

Appendix W. Recreation Resources

This technical appendix describes the methods used to estimate recreation use effects at directly affected recreation areas (i.e., Mono Lake, the lower tributaries, Grant Lake reservoir, and Lake Crowley reservoir). Changes in per-capita recreation use were used as one criterion to assess the significance of effects on recreation at the directly affected recreation areas. The data obtained from onsite user surveys of visitors to Mono Lake, the lower tributaries, Grant Lake reservoir, and Lake Crowley reservoir were used to determine whether and how much visitor use would change in response to variable hydrologic conditions (i.e., lake levels for Mono Lake, Grant Lake and Lake Crowley reservoirs, and streamflow for Rush Creek). Because user surveys were not conducted along the Upper Owens River, changes in per-capita recreation use could not be estimated for this recreation area. Summary results of the user surveys are included in this appendix.

OVERVIEW

Overall changes in the use of a recreation area can be assessed by examining the average change in per-visitor use and the average change in the number of annual visitors. For evaluating the significance of potential impacts on recreation, we focused on expected changes in per-visitor use. Some respondents to the user surveys indicated that they would spend no days at an area under certain hydrologic conditions; thus, they would not be considered a part of the annual visitor population. Such use changes, however, were considered to be part of the change in per-visitor use and not part of the change in number of visitors.

The methods used to predict the effects of changes in hydrologic conditions on per-visitor use for each directly affected recreation area are described below.

MONO LAKE

Use-Estimating Methodology

The Mono Lake visitor survey was conducted during May and June 1992. The survey provided information on use levels at lake elevations of 6,372, 6,375, 6,390, and 6,410 feet. No information was obtained on use changes associated with levels lower than 6,372 feet or higher than 6,410 feet.

Average annual per-visitor use of Mono Lake in 1992, when the lake stood at elevation 7,375 feet, was 3.14 visitor days. Of the 279 respondents with whom interviews were completed, only 9% indicated that their use of the lake would change if its level decreased from its 1992 level to 6,372 feet. Of these respondents, 96% indicated their use would be less at the lower level. The average per-visitor change in use resulting from the 3-foot decline in lake level was 0.28 days per year, a reduction in per-visitor use of 9%.

An estimated 20% of visitors would change their use if the lake elevation increased from 6,375 feet to 6,390 feet. Of those indicating their use would change, 82% stated that their use would increase at 6,390 feet. Average per-visitor annual use would increase by 0.52 days (16%) if the lake level increased to 6,390 feet.

Increases in lake level above 6,390 feet are likely to result in reductions in per-visitor use. Approximately 29% of the respondents indicated their use would change if the lake level increased from 6,375 to 6,410 feet. Of these respondents, 63% indicated their use would decline. Average annual per-visitor use is the same at 6,410 feet as at 6,375 feet (3.23 days). Thus, increasing the lake level from 6,390 to 6,410 feet would, in effect, negate the increase in use that would result from raising it from 6,375 to 6,390 feet.

These results indicate that use of Mono Lake could vary in response to lake level changes associated with diversion alternatives but that the average change in per-visitor use would not exceed 16% of use under the point-of-reference scenario for lake levels ranging from 6,372 to 6,410 feet. Specifically, average use would decrease by an estimated 0.093 days per foot of decline in lake level from 6,375 to 6,372 feet, increase by 0.035 days per foot increase up to 6,390 feet, and decrease by 0.026 days per foot increase between 6,390 and 6,410 feet.

Small changes in use likely would result from changes in lake level. This conclusion is consistent with the unique recreation opportunities featured at Mono Lake. Visitors for whom Mono Lake is an incidental destination are relatively unlikely to be aware of lake level fluctuations.

Summary of User Survey Results

Results from the user surveys conducted at Mono Lake in June 1992 are summarized below.

1. Location of interview:

| | <u>Number</u> |
|-----------------------|---------------|
| South Tufa | 103 |
| Mono Lake County Park | 158 |
| Old Marina | <u>36</u> |
| Total | 297 |

2. Place of residence:

| | <u>Number</u> |
|----------------------------------|---------------|
| Metropolitan Southern California | 61 |
| San Francisco Bay area | 70 |
| Mono Basin | 2 |
| Elsewhere in California | 71 |
| Other states | 73 |
| Outside U.S. | <u>20</u> |
| Total | 297 |

3. Mean number of people in vehicle of respondent: 2.63

4. Mean length of current trip (days): 13.2

5. Mean length of time visiting Inyo and Mono Counties this trip (days): 3.62

6. Other destinations on this trip:

| <u>Other Destinations on This Trip</u> | <u>Number</u> |
|--|---------------|
| Mammoth Lakes | 103 |
| Yosemite National Park | 79 |
| June Lake Loop | 74 |
| Bodie State Park | 58 |
| Bridgeport | 36 |
| Bishop | 33 |
| Lee Vining/Lee Vining Creek | 24 |
| Convict Lake/Convict Creek | 17 |
| Death Valley | 15 |
| Devil's Postpile | 13 |
| Saddlebag/Tioga/Ellery Lakes | 12 |
| Hot Creek | 11 |
| Lake Tahoe | 10 |
| Lundy Lake | 10 |
| Mono Craters | 7 |
| Mt. Whitney | 7 |
| Bristlecone Pine Forest | 6 |
| Lone Pine | 5 |
| Rock Creek | 5 |
| Panum Crater | 3 |
| Twin Lakes | 3 |
| Lake Crowley reservoir | 3 |
| Lake Mary | 3 |
| Owens River | 3 |
| Lookout Mountain | 3 |
| Other | 39 |

7. Mean expenditures in Mono and Inyo Counties on this trip (\$/person/day):

| | |
|------------------------|-------------|
| Groceries and supplies | \$2.46 |
| Restaurants | 4.01 |
| Lodging | 6.37 |
| Camping | 0.59 |
| Auto expenses | 2.26 |
| Other | <u>0.09</u> |
| Total | \$15.79 |

8. Importance of Mono Lake as a destination for current trip:

| | |
|---------------------------------------|---------------|
| | <u>Number</u> |
| Principal destination | 76 |
| One of several important destinations | 153 |
| An incidental stop | <u>68</u> |
| Total | 297 |

9. Mean time spent at Mono Lake today (hours): 2.45

10. Percent of respondents for whom current visit to Mono Lake is one day or less: 77

11. Activities participated in at Mono Lake this trip:

| <u>Activity</u> | <u>Number Participating</u> | <u>Number for Whom Activity is Main Reason for Visiting</u> |
|------------------------------|---------------------------------|---|
| See what lake is like | 213 | 154 |
| Sightseeing | 222 | 74 |
| Organized nature hiking | 28 | 2 |
| Self-directed nature hiking | 112 | 10 |
| Birdwatching or nature study | 122 | 25 |
| Boating or canoeing | 11 | 2 |
| Picnicking | 24 | 6 |
| To rest | 40 | 9 |
| Photography | 9 | 14 |

12. Mean number of trips to Mono Lake in 3 previous years: 2.01

13. Mean number of days spent at, or expected to be spent at, Mono Lake in 1992: 3.14

14. Likelihood of visit to Mono Lake in 1993

| | <u>Number</u> |
|------------------|---------------|
| Definitely visit | 70 |
| Probably visit | 98 |
| Probably not | 79 |
| Definitely not | 48 |
| Refused | <u>2</u> |
| Total | 297 |

15. Reasons for probably not or definitely not visiting in 1993:

| | <u>Number</u> |
|---|---------------|
| Curiosity about lake has been satisfied | 16 |
| Expect to visit other areas instead | 50 |
| Moving away | 8 |
| Other | 51 |
| Refused | 2 |

16. Satisfaction with current visit to Mono Lake:

| | <u>Number</u> |
|---------------------|---------------|
| Very satisfied | 217 |
| Generally satisfied | 68 |
| Not satisfied | 11 |
| Refused | <u>1</u> |
| Total | 297 |

17. Reasons for not being satisfied with current visit:

| | <u>Number</u> |
|--------------|---------------|
| Lake too low | 9 |
| Other | 2 |

18. Preferred lake level (feet above sea level):

| <u>Alternatives Compared</u> | <u>Prefer 6,372</u> | <u>Prefer 6,375</u> | <u>Prefer 6,390</u> | <u>Prefer 6,410</u> | <u>Doesn't Matter</u> |
|----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|---------------------------|
| 6,372; 6,375; 6,390 | 2 | 26 | 111 | N/A | 2 |
| 6,372; 6,390; 6,410 | 5 | N/A | 82 | 58 | 4 |

19. Mean number of people in respondent's household: 2.42
20. Percent belonging to environmental or conservation group: 40
21. Respondent's year of birth:

| | <u>Number</u> |
|-------------|---------------|
| Before 1926 | 33 |
| 1926-1935 | 29 |
| 1936-1945 | 55 |
| 1946-1956 | 67 |
| 1956-1965 | 81 |
| 1966-1975 | 29 |
| After 1975 | 1 |
| Refused | <u>1</u> |
| Total | 297 |

22. Respondent's formal education level:

| | <u>Number</u> |
|---------------------------|---------------|
| High school not completed | 5 |
| High school completed | 37 |
| Some college | 73 |
| College graduate | 93 |
| Graduate school | 84 |
| Refused | <u>3</u> |
| Total | 297 |

23. Respondent's household income:

| | <u>Number</u> |
|---------------------|---------------|
| Under \$10,000 | 18 |
| \$10,000-\$20,000 | 24 |
| \$20,000-\$30,000 | 31 |
| \$30,000-\$40,000 | 39 |
| \$40,000-\$50,000 | 46 |
| \$50,000-\$60,000 | 43 |
| \$60,000-\$80,000 | 28 |
| \$80,000-\$100,000 | 30 |
| \$100,000-\$200,000 | 24 |
| More than \$200,000 | 5 |
| Refused | 7 |

LOWER REACHES OF AFFECTED MONO LAKE TRIBUTARIES

Use Estimating Methodology

Recent use of the lower tributaries is low because fishing opportunities were not available until the early 1980s when continuous flows were resumed. Tributary recreation opportunities will increase gradually as the streams and riparian habitats become restored as a result of maintaining minimum streamflows. Over time, public awareness of these improved recreation opportunities will increase and more people will take advantage of them. The lower tributaries will eventually attract users in numbers comparable to similar streams in the eastern Sierra region.

Per-visitor use of the lower tributaries was estimated based on survey data collected from visitors to the study-area streams in August-October 1991. The tributary user survey contained questions relating users' preferences and anticipated use levels to streamflows. When presented with descriptions of recreation opportunities associated with streamflows of 20, 60, and 100 cubic feet per second (cfs), 51% of all respondents indicated that they preferred 100 cfs, 43% preferred 60 cfs, and 6% preferred 20 cfs.

The in-person survey of tributary users was administered on both Rush and Lee Vining Creeks; however, questions pertaining to how potential changes in flows would affect use focused on Rush Creek because of survey and data limitations. Most tributary use and better photographic documentation of streamflow variations occur for Rush Creek.

A similar distribution of preferences (48%, 43%, 9%) applies to those respondents who identified lure or bait fishing as their main reason for visiting the tributaries. Among those indicating that fly fishing was their main reason, however, 76% preferred streamflows of 60 cfs and 24% preferred 100 cfs. Survey results showed that 86% of the tributary users participated in lure or bait fishing, while 29% participated in fly fishing.

Survey results were used to regress the following use-estimating equation (R-squared is 0.14; t-values are shown beneath regression coefficients; all variables are significant at the 95% level of confidence):

$$\begin{aligned} \log(\text{DAYS}) = & 0.456 + 0.0975[\log(\text{OTHR90})] + 0.0715(\text{SQRTFLO}) \\ & (4.92) \qquad \qquad \qquad (6.22) \\ & + 0.0642(\text{FLYFISH}) - 0.198(\text{OTHFISH}) - 0.116[\log(\text{INCOME})] \\ & (4.06) \qquad \qquad (6.44) \qquad \qquad (3.28) \\ & + 0.1029(\text{UNRETIRED}) - 0.204(\text{FLXSTABL}) \\ & (3.12) \qquad \qquad \qquad (8.28) \end{aligned}$$

where:

| | | |
|-----------|---|--|
| DAYS | = | per-visitor annual visitor days on the lower tributaries, |
| OTHR90 | = | days spent recreating at other eastern Sierra recreation areas in 1990; |
| SQRTFLO | = | the square root of the mean May-October streamflow on lower Rush Creek; |
| FLYFISH | = | a dummy variable set to 1 if the respondent participated in fly fishing, and to 0 otherwise; |
| OTHFISH | = | a dummy variable set to 1 if the respondent participated in bait or lure fishing, and to 0 otherwise; |
| INCOME | = | respondent's household income; |
| UNRETIRED | = | a dummy variable set to 1 if the respondent was born after 1926, and to 0 if born before 1926; and |
| FLXSTABL | = | a dummy variable set to 1 if Rush Creek flows were relatively unstable over the recreation season, and to 0 if they were stable. Flows were considered stable if they fluctuated by less than 100% of the minimum flow over the recreation season. |

The range of streamflows described in the user surveys was substantially narrower than the range subsequently resulting from the diversion alternatives using the Los Angeles Aqueduct Monthly Program (LAAMP) operations model. Survey respondents evaluated Rush Creek streamflows ranging from 20 cfs to 100 cfs, while LAAMP projections ranged from 0 to 165 cfs in normal runoff years and up to 490 cfs during extremely wet years. The projected high flows resulted largely from requirements for periodic channel flushing imposed on LAAMP simulations for the tributaries. These discrepancies limit the applicability of the use-estimating equation for assessing tributary use impacts for wet runoff years, and for the 6,390-Ft, 6,410-Ft, No-Restriction, and No-Diversion Alternatives.

The regression analysis showed that average annual per-visitor use increases with average streamflow and with the stability of flows over the season. The positive coefficient on FLYFISH and the negative coefficient on OTHFISH indicate that fly fishing anglers spend more days on the lower tributaries than average for all respondents, and bait and lure anglers spend fewer days than average. Overall, respondents spent an average of 1.5 days on the lower tributaries in 1991, when flows averaged roughly 50 cfs over the recreation season.

Survey results indicate that average annual per-visitor use of the lower tributaries would change by approximately 0.02 days (1.3%) per 1-cfs change in average streamflow for flows ranging from 20 to 100 cfs.

Summary of User Survey Results

Results from the user surveys conducted along Rush and Lee Vining Creeks between August and October 1991 are summarized below.

1. Location of interview:

| | <u>Number</u> |
|------------------------|---------------|
| Upper Rush Creek | 97 |
| Lower Rush Creek | 1 |
| Upper Lee Vining Creek | 98 |
| Lower Lee Vining Creek | 4 |
| Mill Creek | 4 |
| Convict Creek | <u>46</u> |
| Total | 247 |

2. Place of residence:

| | <u>Number</u> |
|----------------------------------|---------------|
| Metropolitan Southern California | 174 |
| San Francisco Bay area | 17 |
| Mono Basin | 5 |
| Elsewhere in California | 49 |
| Out of state | <u>1</u> |
| Total | 246 |

3. Mean number of people in vehicle of respondent: 2.44

4. Mean length of current trip (days): 20.1

5. Mean length of time visiting Inyo and Mono Counties this trip (days): 9.93

6. Other destinations on this trip:

| <u>Other Destinations on This Trip</u> | <u>Number</u> |
|--|---------------|
| June Lake Loop | 95 |
| Mammoth Lakes | 85 |
| Bridgeport | 74 |
| Bishop | 64 |
| Saddlebag/Tioga/Ellery Lakes | 37 |
| Convict Lake/Convict Creek | 28 |
| Mono Lake | 25 |
| Lundy Lake | 22 |
| Owens River | 20 |
| Lee Vining Creek | 18 |
| Big Pine | 15 |
| Hot Creek | 10 |
| Bodie State Park | 10 |
| McGee Creek | 7 |
| Agnew Lake | 6 |
| Lake Crowley reservoir | 6 |
| Pleasant Valley reservoir | 5 |
| Devil's Postpile | 5 |
| Hawthorne, NV | 4 |
| Tremble Lake | 3 |
| Death Valley | 3 |
| Other | 22 |

7. Mean expenditures in Mono and Inyo Counties on this trip (\$/person/day):

| | |
|------------------------|-------------|
| Groceries and supplies | \$2.32 |
| Restaurants | 1.61 |
| Lodging | 2.41 |
| Camping | 1.08 |
| Auto expenses | 2.22 |
| Other | <u>0.01</u> |
| Total | \$9.65 |

8. Mean number of days spent at tributary at which interview occurred this trip: 7.1

9. Mean number of hours spent at tributary today: 6.0

10. Activities participated in at tributary this trip:

| <u>Activity</u> | <u>Number Participating</u> | <u>Number for Whom Activity is Main Reason for Visiting</u> |
|---------------------------|-----------------------------|---|
| Bait/lure fishing | 213 | 157 |
| Fly fishing | 71 | 20 |
| Birdwatching/nature study | 97 | 9 |
| Swimming | 8 | 0 |
| Picnicking | 80 | 4 |
| Hiking | 133 | 1 |
| Camping | 151 | 49 |
| Photography | 131 | 1 |
| Enjoying the outdoors | 11 | 1 |
| Bicycling | 4 | 4 |
| Hunting | 2 | 1 |
| Off-road vehicle use | 1 | 0 |

11. Percent who visited Mono/Inyo County region in 1990: 73

12. For 1990 visitors, mean number of separate visits to region in 1990: 2.92

13. For 1990 visitors, mean number of days spent on lower reaches of Mono Lake tributaries in 1990: 1.32

14. For 1990 visitors, mean total number of days spent on upper reaches of Mono Lake tributaries in 1990: 9.88

15. Number of respondents visiting other streams or lakes in the eastern Sierra Nevada in 1990: 76

16. Mean number of days spent on, or expected to be spent on, lower reaches of Mono Lake tributaries in 1991: 1.54

17. Preferred lower tributary streamflow (excludes 36 respondents interviewed at Mill or Convict Creek who did not visit lower tributaries in 1990-1991):

| <u>Prefer 20 cfs</u> | <u>Prefer 60 cfs</u> | <u>Prefer 100 cfs</u> |
|----------------------|----------------------|-----------------------|
| 13 | 90 | 107 |

18. Mean number of people in respondent's household: 2.56

19. Percent belonging to environmental or conservation group: 22

20. Respondent's year of birth:

| | <u>Number</u> |
|-------------|---------------|
| Before 1926 | 33 |
| 1926-1935 | 35 |
| 1936-1945 | 47 |
| 1946-1956 | 68 |
| 1956-1965 | 53 |
| 1966-1975 | 9 |
| After 1975 | 0 |
| Refused | <u>2</u> |
| Total | 247 |

21. Respondent's formal education level:

| | <u>Number</u> |
|---------------------------|---------------|
| High school not completed | 9 |
| High school completed | 53 |
| Some college | 93 |
| College graduate | 59 |
| Graduate school | 30 |
| Refused | <u>3</u> |
| Total | 247 |

22. Respondent's household income:

| | <u>Number</u> |
|---------------------|---------------|
| Under \$10,000 | 8 |
| \$10,000-\$20,000 | 14 |
| \$20,000-\$30,000 | 34 |
| \$30,000-\$40,000 | 38 |
| \$40,000-\$50,000 | 29 |
| \$50,000-\$60,000 | 31 |
| \$60,000-\$80,000 | 35 |
| \$80,000-\$100,000 | 23 |
| \$100,000-\$200,000 | 17 |
| More than \$200,000 | 2 |
| Refused | <u>16</u> |
| Total | 247 |

GRANT LAKE RESERVOIR

Use-Estimating Methodology

Changes in per-visitor use of Grant Lake reservoir were estimated from survey results of responses to questions pertaining to how use would change if alternative hydrologic scenarios were adopted. Scenarios differed based on their average lake level and on the stability of the lake level over the recreation season. Three alternative scenarios are presented in Figure W-1.

Survey results indicate preferences for higher and more stable lake levels. For example, in comparing Scenarios 2 and 3, 54% of the respondents preferred Scenario 2, 40% were indifferent, and 5% preferred Scenario 3. In comparing Scenarios 1 and 2, which have roughly equal average lake levels, 48% preferred the more stable scenario (Scenario 1), 42% were indifferent, and 9% preferred the fluctuating scenario (Scenario 2).

Respondents were also asked whether their use of Grant Lake reservoir under the scenarios would change from their anticipated use under the planned schedule of operations. Depending on the scenario, between 54% and 73% of the respondents indicated that their use would not change from their anticipated use. Among scenarios considered, per-visitor use would change the most under Scenario 1, an increase of 2.8 days per year. This change represents a 30% increase over the average 1991 Grant Lake reservoir use level of 9.6 days for survey respondents. Per-visitor use would increase by 1.7 days (18%) under Scenario 2 and would decrease by 0.7 days (8%) under Scenario 3.

The median lake level under Scenario 2 reservoir operations was 22 feet lower than the median level under Scenario 3 (Figure W-1). Assuming that per-visitor use changes at a rate constant with changes in median lake level between these two scenarios, use would change by an average of 0.1 days (1.0%) per 1-foot change in median lake level. Survey results also indicate that changing from an operating schedule characterized by approximately 10 feet of lake-level fluctuation over the recreation season (Scenario 2) to a schedule with the same average level but only 2 feet of vertical fluctuation (Scenario 1) would result in an average use increase of 1.1 days (11%).

Summary of User Survey Results

Results from the user surveys conducted at Grant Lake reservoir between August and October 1991 are summarized below.

1. Location of interview:

| | <u>Number</u> |
|-------------------|---------------|
| Grant Lake marina | 91 |
| Uncontrolled area | <u>8</u> |
| Total | 99 |

2. Place of residence:

| | <u>Number</u> |
|----------------------------------|---------------|
| Metropolitan Southern California | 71 |
| San Francisco Bay area | 1 |
| Mono Basin | 3 |
| Elsewhere in California | 23 |
| Out of state | <u>1</u> |
| Total | 99 |

3. Mean number of people in vehicle of respondent: 2.59

4. Mean length of current trip (days): 15.7

5. Mean length of time visiting Inyo and Mono Counties this trip (days): 12.4

6. Other destinations on this trip:

| <u>Other Destinations on This Trip</u> | <u>Number</u> |
|---|---------------|
| June Lake Loop (other than Grant Lake reservoir) | 65 |
| Mammoth Lakes | 28 |
| Bishop | 17 |
| Saddlebag/Tioga/Ellery Lakes | 15 |
| Lundy Lake | 14 |
| Bridgeport | 14 |
| Convict Lake/Convict Creek | 9 |
| Lee Vining/Lee Vining Creek | 8 |
| Owens River | 8 |
| Mono Lake | 7 |
| Pleasant Valley reservoir | 6 |
| Lake Crowley reservoir | 4 |
| Big Pine | 3 |
| Topaz Lake | 3 |
| Yosemite National Park | 3 |
| Other | 12 |

7. Percent of respondents for whom Grant Lake reservoir is the principal destination for current trip: 66

8. Mean expenditures in Mono and Inyo Counties on this trip (\$/person/day):

| | |
|------------------------|-------------|
| Groceries and supplies | \$2.03 |
| Restaurants | 1.86 |
| Lodging | 2.97 |
| Camping | 0.87 |
| Auto expenses | 1.95 |
| Other | <u>0.04</u> |
| Total | \$9.72 |

9. Mean number of days spent at Grant Lake reservoir this trip: 5.3

10. Mean number of hours spent at Grant Lake reservoir today: 4.3

11. Activities participated in at Grant Lake reservoir this trip:

| <u>Activity</u> | <u>Number Participating</u> | <u>Number for Whom Activity is Main Reason for Visiting</u> |
|---------------------------|-----------------------------|---|
| Boating | 9 | 1 |
| Waterskiing | 1 | 1 |
| Windsurfing | 3 | 1 |
| Trolling for trout | 12 | 1 |
| Float-tubing for trout | 2 | 1 |
| Shore fishing for trout | 93 | 85 |
| Fishing for other species | 1 | 1 |
| Wading | 7 | 0 |
| Birdwatching/nature study | 26 | 0 |
| Picnicking | 21 | 0 |
| Camping | 29 | 4 |
| Enjoying the outdoors | 1 | 0 |

12. Percent who visited Mono/Inyo County region in 1990: 74

13. For 1990 visitors, mean number of separate visits to region in 1990: 3.34

14. For 1990 visitors, mean number of days spent on lower reaches of Grant Lake reservoir in 1990: 11.7

15. Number of respondents visiting other eastern Sierra Lakes in 1990: 58

- 16. Mean number of days spent at, or expected to be spent at, Grant Lake reservoir in 1991: 9.61
- 17. Percent of respondents who visited Grant Lake reservoir before June 1 this year: 17
- 18. Respondent satisfaction with Grant Lake reservoir recreation opportunities this year:

| | <u>Number</u> |
|---------------------|---------------|
| Very satisfied | 21 |
| Generally satisfied | 68 |
| Not satisfied | 7 |
| Refused | <u>3</u> |
| Total | 99 |

- 19. Preferred reservoir level management alternative (see Figure W-1 for scenario description):

| Scenarios | | | | |
|-----------------|----------|----------|----------|---------------|
| Scenarios | <hr/> | | | Doesn't |
| <u>Compared</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>Matter</u> |
| (2,3) | NA | 20 | 2 | 15 |
| (1,3) | 0 | NA | 21 | 8 |
| (1,2) | 16 | 3 | NA | 14 |

- 20. Mean number of people in respondent's household: 2.78
- 21. Percent belonging to environmental or conservation group: 16
- 22. Respondent's year of birth:

| | <u>Number</u> |
|-------------|---------------|
| Before 1926 | 28 |
| 1926-1935 | 19 |
| 1936-1945 | 17 |
| 1946-1956 | 16 |
| 1956-1965 | 17 |
| 1966-1975 | 2 |
| After 1975 | 0 |

21. Respondent's formal education level:

| | <u>Number</u> |
|---------------------------|---------------|
| High school not completed | 8 |
| High school completed | 23 |
| Some college | 36 |
| College graduate | 26 |
| Graduate school | 6 |

22. Respondent's household income:

| | <u>Number</u> |
|---------------------|---------------|
| Under \$10,000 | 5 |
| \$10,000-\$20,000 | 7 |
| \$20,000-\$30,000 | 15 |
| \$30,000-\$40,000 | 19 |
| \$40,000-\$50,000 | 12 |
| \$50,000-\$60,000 | 11 |
| \$60,000-\$80,000 | 15 |
| \$80,000-\$100,000 | 4 |
| \$100,000-\$200,000 | 5 |
| More than \$200,000 | 1 |
| Refused | 5 |

LAKE CROWLEY RESERVOIR

Use-Estimating Methods

Survey respondents at Lake Crowley were presented with information on planned reservoir water operations in 1992 and on four alternative scenarios. Scenarios 1 and 2 maintained stable water levels, and Scenarios 3 and 4 were characterized by fluctuating water levels. The median water level under Scenario 1 exceeded that under Scenario 2 by 18 feet, the same amount that the median level under Scenario 3 exceeded that under Scenario 4. Planned 1992 operations were moderately stable at a median level between that of Scenarios 1 and 2. The four alternative scenarios are presented in Figure W-2.

Almost all respondents ranked Scenarios 1 and 3 over Scenario 2, and Scenario 2 over Scenario 4. Scenarios 1 and 3 were not directly compared. These results indicate that users prefer higher water levels over lower levels and, at least at lower levels, prefer relatively stable water levels over fluctuating levels.

Respondents were asked how their use would change if various scenarios were substituted for planned 1992 operations, under which the lake level would average 6,767 feet. Under this scenario, use of Lake Crowley reservoir by all respondents would average 13.0 days. Relative to anticipated use, Scenario 4 elicited the largest use response, an average decrease of 5.1 days per visitor. Under Scenario 3, average annual use would decrease by an average of 3.7 days. Annual per-visitor use would increase by an average of 3.1 days under Scenario 2 and by 4.4 days under Scenario 1.

These results indicate that, on average, per-visitor use would increase by approximately 0.46 days for each 1-foot increase in the reservoir's median water level, a substantially greater rate of change than was estimated for Grant Lake reservoir (0.1 day per foot).

Summary of User Survey Results

Results from the user surveys conducted at Lake Crowley reservoir between August and October 1991 and during April 1992 are summarized below.

1. Location of interview:

| | <u>Number</u> |
|---------------------------|---------------|
| South Landing | 184 |
| North Landing | 87 |
| Pleasant Valley reservoir | <u>52</u> |
| Total | 323 |

2. Place of residence:

| | <u>Number</u> |
|----------------------------------|---------------|
| Metropolitan Southern California | 196 |
| San Francisco Bay area | 4 |
| Mono Basin | 32 |
| Elsewhere in California | 88 |
| Out of state | <u>3</u> |
| Total | 323 |

3. Mean number of people in vehicle of respondent: 2.60

4. Mean length of current trip (days): 8.31

5. Mean length of time visiting Inyo and Mono Counties this trip (days): 6.95

6. Other destinations on this trip:

| <u>Other Destinations on This Trip</u> | <u>Number</u> |
|--|---------------|
| Bishop | 86 |
| Convict Lake/Convict Creek | 57 |
| Mammoth Lakes | 47 |
| June Lake Loop | 20 |
| Owens River | 17 |
| Twin Lakes | 13 |
| Lone Pine | 7 |
| Hot Creek | 6 |
| Pleasant Valley Reservoir | 5 |
| McGee Creek | 4 |
| Big Pine | 4 |
| Saddlebag/Tioga/Ellery Lakes | 4 |
| Mono Lake | 3 |
| Mt. Whitney | 3 |
| Other | 26 |

7. Percent of respondents for whom Lake Crowley reservoir is the principal destination for current trip: 61

8. Mean expenditures in Mono and Inyo Counties on this trip (\$/person/day):

| | |
|------------------------|-------------|
| Groceries and supplies | \$3.60 |
| Restaurants | 2.84 |
| Lodging | 4.05 |
| Camping | 0.49 |
| Auto expenses | 3.31 |
| Other | <u>0.19</u> |
| Total | \$14.48 |

9. Mean number of days spent at Lake Crowley reservoir this trip: 3.79

10. Mean number of hours spent at Lake Crowley reservoir today: 6.22

11. Activities participated in at Lake Crowley reservoir this trip (for respondents interviewed at Lake Crowley reservoir only:

| <u>Activity</u> | <u>Number Participating</u> | <u>Number for Whom Activity is Main Reason for Visiting</u> |
|---------------------------|-----------------------------|---|
| Boating | 107 | 26 |
| Waterskiing | 39 | 21 |
| Windsurfing | 7 | 0 |
| Trolling for trout | 96 | 66 |
| Float-tubing for trout | 46 | 30 |
| Shore fishing for trout | 209 | 110 |
| Fishing for other species | 65 | 7 |
| Wading | 41 | 1 |
| Birdwatching/nature study | 56 | 1 |
| Picnicking | 68 | 2 |
| Camping | 90 | 3 |
| Hiking | 44 | 2 |
| Bicycling | 5 | 0 |
| Hunting | 1 | 0 |

12. Percent who visited Mono/Inyo County region in 1990: 80
13. For 1990 visitors, mean number of separate visits to region in previous year: 4.04
14. For 1990 visitors, mean number of days spent at Lake Crowley reservoir in previous year: 12.96
15. Number of respondents visiting other eastern Sierra Lakes in previous year: 152
16. Mean number of days spent at, or expected to be spent at, Lake Crowley reservoir in 1991:
- | | |
|--------------------------------|------|
| Fall 1991 survey respondents | 20.3 |
| Spring 1992 survey respondents | 5.6 |
| All respondents | 13.0 |
17. Percent of 1991 respondents who visited Lake Crowley reservoir before June 1: 48

18. Respondent satisfaction with Lake Crowley reservoir recreation opportunities in 1991 (for respondents who visited Lake Crowley reservoir in 1991):

| | <u>Number</u> |
|---------------------|---------------|
| Very satisfied | 51 |
| Generally satisfied | 137 |
| Not satisfied | <u>55</u> |
| Total | 243 |

19. Preferred reservoir level management alternative (see Figure W-2 for scenario description):

| Scenarios | | | | | |
|-----------------|----------|----------|----------|----------|---------------|
| Scenarios | | | | | Doesn't |
| <u>Compared</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>Matter</u> |
| (4,3) | NA | NA | 63 | 6 | 18 |
| (4,1) | 49 | NA | NA | 2 | 7 |
| (3,2) | NA | 20 | 31 | NA | 19 |
| (2,1) | 50 | 1 | NA | NA | 11 |
| (4,2) | NA | 22 | NA | 5 | 14 |

20. Mean number of people in respondent's household: 2.84
21. Percent belonging to environmental or conservation group: 25
22. Respondent's year of birth:

| | <u>Number</u> |
|-------------|---------------|
| Before 1926 | 31 |
| 1926-1935 | 42 |
| 1936-1945 | 76 |
| 1946-1956 | 100 |
| 1956-1965 | 58 |
| 1966-1975 | 15 |
| After 1985 | <u>0</u> |
| Total | 322 |

21. Respondent's formal education level:

| | <u>Number</u> |
|---------------------------|---------------|
| High school not completed | 24 |
| High school completed | 61 |
| Some college | 105 |
| College graduate | 92 |
| Graduate school | 38 |
| Refused | <u>2</u> |
| Total | 322 |

22. Respondent's household income:

| | <u>Number</u> |
|---------------------|---------------|
| Under \$10,000 | 4 |
| \$10,000-\$20,000 | 24 |
| \$20,000-\$30,000 | 33 |
| \$30,000-\$40,000 | 45 |
| \$40,000-\$50,000 | 46 |
| \$50,000-\$60,000 | 24 |
| \$60,000-\$80,000 | 58 |
| \$80,000-\$100,000 | 32 |
| \$100,000-\$200,000 | 34 |
| More than \$200,000 | 12 |
| Refused | <u>10</u> |
| Total | 322 |