWC operators		Non PWC operators	
			1	2	3	4	N	Mean	N	Mean
To enjoy the scenery of Lake Powell	191	3.9	--	2	12	87	68	3.9	123	3.8
To do something with my family	141	3.9	--	1	14	86	52	3.9	89	3.8
To use my own equipment	143	3.8	--	3	17	80	54	3.8	89	3.8
To get away from the usual demands of life	164	3.7	1	1	32	67	57	3.7	107	3.6
To be with members of my group	110	3.7	--	6	17	77	41	3.8	69	3.7
To experience nature	157	3.6	--	7	29	64	55	3.6	102	3.5
To relax physically	150	3.6	--	3	35	63	57	3.6	93	3.6
To be with people who enjoy same things I do	135	3.6	1	4	27	68	52	3.7	83	3.6
To be close to nature	142	3.6	1	6	29	65	49	3.7	93	3.5
To participate in recreational activities	130	3.6	2	5	24	69	49	3.7	81	3.6
To stargaze	113	3.6	5	2	25	68	41	3.6	72	3.5
To experience natural quiet	149	3.5	2	9	32	58	48	3.5	101	3.4
To feel healthier	118	3.5	1	6	38	55	44	3.6	74	3.4
To have thrills and excitement	100	3.5	2	7	35	56	41	3.6	59	3.4
To be away from other people	129	3.4	1	11	41	47	48	3.4	81	3.3
To experience solitude	133	3.4	2	5	47	46	49	3.4	84	3.4
To think about my personal values	94	3.4	--	9	42	50	33	3.5	61	3.4
To get exercise	87	3.4	--	9	44	47	39	3.4	48	3.3
To test my skills and abilities	77	3.4	1	8	40	51	27	3.4	50	3.4
To challenge myself	70	3.4	--	10	39	51	26	3.5	44	3.4
To experience an undeveloped lake	123	3.3	3	10	37	50	41	3.5	82	3.2
To be on my own	123	3.3	1	10	44	46	41	3.4	82	3.3
To experience new and different things	104	3.3	1	11	48	40	36	3.4	68	3.2

Table F.1. continued

Experience*	Total Sample						PWC operators and Non PWC operators			
			Percent of respondents by response category**				PWC operators		Non PWC operators	
	N	Mean	1	2	3	4	N	Mean	N	Mean
To be creative by doing something such as sketching, painting, taking photographs	58	3.3	7	5	36	52	18	3.6	40	3.2
To share my skill and knowledge with others	64	3.2	3	9	50	38	26	3.4	38	3.1
To meet new people	33	3.1	6	15	39	39	9	3.4	24	3.0
To learn about the natural history of the area	87	2.8	3	29	49	18	26	2.8	61	2.8
To learn about the cultural history of the area	79	2.8	3	30	51	17	24	2.9	55	2.8
To participate in ranger-led activities	12	1.9	8	17	25	--	4	2.8	8	1.5

Source: Mail-back survey, Question 2.

*Rank ordered by mean attainment scores of total sample.

** Responses based on a 4 point scale: 1=did not attain, 2=somewhat attained, 3=moderately attained, 4=totally attained.

■ Differences between groups are statistically significant at the $p < 0.05$ level.

G. Potential Problems

Problems visitors experience during their visits can diminish the quality of their experiences and hinder the attainment of benefits they may otherwise have gained. To assess the existence of potential problems at Glen Canyon NRA, respondents evaluated 23 possible situations they may have experienced on their most recent trip to the area. Study participants used a 5-point scale (1=no problem, 2=slight problem, 3=moderate problem, 4=serious problem, 5=very serious problem) to rate each situation.

Overall, respondents did not experience many problematic situations during their visit. In all but one situation, "litter on beaches and shoreline," more than 50 percent of respondents indicated that the situation was not a problem (Table G.1). Situations rated as most problematic were "litter on beaches and shoreline," "unsafe operation of personal watercraft," "people being inconsiderate," "too many personal watercraft on the lake," "boats closer to my boat than I like," "finding beach campsite," and "finding an unoccupied campsite." One quarter (25 percent) or more of respondents rated these situations as a moderate to very serious problem. Although these were the most problematic situations, it should be noted that the highest mean rating was only 2.1 (slight to moderate problem) for "litter on beaches and shoreline." Some significant differences were found between PWC operators and non PWC operators. PWC operators were significantly less likely than non PWC groups to report a problem with other PWC operators. PWC operators were less likely than non PWC operators to find the unsafe operation of PWCs, too many PWCs on the lake, and conflicts with PWC operators problematic. Other situations listed by respondents can be found in Appendix G. Some examples include tour boat wakes, dirty restrooms, and inexperienced/rental watercraft operators.

In addition to the list of possible situations they may have experienced, visitors were also asked whether or not they observed unsafe boating practices, and whether or not they felt safe during their visit. In answer to the question "Did you observe any unsafe boating practices on your most recent visit to Glen Canyon NRA?" Seventy-five percent of respondents stated seeing no unsafe boating practices (Table G.2). There were no significant differences between PWC operators and non PWC operators although PWC operators reported slightly fewer observations of unsafe boating practices. Unsafe boating practices reported by respondents can be found in Appendix G. Some examples include bow riding on motorboats, other watercraft approaching too closely, and the unsafe operation of personal watercraft.

In answer to the question "Did you feel safe on your most recent visit to Glen Canyon NRA?" Ninety-seven percent of respondents stated that they did feel safe during their visit (Table G.3). There were no significant differences between PWC operators and non PWC operators. Reasons for not feeling safe can be found in Appendix G. Some examples include boats approaching too closely and the unsafe operation of personal watercraft.

Table G.1. Situations respondents may have experienced while visiting Glen Canyon National Recreation Area.

Situation*	Total sample							PWC operators and Non PWC operators			
	Percent of respondents by response category**							PWC operators		Non PWC operators	
	N	Mean	No problem	Slight problem	Moderate problem	Serious problem	Very serious problem	N	Mean	N	Mean
Litter on beaches and shoreline	214	2.1	36	37	18	5	5	78	2.1	132	2
Unsafe operation of personal watercraft	222	2.0	58	16	5	12	10	80	1.8	141	2.1
People being inconsiderate	223	1.9	51	21	17	6	6	80	1.9	142	2.0
Too many personal watercraft on the lake	222	1.9	62	10	10	9	10	79	1.7	142	2.1
Boats closer to my boat than I like	220	1.9	57	17	15	5	6	78	1.8	141	1.9
Finding beach campsite	198	1.8	58	16	19	6	2	71	1.9	126	1.8
Finding an unoccupied campsite	202	1.7	61	14	16	6	3	76	1.8	125	1.7
Unsafe operation of motorized boats	222	1.6	62	22	10	4	3	80	1.6	141	1.7
Conflicts with personal watercraft operators on lake	219	1.6	70	13	6	6	6	78	1.4	140	1.8
Evidence of pets and their droppings	216	1.6	66	18	8	3	4	76	1.6	139	1.6
Human waste on shore or in water	209	1.6	69	13	11	1	5	75	1.7	133	1.5
Sufficient navigational aids on Lake Powell	219	1.5	70	15	12	2	1	78	1.5	140	1.5
Adequate floating toilet facilities on lake	192	1.5	72	13	6	6	3	69	1.6	122	1.5
Lack of National Park Service presence on the lake	211	1.5	77	12	3	3	5	75	1.6	135	1.4
Poor water quality	210	1.4	78	11	8	3	0	74	1.5	135	1.3
Too many motorized boats on the lake	223	1.4	74	14	8	3	2	79	1.5	143	1.4
Too many commercial tour boats	223	1.4	78	11	7	3	2	79	1.3	143	1.5
Too much noise on the lake	225	1.4	74	15	8	1	3	79	1.3	145	1.5
Confusion about rules and regulations	220	1.4	79	12	5	3	1	76	1.4	143	1.3
Conflicts with others for beach space	217	1.3	74	19	7	1	0	78	1.4	138	1.3
Adequate toilet facilities on lake	219	1.3	83	10	6	1	1	81	1.4	137	1.2

Table G.1 Continued.

Situation*	Total sample							PWC operators and Non PWC operators			
	Percent of respondents by response category**							PWC operators		Non PWC operators	
	N	Mean	No problem	Slight problem	Moderate problem	Serious problem	Very serious problem	N	Mean	N	Mean
Evidence of livestock	211	1.3	83	9	4	1	3	76	1.4	134	1.3
Noise from airplanes	215	1.3	83	10	5	<1	2	77	1.2	137	1.4
Too much light on lake at night	220	1.1	94	5	<1	<1	--	80	1.1	139	1.1
Too much light at the marinas at night	207	1.1	93	5	1	--	1	79	1.1	127	1.1
Evidence of mining operations	203	1.1	95	4	2	--	--	74	1.1	128	1.1
Enough ranger-led activities	154	1.1	96	1	3	--	--	59	1.1	94	1.1

Source: Mail-back survey, Question 7.

* Rank ordered by mean scores of total sample.

** Responses based on a 5-point scale: 1=no problem, 2=slight problem, 3=moderate problem, 4=serious problem, 5=very serious problem.

■ Differences between groups are statistically significant at the p<0.05 level.

Table G.2. Response to: “Did you observe any unsafe boating practices on your most recent visit to Glen Canyon National Recreation Area?”

Observed unsafe boating practices	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
No	173	75	63	78	109	73
Yes	58	25	18	22	40	27
Total	231	100	81	100	149	100

Source: Mail-back survey, Question 9.

Table G.3. Response to: “Did you feel safe on your most recent visit to Glen Canyon National Recreation Area.”

Felt safe	Total sample		PWC operators		Non PWC operators	
	N	Percent	N	Percent	N	Percent
Yes	225	97	79	98	145	97
No	6	3	2	2	4	3
Total	231	100	81	100	149	100

Source: Mail-back survey, Question 10.

H. Crowding at Specific Locations

It is important to recognize that different types of visitors may have different perceptions of crowding and that their perceptions are often based on the types of experiences they seek. As recreational use of natural areas increases, crowding has the potential to impede the attainment of visitors' desired experiences, particularly for visitors seeking solitude. Perceptions of feeling crowded can lead to changes in visitor behavior and use patterns. For example, visitors may choose to recreate at a site during seasons when use is not as intense. For some visitors, crowding may interfere with their recreational goals to the point where they select alternative sites to pursue their desired experiences. Displacement becomes problematic when suitable substitutes are difficult to find or are simply unavailable.

To determine sites of potential crowding at Glen Canyon NRA, study participants were asked to evaluate the acceptability of their encounters at five locations within the area. Using a 7-point scale (1=very unacceptable, 7=very acceptable), respondents rated the acceptability of encounters with watercraft for each location they had visited. Respondents who stated that they encountered an unacceptable number of watercraft were then asked to provide the reasons for unacceptable encounters. These reasons could be the number of watercraft, the type of watercraft, something else, or a combination of the three.

The majority of respondents, 73 percent or more in all locations, indicated that all the listed locations (on the lake surface, on the lake shore, at fueling docks, at boat landings, while at campsite) had acceptable numbers of watercraft (Table H.1). For those who stated there were unacceptable numbers of watercraft, the reason most often given was the number of watercraft. For respondents who selected "something else" the reasons identified were the unsafe operation of watercraft and the inconsiderate behavior of other visitors. There were no significant differences between PWC operators and non PWC operators (Tables H.2 and H.3). In all cases, the mean scores from the two groups were 5.5 or higher.

Table H.1. Acceptability of the number of watercraft at various locations while visiting Glen Canyon NRA, by *total sample*.

Location*	Percent of respondents by acceptability of watercraft numbers**									If respondent circled 1,2, or 3: reasons for unacceptable encounters.				
			Very Unacceptable			Very Acceptable			Number of watercraft	Type of watercraft	Something else	Number, type, and something else		
	N	Mean	1	2	3	4	5	6					7	N
On the lake surface	223	5.8	3	<1	5	9	15	24	44	19	42	21	11	26
On the lake shore	220	5.8	2	1	6	6	19	21	45	19	58	11	5	26
At fueling docks	216	5.8	5	1	2	7	17	21	48	10	50	--	10	40
At boat landings	219	5.7	3	3	3	11	12	24	43	16	56	--	19	25
While at campsite	217	5.7	3	4	7	9	12	21	45	22	46	9	18	28

Source: Mail-back survey, Question 8.

*Rank ordered by mean scores of total sample.

**Responses based on a 7-point scale: 1= very unacceptable through 7= very acceptable.

Table H.2. Acceptability of the number of watercraft at various locations while visiting Glen Canyon NRA, by *PWC operators*.

Location*	Percent of respondents by acceptability of watercraft numbers**									If respondent circled 1,2, or 3: reasons for unacceptable encounters.				
				Very Unacceptable			Very Acceptable							
	N	Mean	1	2	3	4	5	6	7	N	Number of watercraft	Type of watercraft	Something else	Number, type, and something else
On the lake shore	77	5.8	4	--	4	4	18	30	40	6	83	--	--	17
On the lake surface	78	5.7	6	--	4	4	17	30	40	7	57	29	--	14
While at campsite	61	5.6	5	2	7	5	13	31	38	6	67	17	--	17
At fueling docks	60	5.6	10	--	2	5	13	28	42	5	60	--	--	40
At boat landings	75	5.5	8	3	3	8	11	32	36	8	--	75	13	12

Source: Mail-back survey, Question 8.

* Rank ordered by mean scores of total sample.

** Responses based on a 7-point scale: 1= very unacceptable through 7= very acceptable.

Table H.3. Acceptability of the number of watercraft at various locations while visiting Glen Canyon NRA, by *non PWC operators*.

Location*	Percent of respondents by acceptability of watercraft numbers**									If respondent circled 1,2, or 3: reasons for unacceptable encounters.				
				Very Unacceptable			Very Acceptable							
	N	Mean	1	2	3	4	5	6	7	N	Number of watercraft	Type of watercraft	Something else	Number, type, and something else
On the lake surface	144	5.9	1	--	6	11	14	22	47	12	33	17	17	33
At fueling docks	97	5.9	2	2	2	8	19	17	50	5	40	--	20	20
On the lake shore	130	5.8	1	2	7	8	20	15	48	13	46	15	8	31
At boat landings	133	5.8	1	4	3	14	13	19	47	8	--	38	25	39
While at campsite	108	5.6	2	5	7	11	12	15	48	16	38	6	25	30

Source: Mail-back survey, Question 8.

* Rank ordered by mean scores of total sample.

**Responses based on a 7-point scale: 1= very unacceptable through 7= very acceptable.

I. Management Actions

An understanding of visitors' management preferences can aid the development of management actions that address issues of PWC use, protects the resource, and provides quality recreational opportunities. Respondents' level of support or opposition for 26 specific actions at Glen Canyon NRA was determined by examining their responses as rated on a 5-point scale (1=strongly oppose, 2=oppose, 3=neither oppose nor support, 4=support, 5=strongly support).

The management actions supported or strongly supported by at least two-thirds of total sample were to aggressively enforce safety rules and regulations on lake, provide more information to visitors about appropriate behavior, provide visitors with natural history information about the area, and use management controls to prevent damage to the environment by visitors (Table I.1). More than 80 percent of the total sample opposed or strongly opposed prohibiting motorized watercraft on the lake and prohibiting non-motorized watercraft on the lake. More than 60 percent of total sample opposed or strongly opposed limiting the number of non-motorized watercraft allowed on the lake at any one time, prohibiting personal watercraft on the lake, limiting the number of people per group allowed on lake, and restricting the number of people using the lake at any one time.

Significant differences were found between PWC operators and non PWC operators on one potential management action, to prohibit personal watercraft on the lake. PWC operators, mean score 1.7, opposed this action more strongly than did non PWC operators, mean score 2.4. Other management actions proposed by visitors can be found in Appendix G. Some examples include pet control, improved navigational aids, and providing more toilet facilities.

Table I.1. Response to: “Given the conditions in the Glen Canyon National Recreation Area, to what extent do you ‘oppose’ or ‘support’ each of the following possible management actions.”

Management Action*	Total sample							PWC operators and Non PWC operators			
	Percent of Respondents by Response Category**							PWC operators		Non PWC operators	
	N	Mean	Strongly oppose	Oppose	Neither support nor oppose	Support	Strongly support	N	Mean	N	Mean
Aggressively enforce safety rules and regulations on lake	226	3.9	4	7	18	39	31	82	3.9	143	3.8
Provide more information to visitors about appropriate behavior	224	4.0	3	1	21	44	31	80	4.0	143	4.0
Provide visitors with natural history information about the area	224	3.8	<1	3	31	50	16	82	3.8	141	3.8
Use management controls to prevent damage to the environment by visitors	225	3.7	5	7	21	50	17	82	3.6	142	3.7
Provide more toilet facilities at landings	225	3.6	3	4	41	40	12	83	3.5	141	3.6
Provide more park rangers on the lake to educate visitors about appropriate behavior.	224	3.5	5	9	32	33	21	80	3.6	143	3.5
Use management controls to prevent conflicts between lake users	222	3.3	9	12	29	41	10	81	3.2	140	3.4
Establish “off-limit” zones to protect sensitive resources	223	3.1	18	18	12	40	12	82	3.1	140	3.2
Improve public access to the lake	224	3.1	15	13	30	26	15	82	3.1	141	3.2
Expand the number of marina slips	225	3.1	13	12	37	22	15	83	3.2	141	3.1
Restrict personal watercraft use to designated areas only	225	3.0	24	20	12	18	26	82	2.5	142	3.4
Restrict further facility development and expansion	226	3.0	10	27	28	24	12	82	2.8	143	3.1

Table I.1 Continued.

Management Action*	Total sample							PWC operators and Non PWC operators			
	N	Mean	Percent of respondents by response category**					PWC operators		Non PWC operators	
			Strongly oppose	Oppose	Neither support nor oppose	Support	Strongly support	N	Mean	N	Mean
Require visitors to learn about appropriate behavior on the lake (e.g., watch a short video presentation)	222	3.0	10	22	36	21	12	80	3.0	141	3.1
Limit number of personal watercraft allowed on lake at any one time	224	2.9	24	21	16	22	17	82	2.5	141	3.1
Close area to pets	226	2.7	24	18	34	13	12	83	2.7	142	2.7
Zone the waters to provide specific uses at specific places	224	2.6	28	23	16	22	10	82	2.4	141	2.8
Limit number of houseboats allowed on lake at any one time	224	2.6	28	22	25	14	11	82	2.5	142	2.6
Limit number of boats allowed on lake	222	2.5	28	26	23	16	7	82	2.6	139	2.4
Limit number of motorized watercraft allowed on lake at any one time	225	2.5	27	28	21	18	5	83	2.5	141	2.5
Prohibit drinking alcoholic beverages on the lake	227	2.5	26	28	23	11	12	83	2.7	143	2.5
Restrict number of people using lake at any one time	225	2.2	32	30	23	11	4	82	2.2	142	2.3
Limit number of people <i>per group</i> allowed on lake	224	2.2	36	27	22	12	3	82	2.1	141	2.3
Prohibit personal watercraft on the lake	225	2.1	43	26	13	8	9	83	1.7	141	2.4
Limit number of non-motorized watercraft allowed on lake at any one time	225	2.0	39	30	23	5	4	83	2.1	141	2.1
Prohibit non-motorized watercraft on the lake	226	1.7	55	27	16	1	1	83	1.7	142	1.6
Prohibit motorized watercraft on the lake	227	1.4	70	19	10	1	<1	83	1.4	143	1.5

Source: Mail-back survey, Question 11.

* Rank ordered by mean scores of total sample.

** Responses based on a 5-point scale: 1=strongly oppose, 2=oppose, 3=neither support or oppose, 4=support, 5=strongly support.

■ Differences between groups are statistically significant at the p<0.05 level.

J. Service Quality and Visitor Satisfaction

Visitor feedback regarding satisfaction with their experiences and their ideas regarding services that they would like to see offered at Glen Canyon NRA is important to evaluating how well visitors perceive their needs are being met. Additionally, this information can help determine visitors' satisfaction with their visits and how well they were able to attain their desired experiences and receive the associated benefits.

Respondents were asked to rate their satisfaction with the services provided at Glen Canyon NRA. Items were rated by respondents on a scale from 1= dissatisfied, 2= somewhat dissatisfied, 3= neither dissatisfied nor satisfied, 4= somewhat satisfied, 5= satisfied. Overall, visitors were satisfied with the quality of services at Glen Canyon NRA. When asked about their overall experience the majority (63 percent) stated that they were satisfied (Table J.1). Two-thirds of the total sample were satisfied or somewhat satisfied with visitor information, facilities within the area, and exhibits and other educational material. Park ranger-led activities received the lowest rating with a mean score of 3.5. However, it is worth noting that 60 percent of respondents stated they were neither satisfied nor dissatisfied with ranger-led activities. Other activities and services suggested by respondents can be found in Appendix G. Some examples include shuttle boat services, sailboat instruction, and guided tours to cultural sites such as "rock art" and ruins. Although there is some variation in the ranking of the quality of concessionaire services, there are no significant differences between personal water operators and non PWC operators with their satisfaction of services offered at Glen Canyon NRA.

Visitors were asked to rate their level of agreement with a number of statements about Glen Canyon NRA. Items were ranked by respondents on a scale from 1= strongly disagree, 2= disagree, 3= neither disagree nor agree, 4= agree, 5= strongly agree. Visitors enjoyed their visit to Glen Canyon NRA. The majority of respondents (97 percent) agreed or strongly agreed with the statement (Table J.2), "Overall, I was satisfied with my most recent trip to Glen Crayon." Likewise, 99 percent of all respondents agreed or strongly agreed with the statement, "I enjoyed my time on Lake Powell." Ninety-three percent agreed or strongly agreed with the statement, "I enjoyed the natural quiet." Statements most highly disagreed with were, "I did not have the kind of experience I was looking for" (90 percent strongly disagreed or disagreed), "The trip was not worth the money it cost" (83 percent strongly disagreed or disagreed), and "I stayed off the lake during certain parts of the day because there were too many boats on the lake" (77 percent strongly disagreed or disagreed). The only significant difference found between PWC operators and non PWC operators was with the statement "the presence of personal watercraft interfered with the quality of my boating experience." Twelve percent of PWC operators agreed or strongly agreed with this statement compared to 28 percent of non PWC operators.

Table J.1. Response to “How satisfied were you with the quality of the services provided for you at Glen Canyon National Recreation Area.”

Service *	Total sample							PWC operators and Non PWC operators			
	N	Mean	Percent of Respondents by Response Category**					N	Mean	N	Mean
			Dissatisfied	Somewhat Dissatisfied	Neither Dissatisfied nor Satisfied	Somewhat Satisfied	Satisfied				
Overall quality of services	217	4.3	3	6	12	18	63	77	4.3	139	4.4
Visitor information	185	4.2	2	4	24	12	58	68	4.1	116	4.3
Facilities within the area	209	4.2	3	3	19	15	60	75	4.1	133	4.3
Exhibits and other educational material	177	4.1	2	5	28	12	54	65	4.0	111	4.2
National Park Service employee assistance	153	4.0	5	7	25	6	58	57	4.0	95	4.1
Concessionaire lodging	147	3.9	3	6	35	12	44	57	3.8	89	3.9
Concessionaire retail stores	197	3.9	6	8	23	13	50	71	3.9	125	4.0
Concessionaire assistance	162	3.9	5	8	27	16	44	60	3.7	101	4.0
Concessionaire food service	175	3.8	5	12	23	19	40	64	3.7	110	3.8
Park ranger-led activities	11	3.5	4	4	60	5	28	46	3.5	64	3.5

Source: Mail-back survey, Question 12.

* Rank ordered by mean score of total sample.

** Responses based on a 5-point scale: 1=dissatisfied, 2=somewhat dissatisfied, 3=neither dissatisfied nor satisfied, 4=somewhat satisfied, 5=satisfied.

Table J.2. Extent to which respondents agreed with statements about their most recent visit to Glen Canyon NRA.

Statement *	Total Sample							PWC operators and Non PWC operators			
	N	Mean	Percent of Respondents by Response Category**					PWC operators		Non PWC operators	
			Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	N	Mean	N	Mean
I enjoyed my time on Lake Powell	230	4.8	0	0	1	21	78	82	4.8	147	4.8
Overall, I was satisfied with my most recent trip to Glen Canyon	230	4.6	1	<1	2	34	63	82	4.6	147	4.6
I enjoyed the natural quiet	230	4.4	0	2	6	40	53	82	4.5	147	4.4
My camping experience was improved by the quality of the night sky	225	4.2	<1	1	19	42	38	80	4.1	144	4.2
I thought the area and its surroundings were in good condition	228	4.0	1	4	12	59	25	82	4.1	145	4.0
I enjoyed the interpretive programs	209	3.1	2	1	85	8	3	74	3.1	134	3.1
The presence of personal watercraft interfered with the quality of my boating experience	222	2.6	27	23	28	13	10	77	2.1	144	2.8
The lighting at the marinas positively affected my visit	226	2.6	19	19	46	13	4	80	2.6	145	2.6
I avoided parts of the lake because there were too many boats there	227	2.2	36	22	12	15	5	81	2.2	145	2.3
I stayed off the lake during certain parts of the day because there were too many boats on the lake	227	1.9	41	36	19	4	1	82	1.9	144	1.9
The trip was not worth the money it cost	228	1.7	54	29	10	5	1	82	1.7	145	1.7
I did not have the kind of experience I was looking for	227	1.6	55	35	4	4	3	81	1.7	145	1.6

Source: Mail-back survey, Question 14.

* Rank ordered by mean scores of total sample.

** Responses based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree, 5=strongly agree.

■ Differences between groups are statistically significant at the p<0.05 level.

K. Open-ended Comments

Over half (53 percent) of the respondents offered open-ended comments about their visit to Glen Canyon NRA (Table K.1). While this is anecdotal information, it gives managers insight into other aspects of visitors' perceptions and opinions. Comments ranged from simple to comprehensive and include suggestions about services and management, complimentary statements about visitors' experiences, and opinions about situations on the lake such as rental and timeshare houseboat issues and personal watercraft. Appendix H lists verbatim comments made by respondents on the mail-back survey.

Table K.1. Open-ended comments.

Open-ended Comments	Total sample	
	N	Percent
Yes	122	53
No	109	47
Total	231	100

Source: Mail-back survey, Question 20.

Discussion and Recommendations

Findings of the first phase of the three-part visitor study at Glen Canyon NRA allow managers, planners, and others to better understand the characteristics and perspectives of fall visitors. In addition to providing basic demographic information, the study gives insight into visitor motives, benefits derived from experiences at the NRA, potential problems, perceptions of crowding, degree of support for specific management actions, and general visitor satisfaction. Without such information, decisions affecting future management of Glen Canyon NRA would be based primarily on speculation of visitor experiences and opinions.

Comparisons were conducted between two groups of visitors to Glen Canyon NRA, PWC operators and non PWC operators. PWC operators made up 37 percent of the fall sample. They were an average of 48.2 years old. Seventy-three percent of PWC operators were male. They were mostly from Utah, Colorado, and Arizona, with only four other states represented. Thirty-one percent had completed college, and 25 percent were in the process of or had received an advanced degree. Eighty-one percent had incomes of \$40,000 or more. Groups of PWC operators tended to be slightly larger than groups of non PWC operators. Groups of PWC operators had a mean size of 6.6 individuals. Most PWC operators were repeat visitors to Glen Canyon NRA. The mean number of nights groups spent in the area was 5.0. The most common activities PWC operators reported participating in were motor boating, camping at shoreline campsites, fishing, swimming, and hiking Lake Powell side canyons.

Many PWC operators were associated with houseboat use. Slightly more than one-third reported using a houseboat as their primary vessel. The most popular areas for PWC operators to visit were the zones that include Rainbow Bridge, Wahweap, Bullfrog and Halls marinas, Defiance House Ruin, Warm Creek, and Escalante. Visiting Glen Canyon NRA was the primary purpose behind most PWC operators visit to the area. The top ranked experiences PWC operators wanted during their visit were to enjoy the scenery of Lake Powell, to get away from the usual demands of life, to do something with their family, to experience nature, to relax physically, to use their own equipment, and to be with people who enjoy the same things they do.

Non PWC operators made up the majority, 63 percent, of the fall sample. The average age of non PWC operators was 49.4. There were more males, 71 percent, than females. Most non PWC operators were from Utah, Arizona, or Colorado with a small percentage of visitors representing 10 other states. Twenty-eight percent had graduated from college, and 18 percent were in the process of or had completed an advanced degree. Seventy-five percent had incomes of more than \$40,000. Groups of non PWC operators tended to be slightly smaller than PWC operators. Groups of non PWC operators had a mean size of 4.6 individuals. Most non PWC operators were repeat visitors to Glen Canyon NRA. The mean number of nights groups spent in the area was 4.1. The most common activities non PWC operators reported participating in were motor boating, fishing, camping at shoreline sites, hiking Lake Powell side canyons, and visiting archaeological sites.

Over half of non PWC operators used a powerboat as their primary vessel. The most popular areas for them to visit on Lake Powell were the zones that that include Wahweap,

Rainbow Bridge, Warm Creek, Bullfrog and Halls marinas, and Padre Bay. Visiting Glen Canyon NRA was the primary purpose behind most non PWC operators visit to the area. The top ranked experiences non PWC operators wanted during their visit were to enjoy the scenery of Lake Powell, to get away from the usual demands of life, to experience nature, to experience natural quiet, and to do something with their family.

Analysis of visitor data indicated that there were a few statistically significant differences between PWC and non PWC operators. There were some significant differences in activity participation, primary watercraft usage, situations experienced, and support of various management actions to address problems. Identifying and evaluating these differences can help managers understand the scope of potential and real conflict occurring at Glen Canyon and can provide them a basis with which to institute various management actions designed to reduce and manage conflict between these two groups at Glen Canyon NRA.

Conflict can be simply defined as real or perceived goal blocking caused by the behavior of others. Four components have been identified as possible sources of conflict. They are differences in activity style, resource specificity, mode of experience, and lifestyle tolerance (Jacob and Schreyer 1980). Levels of potential conflict can be assessed by looking for differences between PWC operators and non PWC operators in these four categories.

Activity style refers to differences in activity participation and method of pursuing an activity. Conflict could arise if these activities were perceived as being exclusive of each other and were occurring in the same geographic location. For example a PWC operator who is seeking thrills and performing stunts on PWCs may interfere with the ability of an angler to stalk fish. The angler's goal of catching fish would be blocked. Compared to non PWC operators, PWC operators are more likely to engage in activities such as using a personal watercraft, swimming, and participating in watersports. Non PWC operators, though, are more likely than PWC operators to bird watch. Not all of these differences in activity participation would necessarily cause conflict.

Resource specificity refers to the level of value a visitor holds to a specific resource, in this case Lake Powell. Conflict could arise if both subgroups have a high level of place attachment to Lake Powell and its surrounding environs. If the subgroups are different in terms of their activity style, mode of experience, and have low lifestyle tolerance this could result in competition for the resource. Resource specificity can be assessed by two factors, the importance of visitors' motives towards visiting the area and the number of visits they have made to Glen Canyon NRA in the past. The majority of both PWC and non PWC operators reported that visiting Glen Canyon NRA was the primary purpose of their visit to the area, and both had a relatively high number of previous visits, indicating that place attachment to Lake Powell may be high. If both groups hold a strong sense of attachment to Lake Powell and that attachment is based on different reasons, they may be more likely to come into conflict because they have to share or compete for an important resource.

Mode of experience refers to the types of experiences visitors desire during their visit to Glen Canyon NRA and can be assessed by the level of importance respondents ascribed

to those experiences. Experiences that are exclusive of each other have the potential of causing conflict if those experiences are sought after in the same geographic location. For example, if a PWC operator is desirous of achieving the experience “to be on my own” and a houseboat operator is trying to achieve the experience “to meet new people” and they are camped in the same area, there is the potential for conflict. PWC and non PWC operators did not show much difference in desired experience, however non PWC operators were less likely to achieve the experience of being close to nature than were PWC operators. It is unlikely that the mode of experience between the two groups differs enough to create conflict.

Lifestyle tolerance refer to the degree of acceptance an individual has toward people who are different from one another. In this case that would mean people who have different activity styles and modes of experience. Data on safety, crowding, and visitor support of management actions can be used to determine respondents’ sensitivity to other resource users. For example, a non PWC operator who has never had direct contact with PWC operators and strongly supports management that would ban PWCs from the area, is probably indicative of low lifestyle tolerance. Non PWC operators were significantly more likely to support the management actions of prohibiting PWCs on the lake than were PWC operators.

There were also some significant differences between PWC and non PWC operators in terms of problems they encountered. Non PWC operators were more likely than PWC operators to report unsafe operation of PWCs, too many PWCs, and conflicts with PWC operators on the lake as problems. Also, non PWC operators were more likely to agree with the statement "the presence of personal watercraft interfered with the quality of my boating experience" than were PWC operators. From these responses it appears likely that that there is a degree of conflict occurring between the two groups, that perceived conflict may be asymmetrical (that is non PWC operators are more likely to be in conflict with PWC operators than the reverse) and that conflict may be rooted in behavior and safety issues.

Overall, differences between the groups were slight. It appears that there is not much direct conflict occurring between PWC and non PWC operators at Glen Canyon NRA during the fall use period. There are still some potential areas for conflict that could be addressed by management to further reduce the possibility of conflict and ensure the opportunity for visitors to obtain high quality experiences and the attainment of desired benefits. Management controls to prevent conflicts between PWC and non PWC operators such as restricting or limiting PWC use to specific areas may be appropriate. These actions might be particularly appropriate in zones with low overall use and high potential for providing solitude opportunities such as the western portion of zone 9 (Escalante River) and zone 8 (San Juan River). Other generally acceptable management actions that address conflict include providing more information to visitors about appropriate behavior and aggressively enforcing safety rules and regulations on the lake. These actions would address some of the safety concerns expressed by visitors such as the unsafe operation of PWCs, which was the second highest ranked problem at Glen Canyon.

Growing numbers of recreationists along with the evolution of new outdoor recreation equipment will continue to challenge managers and planners as they seek to protect biophysical resources while providing opportunities for quality visitor experiences. At Glen Canyon NRA, study results show that respondents reported few problems and were generally satisfied with their experiences and the condition of the surroundings at Lake Powell. However, to ensure that current levels of satisfaction are maintained for future visitors, close attention should be given to strategies designed to minimize conflict so that Glen Canyon NRA can continue to provide a range of recreational opportunities for visitors that will result in diverse and valuable benefits to visitors, society, and the environment.

Literature Cited

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Jacob, G., and Schreyer, R. 1980. Conflict in Outdoor Recreation: A Theoretical Perspective. *Journal of Leisure Research*, 12, 368-80.

Appendix A

Onsite Survey



Glen Canyon National Recreation Area Visitor Survey

Date: _____

Location: _____

Group # _____ Individual # _____

Thank you for visiting Glen Canyon National Recreation Area! Your willingness to complete this form is appreciated. Your feedback will provide us with important information and will be used to enhance visitor services and improve resources management in the area.

Name (please print): _____

Permanent mailing address: _____

City: _____ State: _____ ZIP Code: _____

1. Approximately how many times (*ever*) have you visited Glen Canyon National Recreation Area?

____ Total number of visits (*including this visit*)

2. While visiting the Glen Canyon area on this trip how many nights did you spend?

____ I did not spend any nights in the Glen Canyon area

____ On Lake Powell ____ In a campground ____ In an area hotel/motel ____ at home ____ other (specify):

3. Visiting Glen Canyon National Recreation Area is (*check one*)

____ The primary purpose of my visit to the area

____ One of several important things I planned to do during my visit to the area

____ Something I decided to do *after* arriving in the area.

4. What is your gender? ____ Female ____ Male

5. What is your age? _____ years

6. We would like to know more about your visit to Glen Canyon National Recreation Area. Would you be willing to fill out a mailback questionnaire about your experience while visiting the Glen Canyon area? Your involvement is voluntary. Completing the questionnaire will take less than 20 minutes and the results will be completely confidential.

____ Yes, I am willing to complete a mailback questionnaire.

____ No

Thank you!

Appendix B

Group Log



**Glen Canyon National
Recreation Area Visitor Survey
Group Log**

Group #: _____

completed cards from group: _____

Date: _____ Location of contact: _____

Launch date: _____ Launch site: _____

ZONE(s) where spent most of time on lake (show group the map and ask them to point out the location):

1 2 3 4 5 6 7 8 9 10 11 12 13

Number of people in party: _____ people

Type of group: ___ Alone ___ Family and friends ___ Business ___ Tour ___ Other

Type and Number of watercraft used on this trip (enter number by each type of watercraft)

___ No watercraft used during visit

___ Houseboat

___ Canoe

___ Powerboat

___ Kayak

___ Personal watercraft

___ Sailboat

___ Raft (motor)

___ Inflatable toys

___ Raft (no motor)

___ Other (specify): _____

Number and type of pets traveling with group: _____ Number of pets. Type of Pets: _____

Notes:

Appendix C

Mail-Back Survey



Glen Canyon National Recreation Area 1999-2000 Visitor Survey

OMB # #1024-0224 (NPS99-024)
Expires: 5/31/01

Survey # _____

Date Contacted in the Recreation Area _____

Dear visitor,

Thank you for agreeing to share your opinions about your most recent visit to Glen Canyon National Recreation Area! This study is being conducted as a joint effort between the University of Minnesota and the National Park Service. Your feedback will provide us with important information and will be used to enhance visitor services and improve resources management at Glen Canyon National Recreation. For more information about Glen Canyon National Recreation Area, please visit the web site at www.nps.gov/glca or contact the office at (520) 608-6200.



About Your Trip to Glen Canyon National Recreation Area

1. Please look at the list of activities below. Place a check next to the primary activities you spent time doing during your most recent visit to Glen Canyon National Recreation Area. (*check all that apply*)

- | | |
|--|--|
| <input type="checkbox"/> Hiking in front-country | <input type="checkbox"/> Sailing |
| <input type="checkbox"/> Hiking in back-country | <input type="checkbox"/> Paddling (canoe or kayak) |
| <input type="checkbox"/> Hiking Lake Powell side canyons | <input type="checkbox"/> Using a personal watercraft |
| <input type="checkbox"/> Camping at developed campsites
(main marina locations) | <input type="checkbox"/> Participating in water sports |
| <input type="checkbox"/> Camping at shoreline campsites | <input type="checkbox"/> Swimming |
| <input type="checkbox"/> Camping at primitive sites in the back-country | <input type="checkbox"/> Mountain Biking |
| <input type="checkbox"/> Fishing | <input type="checkbox"/> Driving (Burr Trail, Hole in the Rock Road) |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Visiting archaeological sites |
| <input type="checkbox"/> Tour boat ride | <input type="checkbox"/> Bird watching |
| <input type="checkbox"/> Motor boating | <input type="checkbox"/> Wildlife watching |
| | <input type="checkbox"/> Other (please list) _____ |

Reasons For Your Visit to Glen Canyon National Recreation Area

2. Below is a list of possible experiences visitors may have while visiting the Glen Canyon National Recreation Area. Please look over the list of possible experiences. After you have looked over the list, indicate how important each experience was to you on your most recent visit to the area. Then, *for each experience for which you circled either a 4 or 5*, please indicate how much you were able to attain each of those experiences.

Experience	Very Unimportant	Unimportant	Neither Unimportant Nor Important	Important	Very Important	Did not Attain	Somewhat Attained	Moderately Attained	Totally Attained
To be on my own	1	2	3	4	5	1	2	3	4
To use my equipment	1	2	3	4	5	1	2	3	4
To experience an undeveloped lake	1	2	3	4	5	1	2	3	4
To experience nature	1	2	3	4	5	1	2	3	4
To experience natural quiet	1	2	3	4	5	1	2	3	4
To do something with my family	1	2	3	4	5	1	2	3	4
To be with members of my group	1	2	3	4	5	1	2	3	4
To be with people who enjoy same things I do	1	2	3	4	5	1	2	3	4
To meet new people	1	2	3	4	5	1	2	3	4
To participate in recreational activities	1	2	3	4	5	1	2	3	4
To learn about the cultural history of the area	1	2	3	4	5	1	2	3	4
To learn about the natural history of the area	1	2	3	4	5	1	2	3	4
To participate in ranger-led activities	1	2	3	4	5	1	2	3	4
To experience new and different things	1	2	3	4	5	1	2	3	4
To test my skills and abilities	1	2	3	4	5	1	2	3	4
To stargaze	1	2	3	4	5	1	2	3	4
To enjoy the scenery of Lake Powell	1	2	3	4	5	1	2	3	4
To think about my personal values	1	2	3	4	5	1	2	3	4
To be close to nature	1	2	3	4	5	1	2	3	4
To challenge myself	1	2	3	4	5	1	2	3	4
To be creative by doing something such as sketching, painting, taking photographs	1	2	3	4	5	1	2	3	4
To get exercise	1	2	3	4	5	1	2	3	4
To be away from other people	1	2	3	4	5	1	2	3	4
To relax physically	1	2	3	4	5	1	2	3	4
To experience solitude	1	2	3	4	5	1	2	3	4
To get away from the usual demands of life	1	2	3	4	5	1	2	3	4
To have thrills and excitement	1	2	3	4	5	1	2	3	4
To share my skill and knowledge with others	1	2	3	4	5	1	2	3	4
To feel healthier	1	2	3	4	5	1	2	3	4

Other (specify): _____

About your Watercraft Use

3. During your most recent visit to Glen Canyon National Recreation Area, what was your primary method of travel while on the water? (*check one*)

- | | |
|---|------------------------------------|
| <input type="checkbox"/> Houseboat | <input type="checkbox"/> Powerboat |
| <input type="checkbox"/> Personal watercraft | <input type="checkbox"/> Sailboat |
| <input type="checkbox"/> Canoe | <input type="checkbox"/> Kayak |
| <input type="checkbox"/> Other (describe) _____ | |

4. Did you own or rent the watercraft you used for your primary method of travel? (*check one*)

- Own
- Co-own/multiple owner
- Rent from local company in town
- Rent houseboat from concessionaire
- Rent powerboat from concessionaire
- Other (specify): _____

5. Have you ever taken a class in personal watercraft operation and safety?

- Yes
- No

6. On your most recent trip to the Glen Canyon National Recreation Area:

a. did you operate a personal watercraft?

- No (**if no GO TO QUESTION 7**)
- Yes

b. did you use:

- your own personal watercraft
- a friend's personal watercraft
- a rental personal watercraft
 - from town
 - from concessionaire

c. What method did you use for refueling your personal watercraft? (*check all that apply*)

- did not refuel personal watercraft
- brought own fuel from home
- purchased fuel in the area
 - gas dock
 - gas station
 - gas can on the water
 - gas can on shore

e. As a personal watercraft user how did you dispose of human waste while on the water? (*check all that apply*)

- Use a marine toilet aboard a support vessel
- Use facilities provided at landings
- Use floating restrooms provided on Lake Powell
- Carry a portable toilet
- Other method of waste disposal, please specify _____

Situations Experienced In The Area

7. This question concerns possible situations you may have experienced while visiting Glen Canyon National Recreation Area. Please evaluate each situation below. (Circle one number that best describes how much of a problem, if any, you found each to be)

<i>Situation</i>	No Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem	Don't Know
Finding an unoccupied campsite	1	2	3	4	5	6
Finding beach campsite	1	2	3	4	5	6
Litter on beaches and shoreline	1	2	3	4	5	6
Poor water quality	1	2	3	4	5	6
Sufficient navigational aids on Lake Powell	1	2	3	4	5	6
People being inconsiderate	1	2	3	4	5	6
Too many motorized boats on the lake	1	2	3	4	5	6
Too many personal watercraft on the lake	1	2	3	4	5	6
Too many commercial tour boats	1	2	3	4	5	6
Unsafe operation of motorized boats	1	2	3	4	5	6
Unsafe operation of personal watercraft	1	2	3	4	5	6
Boats closer to my boat than I like	1	2	3	4	5	6
Too much noise on the lake	1	2	3	4	5	6
Conflicts with others for beach space	1	2	3	4	5	6
Conflicts with personal watercraft operators on lake	1	2	3	4	5	6
Evidence of pets and their droppings	1	2	3	4	5	6
Adequate toilet facilities at landings	1	2	3	4	5	6
Adequate floating toilet facilities on lake	1	2	3	4	5	6
Human waste on lake shore or in water	1	2	3	4	5	6
Confusion about rules and regulations	1	2	3	4	5	6
Too much light on the lake at night	1	2	3	4	5	6
Too much light at the marinas at night	1	2	3	4	5	6
Evidence of livestock	1	2	3	4	5	6
Evidence of mining operations	1	2	3	4	5	6
Lack of National Park Service presence on the lake	1	2	3	4	5	6
Enough ranger-led activities	1	2	3	4	5	6
Noise from airplanes	1	2	3	4	5	6
Other things (please specify) _____						

8. We would like to know how you felt about seeing different numbers of watercraft at various locations during your most recent visit to Glen Canyon. Complete columns A and B for each location you visited in Glen Canyon. If you don't recall how you felt, circle "0" in column A. If you did not visit the location, circle "no" in the second column, and go to the next location.

LOCATION	Did you visit the location? <i>(circle one)</i>	COLUMN A								COLUMN B
		In general, how acceptable was the number of watercraft you saw?								If you circled 1, 2, or 3 in Column A, what made you feel this way?
		Very Unacceptable			Very Acceptable			don't recall		
On the lake surface	yes no <i>(go to next location)</i>	1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):
On the lake shore	yes no <i>(go to next location)</i>	1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):
At boat landings	yes no <i>(go to next location)</i>	1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):
While at campsite	yes no <i>(go to next location)</i>	1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):
At fueling docks	yes no <i>(go to next location)</i>	1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):
Other (specify):		1	2	3	4	5	6	7	0	____ number of watercraft ____ type of watercraft ____ something else (specify):

9. Did you observe any unsafe boating practices on your most recent visit to Glen Canyon National Recreation Area?

___ No

___ Yes, please briefly describe the unsafe activity and where it occurred:

10. Did you feel safe on your most recent visit to Glen Canyon National Recreation Area?

___ Yes

___ No, please briefly describe why and where you felt a concern for your safety:

Management Actions

11. Given the conditions in the Glen Canyon National Recreation Area, to what extent do you 'oppose' or 'support' each of the following possible management actions? (*Circle one number for each action*)

Management Actions	Strongly Oppose	Oppose	Neither oppose nor support	Support	Strongly Support
Zone the waters to provide specific uses at specific places	1	2	3	4	5
Establish "off-limit" zones to protect sensitive resources	1	2	3	4	5
Restrict personal watercraft use to designated areas only	1	2	3	4	5
Limit number of boats allowed on lake	1	2	3	4	5
Limit number of motorized watercraft allowed on lake at any one time	1	2	3	4	5
Limit number of non-motorized watercraft allowed on lake at any one time	1	2	3	4	5
Limit number of personal watercraft allowed on lake at any one time	1	2	3	4	5
Limit number of houseboats allowed on lake at any one time	1	2	3	4	5
Restrict number of people using lake at any one time	1	2	3	4	5
Limit number of people <i>per group</i> allowed on lake	1	2	3	4	5
Improve public access to the lake	1	2	3	4	5
Expand the number of marina slips	1	2	3	4	5
Restrict further facility development and expansion	1	2	3	4	5
Provide more information to visitors about appropriate behavior	1	2	3	4	5
Provide more park rangers on the lake to educate visitors about appropriate behavior	1	2	3	4	5
Require visitors to learn about appropriate behavior on the lake (e.g., watch a short video presentation)	1	2	3	4	5
Aggressively enforce safety rules and regulations on lake	1	2	3	4	5
Provide visitors with natural history information about the area	1	2	3	4	5
Prohibit non-motorized watercraft on the lake	1	2	3	4	5
Prohibit motorized watercraft on the lake	1	2	3	4	5
Prohibit personal watercraft on the lake	1	2	3	4	5
Use management controls to prevent conflicts between lake users	1	2	3	4	5
Use management controls to prevent damage to the environment by visitors	1	2	3	4	5
Prohibit drinking alcoholic beverages on the lake	1	2	3	4	5
Provide more toilet facilities at landings	1	2	3	4	5
Close area to pets	1	2	3	4	5
Other things (please specify): _____					

Service Quality and Visitor Satisfaction

12. How satisfied were you with the quality of the services provided for you at Glen Canyon National Recreation Area? (*circle one number for each item*)

Service Quality	Dissatisfied	Somewhat Dissatisfied	Neither Dissatisfied nor satisfied	Somewhat Satisfied	Satisfied	Did not Use/Don't know
Visitor information	1	2	3	4	5	6
Exhibits and other educational materials	1	2	3	4	5	6
Concessionaire food service	1	2	3	4	5	6
Concessionaire lodging	1	2	3	4	5	6
Concessionaire retail stores	1	2	3	4	5	6
Facilities within the area	1	2	3	4	5	6
Park ranger-led activities	1	2	3	4	5	6
National Park Service employee assistance	1	2	3	4	5	6
Concessionaire assistance	1	2	3	4	5	6
Overall quality of services	1	2	3	4	5	6

13. Are there activities or services you think should be offered at Glen Canyon National Recreation Area that currently are not offered (*please describe*)?

Feelings About your Most Recent Visit to Glen Canyon National Recreation Area

14. To what extent do you 'disagree' or 'agree' with the following statements about your most recent trip to Glen Canyon National Recreation Area? (*circle one number for each statement*)

Feelings about trip	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
I enjoyed my time on Lake Powell	1	2	3	4	5
I did not have the kind of experience I was looking for	1	2	3	4	5
I avoided parts of the lake because there were too many boats there	1	2	3	4	5
I enjoyed the natural quiet	1	2	3	4	5
I enjoyed the interpretive programs	1	2	3	4	5
I thought the area and its surroundings were in good condition	1	2	3	4	5
My camping experience was improved by the quality of the night sky	1	2	3	4	5
The presence of personal watercraft interfered with the quality of my boating experience	1	2	3	4	5
The trip was not worth the money it cost	1	2	3	4	5
The lighting at the marinas positively affected my visit	1	2	3	4	5
I stayed off the lake during parts of the day because there were too many boats on the lake	1	2	3	4	5
Overall, I was satisfied with my most recent trip to Glen Canyon	1	2	3	4	5

About You

15. What is your gender? Female Male

16. What is your age? _____ years

17. What is the highest level of education you have completed? (check one)

- 8th grade or less
- Some high school
- High school graduate or GED
- Some college, business or trade school
- College graduate
- Some graduate school
- Masters, doctoral or professional degree

18. What was your total household income (before taxes) last year?

- Less than \$15,000
- \$15,000 to \$24,999
- \$25,000 to \$39,999
- \$40,000 to \$64,999
- \$65,000 or more

19. In what ethnicity and race would you place yourself?

Ethnicity Hispanic or Latino
 Not Hispanic or Latino

Race American Indian or Alaska Native
 Asian
 Black or African American
 Native Hawaiian or other Pacific Islander
 White

20. Any other comments about your visit to Glen Canyon National Recreation Area or suggestions about managing the area are welcomed. Please use the space below to write your comments.

Thank you for your help!

Please return this questionnaire using the prepaid, self-addressed envelope provided

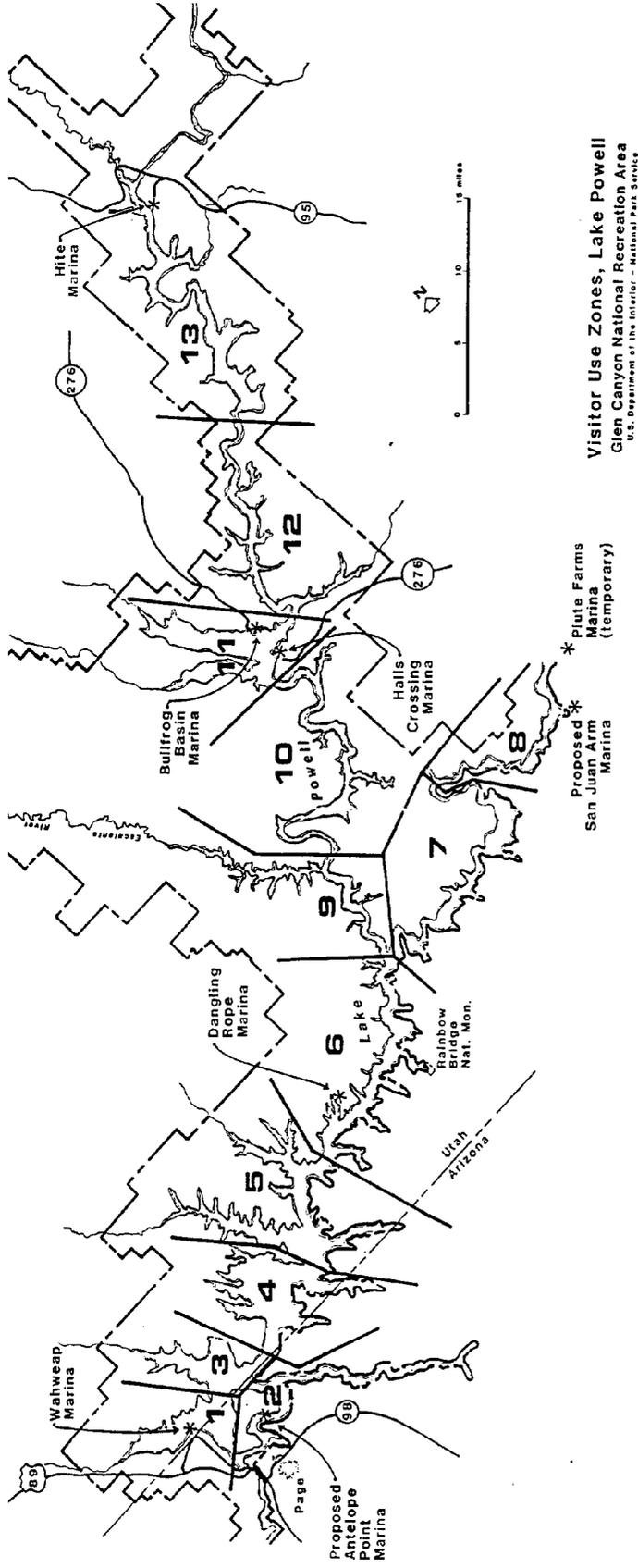
If you want more information about this study, contact the University of Minnesota Cooperative Park Studies Program, 115 Green Hall, 1530 Cleveland Avenue North, St. Paul, MN 55108-1027, 612-624-3699.

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by the National Park Service to improve resource management and planning and better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. The information you provide will be anonymous. Please do not put your name or that of any member of your group on the questionnaire. Data collected through visitor surveys may be disclosed to the Department of Justice when relevant to litigation, or to appropriate Federal, State, local or foreign agencies responsible for investigating or prosecuting a violation of law. Public reporting burden for this form is estimated to average 20 minutes per respondent. Direct comments regarding the burden estimate or any other aspect of this form to the Office of Information and Regulatory Affairs of OMB, Attention Desk Officer for the Interior Department, Paperwork Reduction Project 1024-0224 (NPS99-024), and to the Information Collection Clearance Officer, WASO APC, Accountability and Audits Team, National Park Service, 1849 C Street, N.W., Washington, D.C. 20240. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Appendix D

Glen Canyon Zones

Glen Canyon Zones



- Zone 1:** Wahweap Bay, Wahweap Marina, Lone Rock.
- Zone 2:** Glen Canyon Dam, Carl Hayden Visitor Center, Antelope Island.
- Zone 3:** Crosby Canyon, Warm Creek Bay, Castle Rock.
- Zone 4:** Padre Bay, Gunsight Butte, Crossing of the Fathers.
- Zone 5:** Last Chance Bay, Rock Creek Bay, Gregory Butte.
- Zone 6:** Dangling Rope Marina, Rainbow Bridge, Cathedral Canyon.
- Zone 7:** San Juan Arm, Bald Rock Canyon, Piute Canyon.
- Zone 8:** Nokai Canyon, Copper Canyon, Old Piute Farms Marina.
- Zone 9:** Cottonwood Canyon, Hole-in-the-Rock, Escalante River.
- Zone 10:** The Rimcon, Iceberg Canyon, Slick Rock Canyon.
- Zone 11:** Bullfrog Marina, Halls Crossing Marina, Stanton Creek.
- Zone 12:** Defiance House Ruin, Forgotten Canyon, Knowles Canyon.
- Zone 13:** Hite Marina, Farley Canyon, Dirty Devil River, Colorado River.

Appendix E

Fall Sampling Plan

Fall Sampling Plan

1999 Fall Sampling Plan

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
				10/15	10/16	10/17
10/18 Wahweap Area	10/19 Wahweap Area	10/20	10/21	10/22 Wahweap Area	10/23 Wahweap Area	10/24 Wahweap Area
10/25 Travel to Bullfrog	10/26 Bullfrog Area	10/27	10/28 Halls Area	10/29 Halls Area	10/30 Halls Area	10/31 Bullfrog Area
11/01	11/02 Bullfrog Area	11/03	11/04 Bullfrog Area	11/05 Hite Area	11/06 Hite Area	11/07 Hite Area
11/08	11/09 Wahweap Area	11/10 Wahweap Area	11/11 Wahweap Area	11/12 Wahweap Area	11/13 Wahweap Area	11/14 Wahweap Area
11/15						

Appendix F

Cover Letter Included With Mail-Back Survey

October, 1999

Dear Glen Canyon National Recreation Area Visitor,

We need your help! National Park Service managers are currently gathering data about types of use at Glen Canyon National Recreation Area. What they learn from this data will be used to better provide for your needs. During your visit to Glen Canyon this spring you agreed to participate in a survey. Your opinions, as a visitor, will provide park managers with valuable information that will improve resource management and visitor services at Glen Canyon National Recreation Area.

Enclosed is the questionnaire we said we'd send you soon after your visit. Please complete and return this questionnaire in the pre-paid, self-addressed envelope provided as soon as possible.

Your participation is important and it will take less than 15 minutes of your time to fill out the questionnaire. This is your opportunity to offer your opinions and comments about your experience at Glen Canyon National Recreation Area and how the area should be managed. Of course, this survey is *voluntary and your confidentiality will be maintained*.

If you have any questions about the questionnaire, please feel free to contact us at the address shown on the letterhead, by phone, or by email.

Thank you for your help!

Sincerely,

Dorothy H. Anderson Ph.D.
Professor
(612) 624-2721
danderso@forestry.umn.edu

E. B. James
Research Assistant
(612) 624-4280
jame0136@tc.umn.edu

November, 1999

Dear Glen Canyon National Recreation Area Visitor,

Two weeks ago you received a questionnaire from the University of Minnesota asking you to offer your opinions and comments concerning your experiences in and opinions about Glen Canyon National Recreation Area.

So far we have not received your completed questionnaire. Because we've contacted a small number of visitors for this study, we need to receive as many completed questionnaires as possible. Your input is extremely important. In the event that you did not receive the first questionnaire or no longer have it, another questionnaire is enclosed. Please complete and mail this questionnaire at your earliest convenience. It will not take more than 15 minutes of your time.

This is an opportunity for you to offer your opinions and comments about resource management and visitor services the Recreation Area. Of course, this survey is *voluntary and your confidentiality will be maintained*.

We know the holiday season is a busy time for everyone. We really appreciate you taking time out of your busy schedule to respond to this questionnaire.

If you have any questions, please feel free to contact me at the address shown on the letterhead or by phone.

Thank you for your help!

Sincerely,

Dorothy H. Anderson Ph.D.
Professor
(612) 624-2721
danderso@forestry.umn.edu

E. B. James
Research Assistant
(612) 624-4280
jame0136@tc.umn.edu

November, 1999

Dear Glen Canyon National Recreation Area Visitor,

Two weeks ago you received a second questionnaire from the University of Minnesota asking you to offer your opinions and comments concerning your experiences in and opinions about Glen Canyon National Recreation Area.

We still have not received your completed questionnaire. Because we've contacted a small number of visitors for this study, we need to receive as many completed questionnaires as possible. Your input is extremely important. In the event that you no longer have a questionnaire, another is enclosed. Please complete and mail this questionnaire at your earliest convenience. It will not take more than 15 minutes of your time.

This is an opportunity for you to offer your opinions and comments about resource management and visitor services the Recreation Area. Of course, this survey is *voluntary and your confidentiality will be maintained*.

We really appreciate you taking time out of your busy schedule to respond to this questionnaire.

If you have any questions, please feel free to contact me at the address shown on the letterhead or by phone.

Thank you for your help!

Sincerely,

Dorothy H. Anderson Ph.D.
Professor
(612) 624-2721
danderso@forestry.umn.edu

E. B. James
Research Assistant
(612) 624-4280
jame0136@tc.umn.edu

Appendix G

Other Open-Ended Responses to the Mail-Back Survey; Questions Concerning Activities, Experiences, Situations, Unsafe Behavior, Feeling Safe, Management Actions, and Suggested Activities and Services

Open-Ended Responses to the Mail-Back Survey; Questions Concerning Activities, Experiences, Situations, Unsafe Behavior, Feeling Safe, Management Actions, and Suggested Activities and Services

Other activities respondents participated in (question 1):

Sightseeing

Tour boat sightseeing

Relaxing! Enjoy the peaceful surroundings.

Rest and relaxation.

Lots of nude sunbathing.

Relax.

Searching for fossils.

Girl watching.

Relaxing.

Astronomy, stargazing.

SCUBA

Dam tour.

Resting

Rock hunting

Water skiing.

Other experiences respondents reported (question 2):

"To feel safe" while in proximity to others, i.e. in boats, very important- usually not attained.

Other situations respondents reported (question 7):

Farley Canyon outhouse stink (very serious problem).

Keep in mind this is November. I would answer differently for different months. Livestock on the way to Powell problem at times. Every time I'm in restroom I see a place where there once was plastic bags for trash but they are always empty all four times this year! Didn't see human waste but always see mice everywhere! Never see NPS rangers but at the dock.

Floating toilet and waste facilities needed in the upper part of the lake. Specifically the Good Hope, Red Canyon area.

Restrooms were broke/ couldn't use.

Operators are often inexperienced and unknowledgeable about boating safety/operation. They are a danger to others and themselves. The large houseboats can be quite a threat at the marinas.

Rental powerboats.

Inexperienced captains.

Tour boats pushing too large wakes.

Wake from large tour boats: Beat up beached kayaks and more importantly causing serious bank erosion which means more silt to settle out.

The lake gets choppy when tour boats operate- Huge waves!

Tour boat wake.

Lack of campsites designated for non-motorized watercraft.

Gas price.

Gas prices are much too high= 2.18 per gallon versus 1.29 at gas stations.

Animals on the marina- and often their droppings.

Loose pets a very serious problem.

Need to mark shallow rocks.

Unsafe boating practices witnessed by respondents (question 9):

Boating to close to my boat while fishing. Making big wakes.

Underage children and careless adults using a PWC.

Boaters going too fast in no-wake zones.

Uneducated houseboat renter operator at Dangling Rope marina. Could not control/maneuver the houseboat. Hit dock sideways and almost damaged a private boat. Required ranger assistance to clear the area.

Buoy markers were being ignored by some.

Cruiser cut across our houseboat bow closer than should be.

Houseboat renters do not know the rules of the road on the water.

Operators of motorized watercraft approaching too close, not aware of impact of their wakes. Extreme high speed operation in confined waters. Not keeping adequate look out, failure to grant right of way.

Boats coming and going full speed in narrow canyons: especially Antelope.

Boat driving on wrong side of water passage, we had to steer down for it.

Bass boats very inconsiderate.

Boats going too fast near marina perimeter- also smaller boats cutting across bow in a close proximity.

Boats operating at night without lights.

Bigger boats not giving right of way to smaller boats.

Speed in proximity- very serious problem when lake is crowded.

Three houseboats full of young (college age) people swerving back and forth in main lake channel south of Hall's crossing. Was forced to turn to avoid collision when a boat traveling parallel in the same direction suddenly turned 90 degrees directly into my path.

Boat driver pulling water skier driving unsafely toward our boat and water skier in Hanson creek.

Seems the majority of all boats, especially big boats come too close for safety while your fishing or floating still.

Marinas- not operating below wake. Crowding and cutting other boaters off.

Boats coming too close to my anchored houseboat making larger wake than they should be.

Boats going too fast and too close to other boats.

On the docks people can get tangled in ropes.

Too close for speed. Little kids on wave cutters even in the marinas. Everywhere on lake lots of drinking and driving.

Above wakeless speed through buoy field at Halls.

Boats approaching too close from behind, and our houseboat taking rolling waves broadside.

Just the bass boats speeding away from the docks.

Not reducing speed by approaching boats.

All over the lake people grossly violate the rule about passing another boat at a distance greater than 150 feet. During a typical trip I will have 10 to 20 boats pass my houseboat within 50 feet, let alone 150 feet! Often they are at maximum wake making speed and literally throw items off shelves etc. when the wake hits us broadside.

Bow riding, no life jackets on children.

Gunsight Canyon, near far end. My boat was tied to shore for overnight camping. Approximately two hours after dark a fast runabout with a strong spotlight came up canyon at high speed, passed within 50 feet of my boat at approximately 25 miles per hour.

Large (30 foot) boat doing donuts just outside breakwater at Wahweap.

Riding moving boat in marina on swim platform right above out drive.

Speed in wakeless area.

High speed in canyons.

Warm creek boats going too fast in a narrow canyon and too close to other watercraft.

Boats in wakeless going at wake speed, boats passing too close, boats doing water sports too close to shore camped boats (within the 150 foot limit).

Verbatim responses to "did you feel safe on your most recent visit to Glen Canyon National Recreation Area?"

Yes, we have an experienced captain from Mexico.

I must be constantly aware of motorized watercraft. The skills, attitudes, and alertness of operators are totally unpredictable.

Boaters tend to drive too fast in the narrow side . We were concerned boaters coming around curves in side canyons wouldn't see us (this is an issue at high speed).

Stupid boat operators. Passing too close is only one of the problems.

Other management actions suggested by respondents:

Pets at dock slips (droppings)

Not allowing pets on dock.

More garbage facilities and bags available.

Provide more floating toilets and dump stations.

Keep docks straight: Make loading and unloading boats easier by making the docks straight! We were at Bullfrog to get to exec services we went straight 50 feet then out the bridge 100 feet from store on ramp over 50 yards then we were on Execs dock, where we could have had a straight shot to go from the parking lot to the exec services dock- a pain to unload everything and garbage.

Need light at boat ramp, mainly at Hite.

As the lake population increases more parking spaces need to be available. There should not be loading and unloading of houseboats at public marinas. They need their own marina.

The entrance to Rainbow Bridge should be posted No Wake Zone- 5 miles per hour.

More no wake zones- perhaps side canyons.

Place buoy anchorage in canyons where shore campsites are limited (biggest single improvement!). Get rid of cattle grazing in winter- dangerous for motorists.

Put no wake buoys in busy canyons, i.e. Gunsight, Navajo, Antelope.

Require rental boat operators to learn appropriate behavior before going out on the lake via the video program or something.

Rental and first timers, inexperienced visitors need education.

Verbatim suggestions by respondents about activities and services that should be offered at Glen Canyon:

Year round Park Service employees on the lake- not just on holidays.

Outboard oil at fuel dock needed. Upgrade restrooms at Wahweap store.

Public ranger stations that can easily take comments, not boxes. This should include law enforcement too.

Rock art information and special tours.

Better weather reports/forecasts!

Marina on the San Juan arm to make it accessible.

More access for people who don't have boats.

More 4-wheel drive trails (jeep trails).

Shuttle boat service for non-motorized watercraft users.

Our son wants a McDonalds barge to travel the lake like an ice-cream truck travels neighborhood!!

I feel the services are quite good, but the prices are double the usual- especially gasoline at 2.09 per gallon- this is a "rip-off."

Allow for private tour/boating as a commercial business- ARA has a monopoly.

No wake zones in good fishing areas.

The concessionaire needs competition.

Sailboat instruction.

Guided trips to ruins, but I realize that is not possible.

More shows and grocery availability, outfitting supplier.

Where's the Taco Bell?

Possible video on history, ecology, etc. of lake.

There is a general lack of competition so that amount and quality of service is not as good as it could be.

SCUBA tanks refilled at pro-shop. Ice cream vendor used to be at Bullfrog but is gone. We miss ice cream.

Boat ramp rangers during busy times.

Natural/cultural history tours and presentations.

Laundry mat at Hite.

More rental trailers are needed at Hite. Debris clearing to provide more lake front campsites. Store could remain open longer. There should be lighting at the launch site!

New facilities at Hite but no showers.

Power in all developed campgrounds.

Shower near Hite marina.

There is a huge need for control of driftwood and similar hazards to navigation on the north end of the lake. Most could be controlled by even half way intelligent use of a log boom that could be opened when the wind is from the south and closed when the wind dies down. These are used in Canada and timber on any areas very effectively.

We were there at the off season and did not see a Park Service employee or ranger in two days.

Additional safety patrol/towing services for any who have mechanical or health/accident problems.

Install more navigational aids closer together.

Better cell phone coverage for emergency purposes.

Improved roads on waters edge.

More rangers, more navigational aids and markers i.e. under surface.

Kayak shuttle on lake.

Improvement of dock and boat slips, showers, restrooms etcetera.

Arizona concession services should open before eight AM during summer months.

Hot showers.

More boat races.

Optional boater education for non-experienced boater. Posting at marina stores boater education courses for adults and children.

Ice service at Stateline.

Appendix H

Open Ended Responses to Question 20 of the Mail-Back Survey

Open Ended Responses to Question 20 of the Mail-Back Survey

Provide more toilets on lake and more toilets at well used campsites- E. Coli a big problem when lake is high.

Set guidelines as to quiet time while boat camping. Too much loud music, fireworks, etc.

My intent was to rent a boat, but because of the very convoluted and large size of the lake I was fearful that without a GPS I would become lost.

Allow all users to use the surroundings that God created, He will take them back in His time.

We visited the lake during the off season for this trip. Answers to many of these questions would be different had we answered them the previous year when we visited in July.

I wish the park was open 24 hours. Sometimes you want to get to a fishing area that does not open until 8AM (gates). That's too late! Everyone cannot afford boats and sometimes shorelines are closed by gates.

Enjoy boating and fishing, camping at beach twice this year.

We have visited Lake Powell 16 times in the last 11 years and have seen the obvious growth at all ends of the lake. It would be nice to stop the growth but to be restrictive on the recreational activities we come to do would be difficult to adjust to.

I only visit Lake Powell in the "off" season so crowding is not a problem as I hear it is in the summer. As a seas kayaker I enjoy the beautiful scenery. The houseboat vendors enjoy a large profit opportunity. How much do they contribute to the lake maintenance?

My overall observation is that motorized watercraft operators have a complete lack of knowledge of the rules of the road. I'm a U.S.C.G. veteran and experienced sail boat handler/navigator. Bass boats traveling at 70+ miles per hour with helmet wearing operators is ridiculous. More rangers, more patrols, Aggressively enforce the law! Between Memorial Day and Labor Day the lake is unusable due to crowding. Ranger patrols are not adequate. Additional floating sanitary facilities would be helpful. Disposal facilities for human waste that is packed out like back packers pack it out are needed.

Please find a way to get people to realize that they are not the only people at the lake. In other words be more considerate of others. At the time of our visit, there was no visitor pressure (off season).

We received most information from Chamber of Commerce and she was very helpful. The tour boat was hard to see out of window inside.

The lake is perfect, leave it alone and let us enjoy it!

Just leave people to be by themselves.

If the Park Service would ever want to limit the number of boats on the lake, they should start with the government authorized monopoly first- Aramark rental boats. I feel the interests of the tax paying public should come before the rights of a profiting corporation on renting lake space on their boats. There is a conflict of interest between Park Service and Aramark- for the Park Service receives a portion of Aramark income. I feel the concessions should be broke up into smaller units in order to allow more companies the opportunity to compete and therefore give better service to the public. The Park Service should not directly benefit from the concessions. All income should go into the general fund- this would eliminate the conflict of interest.

Prohibiting alcohol would limit the number of people on the lake, improve the littering situation, improve unsafe boating, and solve many serious problems. It is too bad this would not be a popular enough decision to pass.

I travel to Lake Powell in the off season to prevent/avoid situations. Do not drain the lake. Try to keep the flows out of the dam regulated instead of erratic. I enjoy the lake and the river- different times of the year.

The time of year was perfect, weather and water temperature and hardly any traffic.

We use the lake for skiing, boating, hiking, camping quite often. In 10 years of usage have seen a lot, good and bad. We plan visits to avoid crowds and bad weather. We try hard to clean up after ourselves and others and hope the hoodlums don't take over.

More boater education, competition for concessionaire, less Park Service, more private business.

We always go to Escalante arm.

Don't drain the lake!

I would like to see a regulation on alcohol and operating watercraft enforced. Try to keep the loading docks clear of people just sitting there. Large fines for those operating watercraft unsafely. Do not drain the lake!!!

Entrance and campsite fees are high. Stop increasing these fees. The Park Service could be much more efficient. Last May, when there were few visitors, as we were leaving the campground at Bullfrog we counted 17 Park Service vehicles between the campground and the entrance station.

On a prior trip to Powell, at Halls marina public campground, the restrooms were not maintained. I wish the park rangers would monitor the concessionaires responsibility in this area.

I was at Glen Canyon late in the year (October 24,25,26), at other times my answers would have been different.

We love Lake Powell- improvements are great. The only people leaving junk and crap around are the environmentalists!

Please don't restrict access or drain the lake!!!

We arrived late. We were hungry (very hungry). We were in the restaurant 10 minutes before closing. We waited to be seated ten minutes before someone finally showed up. Then they said they were closed and accused us of opening the restaurant door which they claimed they had closed. This is the utmost in poor service. If they don't want to work, then take away their contract!

I enjoyed my first visit to Lake Powell, however, having read extensively about the area, my personal feelings and long term wish would be to have the area returned to the area's natural state, meaning, to take the dam away and let the river run its wild course. I personally feel that what was done to this area was tragic and such a loss to the natural wilderness and the environment.

October is a great time to visit. Most PWC's will not come out because of the cooler weather. More lights at the launch ramps would be a plus for after dark launches.

Summer can be hectic but training is better than letting a few ruin the pleasure of the majority. Excellent group, both NPS and Aramark. Super area. Help educate the few that cause problems.

What a great place to take my family! Thanks for the opportunity to improve Lake Powell!

The park is wonderful- the presence of the dam/water makes for a majestic location. It is a wonderful place to go to participate in water sports. Many people enjoy many different kinds of activities such as skiing, boating, camping, hiking, etc. I don't think it fair to control the types of activities allowed just because those managing the site have more "naturist" interests. Not all can be involved in park management, the taxes pay for it must come from somewhere- the rest of us.

I enjoyed the trip enormously. I am concerned that some people are encouraging draining the lake. Dumbest idea these wackos have ever had!

I love to see and hear the jets, small navy or army jets fly up the canyons- you know the ones like the Blue Angels fly. They are so neat! We really enjoyed our visit to the dam. This is the first time I've been there. The 31st of October we went on the tour. The guide was great. He really loved his job.

Pave Burr Trail.

I love to fish in clean warm water and you have it. Thanks.

I like it that you protect the outside environment from usage damage. It is my families get-away (favorite). We live in Colorado and find the trip and stay worth it. If you're going to change anything in the future, don't change much! Thank you.

The trash on shorelines and camp areas along with fact there doesn't seem to be enough organized effort to police up area is a real problem. ARA needs to double the trash trackers and (?) efforts along with modeling and enforcement by Park Service.

A very delightful week.

More in-depth surveys are needed- month specific hopefully- because while we last were here in late October/November and were the only ones fueling up. We have waited hours before. Try and keep a 65 foot in one position for that long. Small boats turning waves. Loading at dock was hard with so many on (?) 1 days too! Post what you learn on web site please keep us informed.

To base my opinions on my most recent trip is not a true representation of an experience at this lake. To be there when there is almost no other activity is a wonderful treat. On other trips- noise, finding an un-crowded beach campsite and too much boat traffic were problems. I just wish people would have more respect for this beautiful place. Maybe the only way is to restrict use, but that is not fair to people who do take care and are not trashing the lake and shorelines.

We were there in November and I realize this is the off season, therefore we probably had a more enjoyable time due to fewer visitors.

Rangers need to be in side canyons more. Get animals off lake area. Don't sell alcohol.

If lake reg's are more strictly enforced it will help. I have been on the lake many times on and off-season. I have not been impressed by the presence of rangers on or patrolling the lake. I have only seen them twice in the last six years.

Need mechanism to regulate Aramark- not sure who to complain to... they are doing sub-par service.

I cannot believe or understand why livestock is allowed anywhere near this area. I camped at the Rincon and there was cowshit everywhere! I was very disappointed! Especially since we were required to keep our shit off the shore. Livestock have no place in any National Recreation areas, especially lakes!!

The three summer months are a lot different than the other eight/nine months. You need to open additional campsites, i.e. buoy anchorage to help add more campsites.

I have boated, fished, camped, hiked, and just enjoyed the tremendous beauty of Lake Powell for over 30 years. There are not many places on the lake I have not visited at one time or another. I have many years of experience as a recreational boater as well as a professional bass fisherman on Lake Powell and I would be more than willing to help in any way that would help this wonderful area. The National Park Service does a terrific job- Lake Powell is a wonder to all who see it!!!

There was a group of five men going out of Bullfrog marina the first weekend of November. We had the lake practically to ourselves. It was wonderful! Fishing is our sport, and we have been coming here twice a year for over ten years. We love the lake and the country around it. Please see if you can do something about bringing the striper bass population and size back up again. Can I help?

Phone service too expensive. Nine minute call cost 24 dollars. I go to Lake Powell in November and April to fish for stripers. I purposefully do not go in summer or national holidays to avoid great numbers of people and the problems associated with them. I believe in freedom. Allow people to use the lake in any manner, provided its safe and others have the same opportunity. Recreation at Lake Powell is for the wealthy. Our group of five men for three days on the lake in a private powerboat was 120 dollars each for gas down and back and camp fees. We brought most of our own food. We drove an RV with boat and trailer from Provo, Utah.

I think Lake Powell is a beautiful place. I love to visit.

Gasoline and houseboat rentals are way too expensive as are slip rentals.

At Hite marina I am concerned the un-used buoys are floating everywhere-very dangerous- especially at dusk. All the buoys should be painted a color you can see.

At night if you come in after dark you cannot identify the launch dock- it's dangerous to say the least. I have fished Lake Powell for 20 years, and haven't had a bad trip. Love it down there!

Dogs need to be much stricter controlled. The leash law is non-existent. (0 percent of dog owners don't care where their dog or dogs do their business, next to you, next to the camper, next to the water, just about anywhere the dog wants to go.

Please give this idea strong support. Lake Powell needs this idea for many generations to come! Release all large mouth bass during spawn!

Thanks for keeping Lake Powell a natural playground. Avoid getting too "police hungry." Posters and education really help in the long run. Hope that a few "bad apples" don't ruin it for all of us who enjoy and protect a wonderful environment and recreation area. Thanks again.

I have visited the lake during the busy summer time when I do feel there were too many boats, but I would not put any restrictions on numbers. Also I do feel there needs to be more education on behavior while on the lake. I have never left Lake Powell with a negative experience.

Year round fish cleaning facilities should be provided. This does not pertain to this visit, but the fishing dock at Wahweap is a tremendous idea. Please consider this for other marinas at the lake.

Drain the lake and scrub the walls. What planet are you from!! The first of November is a very poor time for a survey, especially at Hite, there are not very many people and this is the best time in my opinion to visit the lake.

Showers near Hite marina. More areas of public access to the water to reduce congestion.

More Park Service presence. Work on litter control and preservation of shoreline.

Mr. ____ and his wife were very helpful. We will return!

My visit was during the first two weeks of November. I'm sure many of my answers would be very different if the visit were during July or August. Visited the "Dangling Rope" marina. It was a pleasant experience. Very friendly and helpful people. Was pleased at the stock of items in the store.

No wake buoys in bus canyons. Do this survey during June July and August. I know my answers would not be the same on a lot of questions. I have seen the mayhem! Could use some more floating restrooms.

The lake is large enough to accommodate all visitors at this time, especially during the off season. I would appreciate more safety patrols to the more remote areas during the off-season times.

First time I've been to the area in the non-summer months. Except for water temperature (hence, no swimming or skiing) it was fantastic! No boats, no people, no noise. I plan to make this a regular fall trip.

We only used the lake during winter, fall and spring (end of October to end of April). Winter days only. This is why there is a lack of boats on the lake.

I am retired and live in Page Arizona. For 15 years I go to the lake nearly every day. We (my wife and I) walk for exercise and enjoy the scenery and the weather (normally quite good). Although I am not affected I resent the start up charging admission. This park belongs to the people. Why should they pay to visit that which belongs to them?

It was great!

Don't mess with the area. Help us keep it clean. Enforce laws on boating, wave runners, low flying aircraft, and people who trash the shoreline. Do not let tree huggers or anyone else mess with my lake. Everyone should be able to use the lake.

We visit only during off-season because of lack of crowds (equating to rude, noisy people). I would like to see no changes (except Rainbow Bridge) during the off-season. Summer is a bummer on Lake Powell.

The facility improvements over the past two years have been worth the additional fees.

My husband and I live outside of Page and moved here for the purpose of enjoying the lake, which we do! We do avoid certain times of the year (holidays) when the marinas are so busy. But we definitely enjoy this beautiful area and spend many wonderful days on the lake when tourists have left and the quiet is heavenly.

I have written three letters (3 different years) to the Glen Canyon superintendent, and have never received acknowledgement of my suggestions. A post card would be appreciated. NPS needs to be more people friendly.

We hate the summer at Powell! As we visited in November few boats, this is why we came as we have been to Powell several times between May and September. It is not fun during those months, crowded, noisy and lots of rude boaters vying for space.

Need more parking for trailers and cars.

The theory of first come first serve seems to be working well. Reservations are unnecessary.

Litter control and containment. Limit numbers of large group parties, increase marina security. Require boat captains for novice boat owners in boat slips.

Summer months and winter months are totally opposite. During the summer over the past several years, numbers of people and boats have increased dramatically. The more people, the more accidents, litter, contamination, damage, etc. etc.

Our visit was in the off season as I prefer to avoid crowds. It was a fantastic trip. No problems at all.

We were in a very remote back-country area. We saw only one other vehicle, one canoe and a couple of boats on the water. Had we been closer to the marinas my answers would be different.

Lake Powell is a wonderful place. Everyone should have the opportunity to experience the remarkable places and settings the lake has to offer. I have spent thirty six years (1963) exploring, recreating and raising my family there. It is an absolute treasure. Notwithstanding current sentiment- access or limitation to the general public shouldn't be restricted. I knew Glen Canyon when it was simply Glen Canyon. I have seen the growth of visitation. No one should not be allowed to freely experience this park as they see fit. We all need to be more tolerant of one another by simply being more courteous and forgiving. Develop a type of Lake Powell etiquette.

Need less rental houseboats.

I recognize that managing popular recreation areas is a difficult task, the banning of alcohol on the lake will reduce traffic and serious problems.

Enforce speed limits in narrow back canyons and have a safe distance enforcement between watercraft.

This pertains to experience. In June/July on 2 other occasions, felt impact of commercial tour boats greatly. We have a 21 foot powerboat (heavy) and still felt much turbulence north of Dangling Rope. Would like to see greater presence of National Park Service on lake and in Canyon.

Other marinas have hot showers for those who have boats docked there. Free hot showers would be nice for use by those who pay slip fees, especially for the winter months when water at the slip is turned off. There is quite a bit of winter boating at Wahweap Marina and not having water at the slip makes it a little bit of a hassle. The marina needs to enforce the policy on "no more than 10 percent over slip size" on the size of a boat in a slip. There are too many boats who are too large for the slip they are in. The excessive lengths cut into the passage way into the slip area and can make it extremely difficult to get into slip.

On a whole its a very organized lake! Everyone tryies to work together.

Rental power boats create slight problem due to operators other than English. I think the lake is just fine. Leave everything alone.

My last trip was in November so traffic at the lake was not indicative of what it usually is. You may want to send this questionnaire back in June or July!

This questionnaire has an extreme bias against motorized use of Lake Powell.

November was an extremely peaceful time to be on lake!

Lake Powell and area are great recreational areas.

Our trips (twice a year) are planned to avoid the big crowds, i.e. September after Labor Day and October to avoid Columbus Day. Our crews are very experienced. Note: Gas dock and marine personnel have always been very friendly and accommodating. We tip them well.

I was at the Glen Canyon for only one day. I enjoyed the lake and the tour we took. We toured the dam and learned a lot about the area.

We enjoyed our stay at Glen Canyon very much. Plan on renting a house boat in the year of 2000, fall preferable.

Very happy with improvements made over last few years.

Plan to bring our children very soon- at least in the next couple of years.

Glen Canyon, Lake Powell is a state treasure and we should all cooperate to keep it as clean and as beautiful as possible.

Loved the fact that nudity is permitted (the wife loved it even more).

It was the best vacation I have ever had- the sights were breathtaking. The water was clear and the sky was beautiful. The location markers could have been a little closer together, other than that everything was perfect.

Beautiful place.

This lake should be for people to use. Not for government and Park Service people to put controls on. Too many Park Service. No more.

There are no signs directing the public to any ranger stations with law enforcement present. There were rangers driving around but this seemed funny since most of the people who come to Lake Powell are out on the water. Car traffic could be slowed by speed bumps not radar guns or rangers driving the area.

I saw no enforcement (law or otherwise) in a seven day period!

Park rangers do a poor job. One example: They are so quick to issue tickets, but refuse to provide assistance. The campers next to us were issued a ticket for underage operator on a PWC- the Utah/Arizona laws are different. Most people do not realize this, nor is it clear where the boundaries are. The same day, we telephoned the Park Rangers to provide assistance to a stranded boat. There were small children in this boat with some very young, obviously inexperienced operators. The boat was in a cove, it was very rough and windy. We were unable to get in to them as our boat was too large. These people were literally holding themselves off the rocks and very scared. When the rangers were contacted, they told us they could not respond to a stranded boater unless someone were injured!! This was not a remote area, it was directly across from the stateline boat ramp. Needless to say, we were very disappointed in the help they provided. We had to return to our camp (leaving the boaters alone and scared) and come back with our jet ski to get them out. Rangers are not just law enforcers. Another problem- licensing and taxing of boats on the lake. Every ranger has a different standard because of the Utah/Arizona border. Boats kept in Arizona should be taxed and licensed in Arizona. Why should Utah receive the money when Arizona provides most of the services?

Other verbatim comments:

I am a nudist at heart and I can be nude there in privacy. Its' great to swim with nothing on. I love it.

Who wrote these are all lead questions that most people would say important or very important just by how they're worded, I am on the other hand an eccentric duck! But hopefully these things help improve futures for our kids to see.

Ski 'til I drop.

Locals are extremely rude.

During on season trips to Powell my biggest problem is loud stereos. I wish that could be controlled.

Lack of response from upper management of found concerns at lake: i.e. water pressure too high at floating pump outs, damaged docks- unsafe.

Restroom conditions:

Cows have no place on government recreation lands!

Drinking major cause of all problems.

Snowbirds on their way to Arizona utilize most of the campsites at Hite, and stay for long periods until the weather turns cold.

Need year round access to clean drinking water (taps). Drinking fountains, fish cleaning stations. Fish year round need the luxury of good clean obtainable water.

More boat ramps needed. More primitive camping needed. More developed camping needed.

This was a quiet time of year. I have experienced problems at busier times.

Remember I was on the lake during November! I will not go during June, July, August, way too many boats...for me.

During my visit in August, it was very difficult to find a beach campsite. Marina was extremely crowded at that time.

Our visit to Lake Powell was during the off season and a lot of the potential problems were not encountered.

Personal space: Some just do not understand personal space issues and go up there and then camp within 50 feet with many other possibilities open to them.

Take rangers out of trucks and put to use their boats.

Drunk people: The number of people on the lake has never seemed to be a problem in all the years I have visited but how the people act- especially when drunk- is a huge issue. They boat unsafe and stay up late keeping others up by being very loud.

Check boats for toilets, check camp sites (get out of boat!), fishing licenses.

Enforce safety rules, more floating toilets.

Please don't start over regulating everything at the lake.

I strongly oppose the closure of the land under Rainbow Bridge- especially for the same excuse of re-vegetation. If the Indians feel this is a sacred place, so be it. But so do my wife and I! We treat the area with respect and will continue to walk under the bridge (and break the law) until we die. We visit off-season for that reason.

Have rangers managing traffic at boat launch ramps during busy (weekend and holiday) periods. Restrict houseboats use of launch ramp docks. If more visitors were educated about proper behavior/courtesy enforcement may not have to be so vigorous.

Primitive restrooms are great. But marina restrooms area stink every time we go.

Mark underwater hazards more frequently as the water goes up and down.

Do not appreciate concessionaire harassment!

Reasonable price for fuel on lake and mixed fuel.

Cashiers in marina store very rude! Half the time they are speaking Navajo and ignore customers!

Appendix I

Comments Specific to Personal Watercraft

Comments Specific to Personal Watercraft

From observed unsafe boating practices:

Jet ski's cutting in on boat wake to "get air." Felt very nervous with other boats within 100 yards. No rangers to post concerns with seen for three days.

Inexperienced drivers of personal watercraft.

Personal watercraft users constantly cutting off boats and generally not being safe.

PWC jumping wakes too close to other boats.

In Slick Rock Canyon, a wave runner jumped the wake of an oncoming boat and ran over the person wake boarding behind the boat seriously injuring him.

A personal watercraft missed colliding with our double kayak by inches. As a result, he swamped our kayak. This occurred in fifty mile creek in the Escalante River. The operator knew we were paddling in there since he had already buzzed around us twice. He came blasting around a curve in a narrow part of the canyon and barely missed us. He did apologize.

Personal watercraft, excessive speed in canyons, and no regard to other boats.
Rental houseboat at fuel dock, PWC close approach to houseboat and ski-boat.

Marina- jet skiers.

Boats and skiers running at night with no lights. Jet skis closely passing fishing boats at high speed.

Jet skis

Wave runner cutting across bow of boat.

PWC's running too close to other craft.

Personal watercraft jumping over wake within 50 feet of my boat.

Personal watercraft too close and too fast near our boat and campsite.

Children bow riding, PWC closeness to boat and wake.

Children bow riding and no life vests. PWC riding in wake way too close to boats.

Too many skiers in small canyon with PWC weaving through boats and skiers.

Unreasonable speed and reckless use of personal watercraft (jet skies).

From responses to "did you feel safe on your most recent visit to Glen Canyon National Recreation Area?"

Jet ski's made overall boating negative because of their operation near my boat and friend.

With PWC at mid-lake.

From suggested management actions:

Restrictions and rules with jet-ski's.

Limit jet ski. Ten PM generator shut-off. Year round water (freezing). Control cost. Allow the poor a place to enjoy!

Limit the number of campsites in Oak canyon. Limit personal watercraft in the more remote canyons. More floating restrooms to reduce waste on beaches. Impose quiet hours when multiple house boats are camped in one canyon.

Limit the number of campsites in Oak canyon. Limit personal watercraft in the more remote canyons. More floating restrooms to reduce waste on beaches. Impose quiet hours when multiple house boats are camped in one canyon.

From open ended responses to question 20 of the mail-back survey:

Setting areas aside for PWC areas could be rotated- parents making sure young children do not use them by themselves.

I am happy with the way the lake as it is presently managed/maintained. We boat on the lake several times per year. I am not in favor of any further restrictions as they will likely degrade the experience. I have visited GLCANRA several times per year for 10+ years. I am happy with the current management of the area. I am opposed to restrictions/limits on watercraft or PWC. Although the lake launch ramps can be rather crowded in the summer, it is still possible to find relative solitude. Those who want more solitude should be encouraged to visit in the off-season, rather than restrict others from using the lake when they want to.

Power boaters who camp on shore and leave waste and litter are a problem. We saw litter and waste at every campsite. Personal watercraft are a huge problem because they are designed for speed. Narrow canyons and speed don't mix. Increase entry fee. Hire somebody to make sure every boat has a porta-potty as they enter. No pets. No jet skis- (personal watercraft) in side canyons. Educate and Enforce.

We have a houseboat partnership which we are about to terminate. Partly because the lake is much too crowded in the summer and also has become crowded in the spring and fall, which are preferred times on the lake. Lack of beach campsites, noisy boats (especially PWC's), loud and inconsiderate people, and the difficulty of finding peace and quiet influenced our decision. Although our last trip (October 22-29) was the only one (of four) that was not overcrowded. We will use our sea kayaks in the off-season to increase the opportunity of avoiding the numerous motor craft and allow camp choices away from crowded area. motor less, quiet kayaks have become our choice to provide a quality trip to Lake Powell.

I strongly disagree with banning personal watercraft and would actively oppose any efforts to do so.

In 20 years at Lake Powell the biggest problem is use and abuse of personal watercraft.

Lake Powell is a glorious place. It needs more regulation during the three summer months that allow school children to run rampant. There is also great need to curtail PWC's, they are a danger to the driver and all people and property they get near.

We don't oppose personal watercraft use on the lake. We do oppose the attitude and inconsiderate manners of the watercraft users. They typically pass fishing boats at high speeds (sometimes very closely). They ignore back of canyon wakeless areas, they leave their camp areas to noisily play in front of yours, in general they think no rules apply to them. Adults are just as rude as kids!

I love Lake Powell. We love watercrafts on the lake. Never prohibit PWC from the lake. Thanks.

I love Lake Powell, but there is a need for another boat ramp at Bullfrog, a tire break around the Hite boat ramp, another marina at Piute Farms with a paved road to it, and last but not least some control and education for the PWC operators. Most, not all are causing a lot of headaches.

Many beach areas are being contaminated with human and pet waste. "The carry out your waste" program for campers is not enforced nearly enough. The unsafe operation of boats and PWC's is getting to be a real problem all year round. I am amazed that more people have not been injured or killed by incredibly stupid boat operators. This is especially true with underage PWC operators. Less than 10 percent of the underage operators have complied with the licensing requirement. I think all boat operators should be licensed to include a tough physical and knowledge test before they can even put a boat in the water!

It is of the highest priority to maintain GLCANRA in as pristine a condition as possible and still allow a reasonable level of use by the public. If federal management practices are used, deemed necessary, then enforcement procedures should also be provided. Also this visit was off-season and therefore personal watercraft and other boaters were very scarce. Nice!

My responses were only for this off season trip. There were no personal watercraft and very few boats. Based on previous visits, safety rules and regulations need to be enforced on the lake.

PWC's are fine as long as operators are "old enough." The water condition is in the best shape I have ever seen it, the floating docks are wonderful!

Get personal watercraft and loud jet boats off the lake.

Our visit to Lake Powell was in November. We enjoy this time of year because there are very few people during this time period (October-November). We have visited during the summer months and have had some minor dislike of crowds and personal watercraft and too many boats on the water. So we choose not to go during the summer.

Get rid of Aramark. Maintain the marinas (Wahweap). Nude beach area. Skiing area. PWC area.

This survey is very biased against personal watercraft. Dumm [sic] survey. Badly worded questions on this survey. I owne [sic] houseboat- jet:sky [sic], sail boat, power boat, and hand power boat.

Inexperienced "captains" operating motorized boats is a very serious problem. The rental program is severely deficient at educating people about boat safety operation, boating rules and lake etiquette. The new waste program has resulted in cleaner beaches. PWC's are a problem, we do not own them but feel that new regulations are required. Education is needed- maybe a licensing program. Boaters that do not observe the safety limits for distance from other boats are also a big problem.

Our family has spent the last 16 years at Lake Powell, at least two times per year- mid summer usually the biggest concern is sanitation- of the lake and campsites at the shoreline. Then it's the dangerous use of jet ski's and not following the rules- Utah and Arizona need to have the same age limits for use- make it for older children, not 12 year olds. Patrolling and stopping reckless boaters would be helpful. A visual presence of NPS boats would be helpful.

Too many houseboats as well as personal watercraft.

Jet skis are a very serious problem. Either restrict them to a certain area or ban them altogether!