E5.2 EXISTING AND POTENTIAL RECREATION USE AND NEEDS ANALYSIS

This section provides a description of existing and potential recreational uses within the Project area. The following nine studies and their results include:

- Questionnaire Survey—Section E5.2.1;
- Existing Recreation Use Study—Section E5.2.2;
- Reservoir Boating Study—Section E5.2.3;
- Projected Recreation Use Analysis—Section E5.2.4;
- Recreation Carrying Capacity Analysis—Section E5.2.5;
- Shoreline Day Use Public Access Analysis—Section E5.2.6;
- Recreation Suitability Analysis—Section E5.2.7;
- Whitewater Boating Study—Section E5.2.8; and
- Recreation Needs Analysis Synthesis—Section E5.2.9.

The results of the first study are presented in Section E5.2.1—Questionnaire Survey. This study develops Project area recreation user profiles from information collected in a recreation survey. Responses to the survey provided information on visitor demographics, users' desired recreational opportunities and facilities, quality of experiences, and user satisfaction levels. Issues related to crowding, user conflicts and social carrying capacity were also addressed. In addition to general visitors, additional surveys were conducted and were aimed at other user groups, including area residents, recreation-related businesses, and focus groups.

The second study collected user counts at Project area recreation facilities and use areas and is presented in Section E5.2.2—Existing Recreation Use Study. The objective of this study was to estimate existing recreational use surrounding and on the Project reservoirs and along the river reaches. Counts for both developed and dispersed sites were collected. This study identified the types, levels and distribution of use at several locations and reservoir-wide.

The third study is presented in Section E5.2.3—Reservoir Boating Study and describes existing boating use and water surface management on Project reservoirs. To better define issues and solutions, Lake Almanor was divided into four segments and multiple reservoir pool levels were considered. Besides conducting watercraft counts, law enforcement issues were also addressed as well as boating infrastructure. Other topics discussed included boating use levels, boater perceptions, on-water boating capacity, and boating regulations and management.

The fourth study projects recreation activity levels in the Project area through the term of the new license (assumed to be 30 years for planning purposes) and is presented in Section E5.2.4—Projected Recreation Use Analysis. This study also discusses visitors' places of origin and levels of activity participation, and provides a summary of regional recreation opportunities as they related to future recreation use levels in the Project area.

The fifth study is presented in Section E5.2.5—Recreation Carrying Capacity Analysis. There are limits to how much recreation use existing facilities can accommodate, as well as how much use various land and surface water areas can accommodate. This analysis investigated the existing capacity of recreation resources using four indicators: ecological capacity, physical/spatial capacity, facility capacity and social capacity. Using information collected in several of these studies, the Recreation Carrying Capacity Analysis addresses the maximum level of use that may be accommodated without significantly impacting the user's experience, sensitive resources, and Project operations. This analysis is done at the reservoir-wide level, as well as the site level. Judgments are made as to whether a site or an area is below, approaching, at, or exceeding capacity, based on a review of the four capacity indicators. Limiting factors are also identified for each site and area.

The sixth study addresses the ability of the public to access Project shorelines for day use activities. This study is presented in Section E5.2.6—Shoreline Day Use Public Access Analysis. This study collected and analyzed resource, facility, and land management information to identify opportunities and constraints on public access to Project shoreline areas for day use activities. (Campground access and opportunities are addressed in Section E5.2.7—Recreation Suitability Analysis.) Section E5.2.6 evaluates public versus private access to the shoreline, investigates, future private development impacts on public access, and discusses Project operational impacts on public access, if any.

The seventh study in Section E5.2.7—Recreation Suitability Analysis identifies areas that are suitable for potential new recreation facility development (expansion of existing facilities and new site development). A number of resource constraints were considered using GIS technology, as well as opportunities for development. Candidate areas in the Project area were identified that may be considered for helping meet a portion of the recreation facility needs in the future.

The eighth study is presented in Section E5.2.8—Whitewater Boating Study and was prepared by Confluence Research and Consulting, as well as EDAW, Inc. This study was designed to identify recreational opportunities along the Belden and Seneca Reaches in the Project area, and to examine how flow levels affect those opportunities. The initial focus of this study was on the feasibility of whitewater boating, the flows required for boating, and the impacts those flows may have on other recreational resources. A controlled flow study for whitewater recreation was conducted in 2000. Based on further agency and stakeholder input, this study was expanded to also address fishing and other recreational opportunities on the river. The controlled flow studies also addressed fish habitat and hydrology resource issues.

The ninth and final study is presented in Section E5.2.9—Recreation Needs Analysis Synthesis. This section synthesizes the results of the previous studies and identifies existing and future recreation needs in the Project area over the term of the new license.

Additional related recreation studies may also be found in separate sections of Report E5: Recreation Resources. These other studies include: (1) Section E5.6 National Wilderness Areas, Wild and Scenic Rivers, and Trails; and (2) Section E5.7 Economic Impacts of Lake Almanor and Project Recreation Resources. Please refer to these other sections for study results and analysis.

These needs are assessed for both existing and potential future recreation facilities, as well as undeveloped, dispersed sites. The study results are presented for overall recreational activities in the Project area, such as camping or trail use; and then on a site-by-site basis. These results are presented using demand, supply, and capacity/suitability indicators, based on the results of each study. The needs identified in this study should not be assumed to be the full responsibility of the Licensee, rather, they represent the broad needs in the study area. The Licensee has selected some of these recreation needs and has proposed them as recreation PMEs, as discussed in Section E5.4—Recreation Proposals, and in Section E5.5—Responsible Parties, Schedules, and Costs.

Executive summaries for the nine studies in Section E5.2 are presented below.

QUESTIONNAIRE SURVEY (E5.2.1)

The objective of the Questionnaire Study is to develop recreation user profiles for the Project's recreation areas and most popular primary recreation groups. Four main surveys were conducted:

- Recreation Visitor Survey,
- Area Resident Survey,
- Recreation-Related Business Owner/Operator Survey, and
- Focus Group Interviews.

Recreation Visitor Survey

Response to the Recreation Visitor Survey revealed that the average visitor to the Project area was 50 years of age, with visitation split evenly between male and female. Visitors also had some college education, on average, and visitors to Lake Almanor had a higher income than those at Butt Valley Reservoir, and significantly higher than Belden Reach. Visitors also traveled in groups of four or five people utilizing two vehicles. Swimming, fishing, sightseeing, and wildlife observation were the most popular activities, with Lake Almanor being the most popular overall destination in the Project area. More developed activities were preferred at Lake Almanor, while, more natural settings were preferred at Butt Valley and Belden Reach.

Overall, the Project area was perceived as a "special place" because of the scenery and peace and quiet provided by the surroundings. Crowding was not perceived as a significant problem, although on-water respondents did perceive slight crowding.

It is important to note that during 2001, the year that the visitor surveys were conducted, California experienced a drought year and the California energy crisis. As a result, Lake Almanor's elevation was at a comparatively low lake level compared to previous years

and likely influenced some responses. In previous years since the mid-1990s, the Licensee was able to maintain relatively high summer water years primarily due to good hydrologic water years. During 2001, 42 percent of survey respondents felt that the water level of Lake Almanor was inadequate, while only 29 percent felt that it was adequate. The comparatively low water year at Lake Almanor also appeared to influence visitor perceptions of safety, with a third of survey respondents reporting that they felt water levels were unsafe at the lake.

Area Residents

The second group surveyed was the area residents, with three categories of user groups distinguished: reservoir shoreline (Lake Almanor) residents, reservoir back-lot residents, and town and environs residents. The survey focused on recreation-related issues, needs and perceptions that apply specifically to area residents.

Overall demographic results revealed that most respondents were aged 45 years and up (95 percent shoreline residents, 89 percent back lot residents, 86 percent town and environs) and most (95 percent) were from California. Over 90 percent of all residents had visited Lake Almanor while only 10 percent had visited Butt Valley Reservoir or Belden Reach. The highest use of the area came in late summer, and the majority of residents visited the reservoir with friends. Swimming was the most common activity, though it was much more common amongst shoreline (80 percent) and back-lot residents (75 percent) than town residents (52 percent). Fishing (70 percent/70 percent/56 percent)

and hiking (60 percent/60 percent/50 percent) were second and third most popular activities.

The most significant problems perceived by the residents were related to the water level, with 90 percent of shoreline, 81 percent back-lot, and 64 percent of town residents considering water levels a significant problem. Directly related to water levels, exposed land was also considered a problem by residents (85 percent, 75 percent, 50 percent). Other problems residents found were floating debris, noise from boats and PWCs, and boat speeds and wakes.

Opinions diverged among residents on the topics of developed recreation elements, with significantly more town residents finding a need for additional restrooms, showers, and fish cleaning stations, while shoreline residents did not find much need. Back-lot residents were slightly more likely to consider a need for these elements than shoreline residents and less than town residents. The largest gap in opinion came on the topic of shoreline access, with 70 percent of town and environs and 50 percent of back-lot residents feeling that current access is inadequate, while only 17 percent of shoreline residents felt this was an issue.

Recreation-Related Business Owner/Operator Survey

Several businesses in the Project area were asked to participate in this survey that consisted of two pages of open-ended questions. The questionnaire was mailed to the businesses in May 2001, with a follow-up mailing in July 2001 to increase responses.

Results revealed that the average length of time that the businesses had been in operation was 14.25 years, with the longest being 55 years while the shortest was three years. The businesses could be divided into three categories: automotive/marine equipment repair and sales; guide services; and sporting goods stores. Fifty percent (6) of the respondents were sporting goods stores, while 42 percent were guide services and 17 percent were automotive/marine repair and sales businesses. Seven of the businesses claimed that their customers were non-local in origin, while four claimed their customers were both local and non-local, and one business said that its customers were locals.

According to the respondents, Lake Almanor and Butt Valley Reservoir were the top destinations within the Project area, though Lassen Volcanic National Park was among the top three visited sites. Lake Almanor was considered an Extremely Important Project site, while Butt Valley Reservoir and Belden and Seneca Reaches were considered Not Very Important sites for the customers.

Business owners' impressions of Project facilities revealed a sense that there needs to be better access to the Project area. Owners' impressions included a need for more boat ramps, including keeping the one on the west shore open in winter and fixing the one at Butt Valley, and increasing the number and availability of campgrounds, restrooms, and showers. They also felt that the lake levels were too low, driving on the beach shore should be discontinued, and that the campgrounds were too close to Lake Almanor.

The majority of respondents do not have plans to expand their businesses. Reasons given as limiting factors include: low income-to-disposable cash ratio for residents and visitors; owner is near retirement; owner/operator has limitations on facilities; or their business is a home business. Increased flow of tourists or more business would prompt owners to expand their businesses, two respondents said, though responses to the question of how much room they have to expand ranged from "none" to "three-fourths of an acre."

Focus Group Interviews

Focus groups were identified as a need when concern was expressed by the Plumas County 2105 Committee that particular groups of Chester residents might not be adequately represented in the studies conducted during the 2001 recreation season. Six groups were identified, including: local teens, seniors and people with disabilities, anglers, hunters, winter recreation users, and recreational boaters.

The overall impressions of all the groups seemed to focus on lake levels, specifically that it was too low, making the lake unusable. This effect may have been augmented by the fact that 2001 water levels were historically low. However, two groups felt that low water levels were positive. Specifically, low water levels were seen as a boon to fishing and winter recreation access.

Little consensus occurred among the groups; though teens, boaters, anglers, and seniors/persons with physical disabilities felt that fishing was a primary activity on the reservoir. Shoreline access was mentioned most often among the groups as a

demand/conflict issue, with boaters, anglers, winter recreationists, and seniors/people with physical disabilities agreeing on this matter. Only the seniors/people with disabilities felt that this necessitated additional facilities, however, with the seniors/people with disabilities expressing a desire for ADA-accessible fishing sites at Lake Almanor and Butt Valley Reservoir, while anglers desired vehicular access to Catfish Beach, with signage.

EXISTING RECREATION USE (E5.2.2)

The objective of the Existing Recreation Use Study is to estimate existing Project-related recreational use, primarily reservoir recreation. This study is needed since FERC regulations require estimates of existing and potential recreation use at the Project, in daytime and overnight visitation, as well as a description of the methods used to estimate use (CFR 1998).

This section estimates recreation use and activities at individual developed recreation sites, as well as at dispersed undeveloped recreation sites within the study area. Recreation use was estimated for the primary recreation season for each area (fishing and summer seasons for Butt Valley Reservoir and year-round for Lake Almanor).

The study area includes all Licensee, Forest Service, and privately owned developed recreation sites within or adjacent to the FERC Project boundary. For research purposes, the study area was divided into four resource areas: Lake Almanor, Butt Valley

Reservoir, Seneca Reach, and Belden Reach. All discussed study area sites are within one of these four resource areas.

Lake Almanor is located in the northeast corner of the Project area at 4,494 feet (high pool level) above sea level (asl) (Licensee datum) (Licensee 2000b). The reservoir offers 27,092 surface acres at full pool (Licensee 1987). There are approximately 52 miles of shoreline for recreational use (Steinstra 2000). The Licensee and the Forest Service have provided four family and large group camping areas at Lake Almanor as well as six day use and picnicking facilities.

There are 22 private resorts and RV campgrounds around Lake Almanor. Most of them provide rooms; some have RV spaces or cabins. Most of them have boat launches and some have boat and PWC rentals.

Butt Valley Reservoir is located approximately 4 miles south of Lake Almanor at an elevation of 4,140 feet (Licensee 2000b). At maximum pool level, the reservoir has about 1,600 surface acres and 49,897 acre-feet of capacity. Opportunities for recreation at Butt Valley Reservoir include camping, fishing, hiking, boating, and swimming. Recreation facilities developed by the Licensee at the reservoir are comprised of two campgrounds on the eastside and one DUA and boat launch at Butt Valley Reservoir called Alder Creek DUA/Boat Launch. Powerboats are allowed on the reservoir; however, a Plumas County ordinance prohibits PWC use and waterskiing (Plumas County Visitors Bureau 1998).

There are two recreational river reaches on the UNFFR in the Project study area. The upper reach is Seneca Reach; it begins below Lake Almanor Dam and runs south approximately 11 miles to Caribou Powerhouse 1, just above Belden Forebay. The lower reach is Belden Reach; it begins at the Belden Forebay and runs southwest approximately 9 miles to the confluence with the east branch of the UNFFR near SR 70.

Seneca Reach provides dispersed recreational opportunities such as hiking and fishing, and there are also private mining operations along the reach. This portion of the UNFFR has restricted access because of the steep, rugged terrain and private in-holdings. There is a county road that begins at SR 89 near the Lake Almanor Dam and leads to the small community of Seneca. There is a Forest Service-maintained angler trail that travels upstream from Caribou Powerhouse 1 at the downstream end of this reach. The trail appears to be well-used and maintained for the first 3 miles or so, and includes two river footbridges.

Belden Reach is much more accessible than Seneca Reach. The entire length of the reach runs parallel to Caribou Road (which intersects SR 70). The Forest Service operates three campgrounds along this portion of the river, while the Licensee operates Belden Rest Stop at SR 70 and the Belden Powerhouse. Recreational activities in this area include camping, fishing, hiking, and swimming.

As part of assessing existing demand and use levels, this study identified the types, levels, and distribution of use at study locations. Measures used as part of this assessment

included seasonal visitation, non-holiday weekend people-at-one-time (PAOT), holiday weekend PAOT, and recreation days (RDs). An RD is defined as a single visit to a recreation area for any part of a 24-hour period. These commonly utilized measures are useful for managers as they consider present conditions while planning for future recreation needs at Project sites.

Recreation use data were recorded at day use areas by observation and traffic counters to identify types, levels, and distribution of use in the resource areas. Results from the study revealed that day use areas generally did not reach or exceed capacity, with the one exception of Canyon Dam Boat Launch/DUA where vehicle-at-one-time (VAOT) counts averaged well over 100 percent of capacity during the summer season. Overall mean VAOTs did not exceed 50 percent of capacity for any of the four resource areas, even during holiday periods. Total recreational visitation for day use areas was approximately 532,000 RDs, with Canyon Dam, Almanor West Day Use Area, and Lake Almanor Beach recording the highest activity levels. This total excludes the Hamilton Branch, which is another hydroelectric project area (currently being studied by the Licensee). These measures were consistent with VAOT and PAOT measurements taken at the sites. The most frequently observed activity over the entire study area was swimming and sunning, with general recreation and then picnicking being the next most popular. Eleven of the 20 day use areas at Lake Almanor had 50 or less visitors observed during the entire sampling period. This trend was also observed at the day use areas in the other three resource areas, with all sites having 50 or less visitors observed.

Campground data were obtained from operators (Licensee and Forest Service) and from owners of private overnight resorts. Campground occupancy was generally approaching capacity, with the exception of Lake Almanor Campground and the three Belden campgrounds which exceeded capacity on several days. Of those private resorts surveyed, few exceeded capacity on any days. Occupancy percentages ranged from 47 percent for Little Norway to 97 percent for Big Cove.

RESERVOIR BOATING STUDY (E5.2.3)

The objective of the Reservoir Boating Study is to describe existing boating use and water surface management on Project reservoirs in order to assess whether management should be considered. This study makes use of data collected during other studies, including Section E5.2.1—Questionnaire Survey, and Section E5.2.2—Existing Recreation Use.

The study area contains two Project reservoirs, Lake Almanor and Butt Valley Reservoir.

Lake Almanor

At full pool level Lake Almanor is 4,494 feet asl (Licensee datum) (Licensee 2000b). When at this level, it offers 27,092 surface acres and approximately 52 miles of recreational shoreline. Even when drawn down as low as 4,467 feet asl, Lake Almanor is one of the largest reservoirs in the state with over 19,000 surface acres, smaller only than Lake Shasta (30,000 acres at full pool) and Clear Lake (43,000 acres at full pool).

Because of drought conditions and the effects of the 2001 California energy crisis, the 2001 season was a particularly low water year. From late May through mid-June of the 2001 recreation season, elevation was about 4,480 feet asl or 14 feet below the full pool level, which corresponds to about 23,600 surface acres, or 13 percent less than full pool. The pool level elevation fell to 4,476 feet asl by late July, and 4,474 feet asl by early October. The annual low for 2001 was measured on November 9 at 4,471.8 feet asl and 21,179 surface acres. Under normal water year conditions, the Licensee operates Lake Almanor between 4,494 and 4,467 feet, with water elevations targeted not to go below 4,474 feet asl prior to September 15.

Butt Valley Reservoir

Butt Valley Reservoir is located approximately 4 miles south of Lake Almanor at an elevation of 4,140 feet asl at full pool level (Licensee datum) (Licensee 2000b). At this level, the reservoir has 1,600 surface acres and a 49,897 acre-foot capacity. Low pool level is approximately 4,135 feet asl with 1,510 surface acres, 6 percent less than at high pool level. Results of this study addressed the five study components below.

Local Boating Issues

Results in this section focus on boating issues in the Lake Almanor and Butt Valley Reservoir study area that relate to accident statistics, law enforcement problems, a summary of regulations, and a discussion of management issues. Results for these three topics follow, except for law enforcement as information was not available from the Plumas County Sheriff's Department in 2002.

Accidents were spread fairly evenly over the 12-year period from 1990 to 2001, with the highest number of accidents occurring (seven) in 1993. During this period, a total of 38 accidents were recorded, resulting in 28 individual injuries, four deaths, and $50,400 in reported property damage. No deaths were reported during 9 of the 11 years.

Boating at Project reservoirs is regulated through protective space zoning which requires that boats not exceed 5 nautical mph when within a certain distance (100-300 feet) of elements such as the shore, boat launches, people in the water, or fish spawning areas. Speed limits are not to exceed 5 mph within 30 minutes after sunset and before sunrise of the following day. Additional regulations restrict waterskiing and overnight stays on boats. Butt Valley Reservoir has a posted speed limit of 25 mph and restrictions against waterskiing and PWC use.

Focus group interviews with recreation interest groups in Chester also yielded a number of managerial concerns, focusing on lake levels and safety. The boating focus group expressed concern for lake level effects on boating safety, particularly the existence of the three main islands in the lake, and an increase in the number of hazard logs. Participants suggested possible safety measures such as publishing a map indicating the known hazards, and placing warning markers on hazards in the lake such as placing a strobe light on the tip of the peninsula and on Goose Island to aid navigation in the dark.

Boating Use Levels

Use levels of Lake Almanor appear to be moderate, even during peak use weekends and holidays. The average number of watercraft observed on the water at one time (BAOT) at Lake Almanor from mid-May to mid-October was 112 watercraft (all types). The peak number of watercraft observed (BAOT) was 183 watercraft during the July 4th weekend in 2001. These counts compared with the surface water acres available reveal very low boating densities at Lake Almanor for both the average and peak boat counts. This is not surprising given the very large size of the reservoir. Assuming a lower pool level of 23,600 acre-feet found in late July of 2001, boating densities were 211 acres per boat and 183 acres per boat for average BAOT and peak BAOT counts, respectively. Comparing these densities with a typical standard of 25 acres minimum per boat reveals significant surplus boating area capacity. The boating densities at Lake Almanor were 7.3 to 8.4 times lower than the 25 acres per boat minimum standard suggesting that boating densities are not a problem at Lake Almanor, even in a normal water year. Several types of boats are likely to be active on the water at most times, but powerboats (including fishing and pleasure boats) and PWC dominate. Paddle-powered boats and sailboats are present in lesser numbers, in particular during the peak use season.

Boating Infrastructure

Boating infrastructure at present appears to be generally adequate to meet current demand at both Project area reservoirs. However, parking at public boat launches at both reservoirs is at or approaching capacity and launch ramp lanes could be lengthened on at least one public boat launch at Lake Almanor.

Boaters' Perceptions

Around one-third of boaters considered each segment of Lake Almanor to be not at all crowded, while around another third considered them slightly crowded. Around 20 percent considered each segment moderately crowded, while 5 percent or fewer considered them extremely crowded or close to that level. Perceptions of on-water crowding were similar at Butt Valley Reservoir, with slightly more considering the reservoir not at all crowded and fewer considering it moderately crowded.

Less than 12 percent of boaters on either Project area reservoir considered user conflicts due to boat noise, speed, wakes, behavior, or other interactions to be more than a slight problem. One exception was the 19 percent of Lake Almanor boaters who considered interaction with PWCs to be a moderate problem (13 percent) or a big problem (6 percent).

Few boaters on either Project area reservoir consider the ability to launch a boat or shoreline development and use to be a problem, or more than a slight problem. Boaters at either location did not express majority support for any of three recreational developments proposed on the mail survey questionnaire: creation of no-wake zones, additional day use, and overnight moorage facilities. From around one-third to one-half of Lake Almanor boaters felt the amount of various boating-related developments and services currently provided were too low. Fish cleaning stations, restrooms near shore, and boat-in primitive campsites were perceived as particularly deficient.

Less than 30 percent of Butt Valley Reservoir respondents expressed similar opinions about these developments and services, with the exception of fish cleaning stations and boat-in primitive campsites (62 percent and 48 percent, respectively, consider the number provided to be too low).

During the 2001 low water year, over 40 percent of Lake Almanor boaters considered the water level to be moderately or totally unacceptable in terms of its effect on their enjoyment. One-third felt that way about its effect on recreation safety, though only one accident was reported on Lake Almanor, generally less than most years. Butt Valley Reservoir boaters were much less concerned about water level, with 13 percent considering them unacceptable in terms of effects on enjoyment and 9 percent rating them unacceptable in terms of safety.

Surface Water Boating Capacity

Boating use levels are not estimated to be approaching capacity, even assuming scenarios of the highest boating use occurring on the minimum operating levels (i.e., the 4,466.7 ft elevation for Lake Almanor). This conclusion takes into account potential limiting factors related to ecological capacity, spatial capacity, facility capacity, and social capacity. Public launching capacity was found to be exceeded during limited peak use times at Lake Almanor when low pool levels (i.e., 4,475 ft elevation) reduce or eliminate use of some public launch facilities. The Alder Creek DUA/Boat Launch at Butt Valley Reservoir experienced crowding during the non-peak month periods.

Recommendations

It is recommended that monitoring at Lake Almanor and Butt Valley Reservoir include boaters' perceptions of conditions, and indications of increased conflict or decreasing safety, in addition to standard use level measures. These become more crucial if any significant changes are noted in the character or amount of boating use in the Project area.

Based on vehicle counts in 2001, over capacity use was observed at Lake Almanor at the two public boat launches in 2001. As a result, additional boat launch parking capacity is needed, likely at Canyon Dam Boat Launch/DUA. Launch lane capacity and wait times do not appear to be a problem, nor is surface water area capacity. Additionally, at one of the two public boat launches, launch lanes should be extended to the low pool level. This should probably occur at Canyon Dam Boat Launch/DUA. From the public's perspective, there was low demand for more boat access facilities (public launches or private marinas) in 2001, with the exception of a new north shore boat launch. From a lake geographic and distribution perspective, a new public boat launch at the north shore is also recommended.

PROJECTED RECREATION USE ANALYSIS (E5.2.4)

The overall goal of the Projected Recreation Use Analysis Study is to project recreation activity levels in the Project area through the term of the new Project license (assumed to be approximately 30 years, or until 2035, for planning purposes). This information will

be used in other studies to estimate when or if recreation use levels reach the capacity of existing recreation facilities and use areas.

The study area includes two groups of recreation facilities and use areas (Level 1 and Level 2). For Level 1 recreation sites and use areas, detailed data from Section E5.2.2—Existing Recreation Use Study was used to project recreation use levels for sites at Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches. These sites are generally located within and adjacent to the FERC Project boundary and can be assumed to be in the Project's area of influence. Nineteen Level 2 private commercial resorts were also included in this analysis.

Objectives that addressed the overall goal of this study included:

- Assess areas of visitors' origin and projected changes in the population of these areas;
- Assess participation trends for recreational activities occurring in the Project area; and
- Assess the role of Project recreation resources in the region.

The results of these objectives are summarized below.

Areas of Visitors' Origins and Projected Changes in the Population of these Areas

The majority (89 percent) of visitors to the public recreation developments and dispersed use areas at the Project study area were from California, while 9 percent were from

Nevada and 3 percent from other western states including Oregon, Washington, Utah, and Arizona. Just over a quarter of visitors were from Butte County, CA. Visitors from Plumas and Lassen Counties in California and Washoe County in Nevada accounted for nearly 20 percent of visitors to the Project area. The remaining visitors were from various counties in California, Nevada, and other states, though no single county accounted for a large percentage of visitors.

Rapid growth has been occurring in many of these counties and is projected to continue through the year 2035, with the populations of several counties in California and one in Nevada expected to increase over 100 percent by 2035. Additionally, the population of California will increase by approximately 57 percent by 2035, while the population of Nevada will increase by 145 percent. This increase in county and state populations will likely result in continued increases in the number of visitors to and the participation rates of activities occurring in the Project area resulting in sustained and increased demand for Project recreation resources and facilities.

Participation Trends for Recreational Activities Occurring in the Project Area

Recent visitor surveys measured current activity demand while projections of regional recreation activity demand were based primarily on data obtained by the most recent results from a national survey (Cordell 1999). These data were used to assess recent trends in participation that may suggest future trends. Although these trends may not continue for the full term of the new license, they do provide some direction in estimating future demand for activities occurring in the Project area.

Many of the popular activities in the Project area and their projected increase in demand are listed below, followed by their existing participation rates:

High Projected Regional Demand Increases (50% or more)

Activity	Current Project Area Participation
Hiking	66 %
Sightseeing	60 %
Observing wildlife	49 %
Photography	49 %
Boating—non-motorized	9 %

Moderate Projected Regional Demand Increases (30-50%)

Activity	Current Project Area Participation
Swimming	71 %
Beach use	49 %
Motorboating	48 %
Picnicking	44 %
Biking	43 %
Waterskiing	36 %
Camping—developed	33 to 40 %

Low Projected Regional Demand Increases (less than 30%)

Activity	Current Project Area Participation
Fishing—shore	71 %
Fishing—boat	71 %
OHV use	14 %

Using this information, demand was projected for each of the Level 1 recreation sites in the Project area. Site-level demand was assessed by applying the projected annual increases in participation in various activities (which incorporate changes in population and demographics) to existing use figures at each recreation site.

Looking at visitor use trends for RV/tent camping over the last 16 years at Lake Almanor Campground, there was a peak in use levels in 1993, followed by flat or declining use levels through 2001. The Forest Service reports similar use level trends at their Lake Almanor facilities, as well as at nearby Lassen National Park. Use levels in 2001 were a few percentage points below previous years and likely bounced back in 2002. These trends tend to indicate that demand has leveled off somewhat from its peak in 1993. This trend has been observed elsewhere in the West and Pacific Northwest by researchers. Additionally, public shoreline campsites that are a premium for many campers are generally at capacity resulting in an overall flattening of the use levels. Alternatives to shoreline camping, such as at Almanor Campground (North and South units), are less desirable for some campers. Use levels at this campground are not surprisingly lower compared to Lake Almanor Campground.

Future build-out of new planned communities in the Lake Almanor area (three in the east shore area plus Dyer Mountain Resort to the east) will likely impact future use levels at day use/picnic areas and boat launches, not campground facilities. The impact of these new future communities is discussed in Section E5.2.4 Projected Recreation Use Analysis.

Given recent trends in use levels at Lake Almanor, plus future planned development in the area, researchers feel confident about demand projections in this study. At the same time, demand will continue to change over time and will need to be reassessed

periodically during the term of the new license. The proposed Monitoring Program in the Draft RRMP is intended to address this issue.

The Role of Project Recreation Resources in the Region

Several qualities distinguish the Project area from other regional recreation areas. It is easily accessible via highways from all directions and is in proximity to many major population centers. The cooler, temperate climate of the Project area, due to its location in the Sierra Nevada Mountains at 4,500 ft in elevation, is a large attraction to visitors from hotter valley areas. Finally, the Project area has a mix of public and private/resort recreation facilities, country and community clubs, and residential development that is uncommon in many of the other recreation areas in the region.

Belden and Seneca Reaches

Belden and Seneca Reaches are primarily steep, forested river canyons, though overall they are very different from one another. Belden Reach has fairly good access with many more developed facilities and dispersed shoreline sites. The Seneca Reach is more remote, with limited access, far fewer dispersed campsites, and less fishing access. Seneca Reach allows a far more primitive fishing experience with many opportunities for solitude as a result of the steep, rugged terrain. One of the unique characteristics of Belden Reach is the opportunity for dispersed shoreline camping and day use, an activity not always available at other recreation areas, including Seneca Reach. Based on the unique features of Seneca and Belden Reaches, demand will continue to increase in the future for the recreational opportunities available there.

Lake Almanor

The role of Lake Almanor in the region is unique because of its large-size reservoir surface water area, moderate to high level of development, good highway access, mix of public and private development, cooler temperate summer climate, and opportunities for relatively quiet and remote as well as developed experiences. Lake Almanor is a popular area for various recreational activities including motorboating, waterskiing, PWC use, camping, hiking, and fishing. Use levels at Lake Almanor are considered high by many in comparison to other areas. This takes into consideration the amount of water-based recreation and general patterns of development and use on land.

Butt Valley Reservoir

Butt Valley Reservoir is unique in that it is primarily used for fishing. Large motorboats and PWC are not allowed on the reservoir. This lack of faster, higher powered boats and PWC adds to the quiet and remote setting and enhances the quality of the fishing experience at Butt Valley Reservoir. Based on the unique features of Lake Almanor and Butt Valley Reservoir, demand will continue to increase in the future for the recreational opportunities available at each reservoir.

Based on the unique features of the Seneca and Belden Reaches, as well as Lake Almanor and Butt Valley Reservoir, demand will continue to increase in the future for the recreational opportunities available there.

RECREATION CARRYING CAPACITY (E5.2.5)

The primary purpose of the Recreation Carrying Capacity study is to investigate the capacity of the recreation facilities in the Project area to meet demand without negatively affecting sensitive resources and recreational experiences.

The study area encompasses the lands within and adjacent to the FERC Project boundary at Lake Almanor and Butt Valley Reservoir, and areas of the Belden and Seneca Reaches that are used for recreational purposes. Included within the study area are 16 Level 1 developed facilities and 19 private commercial resorts (open to the public). The study area for this analysis excludes the on-water surface area of the two reservoirs and Belden Forebay, which are addressed in the Reservoir Boating Study (see Section E5.2.3).

The capacity threshold methodology used in this study was adapted from indicators used in other hydroelectric project relicensings and by federal agencies (the Forest Service, BLM, and others) including facility capacity utilization percentages at differing timeframes. Indicators are applied to the "season," defined as mid-May to mid-September, and to the "peak months," defined as the months when use levels are highest (July and August). Also, the percentage of days that a site surpassed 90 percent utilization was a third indicator considered. Capacity thresholds were determined for campgrounds and DUAs/boat launches in the Project area. Campground and boat launch thresholds were considered in total for each recreation resource area (Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches, with exceptions for group camps and remote sites), while thresholds for DUAs were considered on a site-by-site basis.

Capacity assessments are presented on a site-specific and reservoir-wide level (both reservoirs and river reaches), along with an overall capacity assessment for the study area. Capacity evaluations are presented based on four capacity types: ecological, physical/spatial, facility, and social. A summary of this analysis is provided, along with judgments as to whether each site or area is below, approaching, at, or exceeding capacity based on a review of the four capacity types.

Ecological capacity is considered a limiting factor at four of the sites on Lake Almanor (Almanor Group Reservation Camp, Almanor Overflow Campground, Almanor Rest Area, and Canyon Dam Boat Launch/DUA). Ecological concerns include large areas of bare soil and compaction due to unconfined vehicle and pedestrian traffic in certain areas; proximity to sensitive creeks, vernal pools, and riparian areas; and wave or user-caused shoreline erosion impacts. Significant ecological impacts were not observed at any of the sites at Butt Valley Reservoir or along the Belden and Seneca Reaches. Overall, ecological capacity is not considered a general limiting factor in the Project area. However, raptor nest sites do constrain several areas of Lake Almanor.

Physical/spatial capacity is a limiting factor at only two of the facilities on Lake Almanor (Lake Almanor Campground and Almanor Scenic Overlook). In general, physical space for recreation development is adequate along the west shore of the lake, although it is limited along much of the eastern shoreline by steep topography and the proximity of SR 147. Overall, physical/spatial capacity on the land is not considered a limiting factor at Lake Almanor.

Neither is physical/spatial capacity considered a limiting factor at any of the three sites on Butt Valley Reservoir (Cool Springs Campground, Ponderosa Flat Campground, and Alder Creek DUA/Boat Launch). Physical expansion area for potential new recreation development is available along the east shore of Butt Valley Reservoir. Conversely, topographical and shoreline constraints are limiting factors to the physical/spatial capacity of two (North Fork Campground and Gansner Bar Campground) of the three campgrounds along the bypass reaches.

Facility capacity is a current or potential future limiting factor at most of the developed recreation sites at Lake Almanor. Specifically, two campgrounds (Camp Conery Group Camp, Lake Almanor Campground), one boat launch (Canyon Dam Boat Launch/DUA), and one picnic/rest areas (Canyon Dam DUA) approached or exceed capacity thresholds. While utilization of the Almanor Boat Launch does not exceed the seasonal or peak month capacity thresholds, facility capacity is a limiting factor at this site because the boat ramp is unusable during lower pool elevations. Facility capacity will likely be a limiting factor at most other developed recreation sites at Lake Almanor in the future as demand for these types of sites increases.

Facility capacity over the license term is considered a limiting factor at all of the developed recreation sites at Butt Valley Reservoir. Utilization of the two campgrounds (Ponderosa Flat Campground and Cool Springs Campground) is below or approaching capacity, while utilization of Alder Creek DUA/Boat Launch exceeds capacity. This

indicates that in the long-term, overall facility capacity is a limiting factor at Butt Valley Reservoir.

Facility capacity is a current or potential future limiting factor at most of the developed recreation sites along Seneca and Belden Reaches. Specifically, all three Forest Service campgrounds approach or exceed capacity thresholds. While use levels at the Belden Rest Stop do not currently exceed capacity, facility capacity will likely be a limiting factor in the future at this site. There are no developed recreation sites along the Seneca Reach.

The primary indicator of social capacity is visitors' perceptions of crowding. Perceived crowding varies at the sites on Lake Almanor. The overall crowding score for visitors surveyed at Lake Almanor indicates that crowding perceptions are approaching the area's social capacity and visitors are feeling "slightly crowded." Overall, these results indicate that social capacity is not a limiting factor at Lake Almanor at this time.

Perceived crowding is variable at the sites on Butt Valley Reservoir, with the overall crowding score for visitors surveyed indicating that they feel slightly to moderately crowded and that the area is generally at its social capacity level. This score is the highest of the three major Project areas. Additionally, nearly a quarter (22 percent) of visitors to Butt Valley Reservoir felt the recreation sites were more crowded than they expected. Overall, these results indicate that social capacity is at capacity and is considered a limiting factor at Butt Valley Reservoir.

As indicated by the overall crowding score of 3.8 (approaching social capacity), visitors surveyed feel slightly crowded at the two reaches. Overall, these results indicate that social capacity is not considered a limiting factor at Belden and Seneca Reaches.

Overall, recreational use levels are approaching capacity for the recreation season as a whole. During the peak summer months of July and August, recreation use levels at some sites approach or exceed capacity. However, even when the facility capacity at some sites has been reached or exceeded, use at other developed recreation sites remains at levels that approach or are below capacity.

Of the nine developed campgrounds assessed in this analysis, one campground is at or exceeding capacity: Camp Conery Group Camp. Likewise, two of the ten day use areas currently exceed capacity: Canyon Dam Boat Launch/DUA and Alder Creek DUA/Boat Launch. Overall use levels are approaching capacity at the two reservoirs and Project river reaches at this time.

The capacity concern is based on the overall use level at the recreation site or reservoir and should be used to prioritize potential management actions as they relate to capacity. Only three of the developed recreation sites included in this analysis are characterized as having a high capacity concern. These sites are Canyon Dam Boat Launch/DUA, Camp Conery Group Camp, and Alder Creek DUA/Boat Launch. Of the remaining developed recreation sites, 13 are considered of moderate and three of low capacity concern. At the

reservoir level, Lake Almanor, Butt Valley Reservoir, and the Project river reaches are all of moderate capacity concern at this time.

PUBLIC ACCESS ASSESSMENT (E5.2.6)

The purpose of the Public Access Assessment Study is to evaluate public access opportunities in the Project area. There are several ways that the public can access the Project. Most visitors access the Project at Lake Almanor by vehicle and then by foot. Public roadway access to the Project reservoirs and bypass reaches is generally close by. Roadway access is relatively good in and around the Lake Almanor area, which is accessed via SR 89 and 36, as well as SR 147. However, some areas on Lake Almanor have limited or restricted vehicle access due to site constraints. Butt Valley Reservoir is accessed via Butt Valley Road, a county road to the south of SR 89. The lower stretch of the UNFFR is accessible to the public via Caribou Road, which runs parallel to the Belden Reach and intersects with SR 70. The upper Seneca Reach, however, has fairly restricted access due to the steep, rugged terrain. A Plumas County road runs parallel to the river in this area; however, access to the river is generally by foot only and the road is not close to the river except near the small community of Seneca.

The public can also access many Project shorelines by boat. Fluctuating or lower pool level elevations and normal shallow water make accessing certain shoreline areas on Lake Almanor and Butt Valley Reservoir difficult or impossible. Additionally, steep topography on Butt Valley Reservoir, and Belden Forebay, as well as the two bypass reaches (Seneca and Belden), limit the areas where a boat can be pulled up on shore.

Despite these limitations, visitors to the Project area do access existing developed and dispersed recreation sites by boat.

Existing recreation facilities and use areas that provide public access in the study area are owned and operated by both public and private entities including the Licensee, Forest Service, private resort owners, and private residential communities with associated private recreation facilities along the shoreline. All public recreation facilities, those owned and operated by the Licensee and Forest Service, are open to the general public during established timeframes. However, private recreation facilities are either: (1) open to the general public as a commercial venture (boat launches and resorts), or (2) are owner or membership-only (e.g., residential communities with shoreline recreation facilities). Private operators require a fee for use of a facility (boat launches at a resort), restrict use only to those visitors staying at the facility (i.e., patrons at a resort), or restrict use to homeowners or members (private residential areas). While private recreation facilities are discussed as areas of reduced public access in this study, they nonetheless play an important role in the overall public recreational opportunities of the Project area, particularly related to public boat launching and moorage.

In general, many public shoreline access opportunities exist in the UNFFR Project area. However, the level of access is variable and dependent on location. For example, public access around Lake Almanor tends to be mainly focused on the southwestern shoreline of the reservoir. Most of the land categorized as high public access and all developed recreation facilities, except one, are located in this area of the reservoir. A primary

constraint on new public access sites around Lake Almanor is the large amount of non-Licensee private land. Private residential and/or timber land can and does play an important role in the overall recreational opportunities available in the Project area. However, such private land is generally considered a constraint to public access for purposes of this analysis.

Public access around Butt Valley Reservoir is confined to the northeastern shoreline, as there is essentially no road access along the southwestern shoreline. Most lands categorized as high public access are on the northeastern shoreline, and existing recreation facilities are already located on these lands. The steep slopes around most of Butt Valley Reservoir limit new public access opportunities on the reservoir.

Most developed public access sites along the two river bypass reaches (Seneca Reach and Belden Reach) are located on the southern half of the Belden Reach. Most dispersed recreation sites, some of which provide access to the river, are also located on the Belden Reach. Existing public access sites tend to be located in the high and moderate public access areas of the river reaches. Very few possibilities for new public access opportunities exist along the river reaches, as steep slopes severely limit new development.

To better distribute public access sites at Lake Almanor for both area residents and visitors, several improvements may be considered in the future. Ten candidate sites were identified in this assessment to potentially improve public access. At some of these sites,

plans are currently being considered by the Licensee and Forest Service to develop additional public access opportunities. New facilities and improvements may be considered at the following areas:

- North Shore Campground Area – This area on the northern shoreline of Lake Almanor may be considered as a potential boat launch site to provide improved boat launching for citizens of the town of Chester and other northern communities.
- Catfish Beach Area – Three potential options may be considered for the Catfish Beach area, located on the northwestern shoreline of the Lake Almanor Peninsula. The first option is to develop the area as a drive-in/walk-in only day use site. The second option is to develop the area as a boat-in only day-use site. The third option is to develop the area as a drive-in/walk-in and/or boat-in primitive campsite and day use site.
- Hamilton Branch Area – The area upstream from the Hamilton Branch Powerhouse was recently constructed to provide an improved angler access site to enhance fishing opportunities on the Hamilton Branch. The Almanor Fishing Association operates this site. This site is part of the Hamilton Branch Development.
- Stumpy Beach Area – The "unofficial" public access site at Stumpy Beach/Birdrock, located on the eastern shoreline of Lake Almanor, may be considered for day use picnicking and beach improvements. Potential

development at this site is contingent on provision of safe access from SR 147 and Caltrans approval.

- Westwood Beach Area – Located north of Stumpy Beach on the eastern shoreline of Lake Almanor, Westwood Beach is also an unofficial public access site that may be considered for improvements for day use picnicking and beach access. As with Stumpy Beach, potential development at Westwood Beach is contingent on provision of safe access from SR 147 and Westwood community Services District approval.
- Prattville Area to Canyon Dam Boat Launch/DUA Area – Vehicular access to the shoreline at Lake Almanor is a management problem, but also a popular means of enjoying the shoreline. Such use should be properly managed, but not eliminated. Located on the southwestern shore of Lake Almanor, the area from north of Prattville to the Canyon Dam Boat Launch/DUA could be restricted to a few (4) vehicular access points to the reservoir shoreline at 4,494 ft elevation. Other less suitable vehicle access points on Lake Almanor should be barricaded and/or rehabilitated to protect sensitive ecological and cultural resources. Some of these restrictions have already been initiated by the Forest Service.
- Almanor Campground (North and South Units) Improvements – The Forest Service plans to renovate and reconstruct both Almanor Campground North and South as part of a 2006 Capital Improvement Program project. Additionally, as part of this project, the Forest Service plans to relocate the group site and renovate the existing Almanor Picnic Area (formerly called

Rest Area) and convert it into a day use picnic facility. These renovations will improve public access.

- Almanor Boat Launch Improvements – The Forest Service plans to renovate the existing Almanor Boat Launch. Planned improvements include resurfacing the boat ramp, adding two courtesy docks, repairing and repaving the parking areas, widening and repaving the access road to the boat ramp and parking area, and constructing two ADA-accessible restrooms with improvements to the sewer system and new signs.
- Canyon Dam Boat Launch/DUA Improvements–The Forest Service plans to improve the existing Canyon Dam Boat Launch/DUA. Planned improvements include replacement of an old vault toilet with an ADA-accessible toilet, replacement of the courtesy dock, replacement and installation of traffic and interpretive signs, and installation of a potable water system.
- Lake Almanor Recreation Trail Extension – The Forest Service plans to extend the Lake Almanor Recreation Trail another 1.5 miles from Lake Almanor Campground to the Canyon Dam Boat Launch/DUA.

To better distribute public access sites at Butt Valley Reservoir for both residents and visitors, several improvements may be considered in the future. Currently, only one site has been identified in this assessment to improve public access.

- Butt Valley Reservoir Angler Access – Located at the northern end of Butt Valley Reservoir, the area immediately below the Butt Valley Powerhouse is

currently a popular undeveloped fishing access site. To mitigate erosion and increase ease of access, several trails and parking areas may be considered at this site. A longer trail connecting the powerhouse with Cool Springs Campground may also be considered.

Currently, no new or improved public access developments are needed in either of the Seneca or Belden Reaches. However, a small car-top boat launch may be considered at the Belden Forebay near Caribou Village.

RECREATION SUITABILITY ANALYSIS (E 5.2.7)

The objective of the Recreation Suitability Analysis is to identify areas that are suitable for potential new recreation facility development (expansion of existing facilities and new site development) consistent with the resource opportunities and constraints of the Project area. The overall analysis assesses the suitability of existing Project area lands to accommodate potential new recreation development, if needed to help meet existing and future recreation demand.

This study provides an analysis of recreation site development suitability using GIS technology that assesses opportunities and constraints to potential recreation development in the study area, such as new campgrounds or DUAs. GIS recreation opportunity and constraint maps from the Shoreline Day Use Public Access Analysis (see Section E5.2.6) were used as a starting point to create recreation site development suitability maps for

this study. The composite GIS suitability maps were developed to visually display the areas with the greatest potential for new public recreation development.

The study area includes all lands and waters within 0.25 mile of the FERC Project boundary surrounding Lake Almanor and Butt Valley Reservoir, as well as Seneca and Belden Reaches. The Project's water conveyance system corridors (canals, pipelines, flumes, penstocks, etc.) are excluded from this analysis as the public is generally discouraged from using these types of Project facilities for recreation purposes.

Seventeen existing public developed recreation sites are included in this analysis along with 24 undeveloped dispersed lakeside sites at Lake Almanor; three undeveloped dispersed lakeside sites on Butt Valley Reservoir; two undeveloped dispersed riverside sites on the Seneca Reach; and 20 undeveloped dispersed riverside sites on the Belden Reach. Additionally, 31 private recreation facilities were included in the analysis.

Analysis of Recreation Development Suitability

The opportunity and constraint maps were overlayed to develop a composite suitability map depicting areas of potentially high, moderate, and low recreation development suitability. Recreation suitability classifications and corresponding rankings are listed in the table below. The resulting composite suitability map shows the most suitable sites (or polygons) for future potential recreation development, if needed.

For example, highly suitable potential recreation development areas are those where high opportunities and low or no constraints exist, whereas lower suitable potential recreation areas will be those where high constraints and low or no opportunities exist.

Recreation Suitability Classifications and Rankings Considered

Suitability Classification		Suitability Ranking			
		High	Moderate	Low	Excluded
Water	Reservoirs/Rivers				X
Project Facilities	Dams, Powerhouses, etc.				X
Recreation Use	Existing Public Recreation Sites	X			
	Proximity to Existing Public Recreation Sites	<250 feet			
	Dispersed Sites		X		
	Private Commercial Resorts (open to the public)		X		
	Private Recreation Facilities (closed to the public)			X	
	Private Residential Facilities (closed to the public)			X	
Slope	0–20 percent	X			
	20–40 percent		X		
	Greater than 40 percent			X	
Property Ownership	Licensee	X			
	Forest Service	X			
	Private Commercial (Big Cove Private Commercial Zone)		X		
	Private Undeveloped		X		
	Private Developed			X	
Road Access	Proximity to Existing Highways and Connectors	<1000 feet	>1000 feet		
Shoreline Erosion	Proximity to Known Areas of Significant Erosion		<250 feet		
Special Status Plants	Proximity to Identified Plant		<500 feet	<100 feet	
Sensitive Nest Sites	Bald Eagle		<0.5 mile	<0.25 mile	
	Other		<600 feet	<350 feet	
Wetlands/Riparian	Existing			X	
	Identified Inundation Area			X	
	Proximity to Existing Wetland/Riparian Area		<250 feet		

Source: EDAW, Inc.

This GIS-based analysis is a planning tool intended to identify potential areas for possible recreation development in the 44,439-acre (including surface water acres) Project area, should new facilities be needed to satisfy existing or future recreation needs. Because of the larger pixel size and larger scale of some of the GIS data layers, this analysis is not intended to be used to site small-scale development, such as trails. Some areas, called excluded areas, were removed from this GIS recreation development suitability analysis. The surface water areas of Lake Almanor and Butt Valley Reservoir are not rated and are shown as a blue color on the figures. Project hydroelectric facilities, labeled and shown in red, were also excluded. Excluded areas account for approximately 61 percent of the study area, as shown in the table below. The remaining 17,384 acres (39 percent) of the Project area are addressed in this analysis.

Acreage of Land in the UNFFR Recreation Suitability Analysis

Site	Acreage	Percentage of Recreation Resource Area Acreage	Percentage of Total Project Study Area Acreage
Lake Almanor	34,356	—	77
Excluded	25,326	74	57
Included	9,030	26	20
Butt Valley Reservoir	3,570	—	8
Excluded	1,559	44	4
Included	2,011	56	5
Bypass Reaches	6,513	—	15
Excluded	170	3	0.4
Included	6,343	97	14
Project Study Area	44,439	—	—
Excluded	27,055	—	61
Included	17,384	—	39

Source: EDAW, Inc.

Note: Excluded acreages include water surface acres.

The remaining analysis of the GIS recreation development suitability maps is presented in four sections: Lake Almanor recreation development suitability, Butt Valley Reservoir development suitability, Belden and Seneca Reaches recreation development suitability, and areas for potential future recreation development.

WHITEWATER BOATING STUDY (E5.2.8)

The Whitewater Boating Study included two "controlled flow" studies to explore specific effects of flows on whitewater boating and fishing, as well as a review of other information about recreational opportunities, hydrology, whitewater boating in the region, and the economic impacts and value of whitewater boating.

Whitewater Boating

Neither the Belden nor the Seneca Reach appears to offer "outstanding" whitewater boating opportunities compared to similar runs in the region or state. While both reaches are likely to receive use if boating flows were made available, use would probably remain lower if other similar segments also had boatable flows (e.g., in the winter or spring). However, the recent high interest shown in Rock Creek-Cresta Project whitewater flows demonstrates at least an initial interest in whitewater boating in the immediate area.

As the two UNFFR reaches are dam-controlled segments, there is potential to offer boatable flows on either reach at times outside the winter/spring seasons when alternative runs are available. It is also possible to coordinate flows on these segments with other dam-controlled segments in the area (e.g., Rock Creek, Cresta, and perhaps Poe) to

provide boatable runs during the off-season. In these situations, either reach is likely to receive considerably higher use, at least initially, as boaters in the region explore the new segments.

Seneca Reach is likely to attract slightly more attention in the boating community than Belden Reach because of its difficulty and because it is a relatively unknown segment of river. However, the reach requires a higher skill level, decreasing the number of boaters who could run it, and there are many other high quality substitute opportunities in the region available during the winter, spring, and early summer. Like the Belden Reach, however, if boatable flows were offered during the warmer summer and early fall months, when other similar segments were not available, there is likely to be increased use on the run. Seneca Reach does not approach the quality of the Middle Fork of the Feather River nor other nearby runs, but it does offer Class V rapids with few portages within a scenic canyon.

Potential whitewater boating flows in the two bypass reaches must ultimately be balanced with the loss of power generation, potential environmental impacts, loss of fishing area, and Forest Service requirements for Special Use Authorization. These trade-offs appear to not favor whitewater boating at this time.

Fishing

As with boaters, anglers were asked to compare the Belden and Seneca Reaches with other rivers in the area, state, and western U.S. to provide a general assessment of their

quality. The Belden Reach is one of the most highly used fishing reaches on the North Fork of the Feather River. However, study results suggest that anglers consider the two reaches even less outstanding for fishing than boaters considered them for boating. Only 33 percent thought Seneca Reach was either better than average or excellent compared to other northern California rivers, and none reported the same for Belden Reach. Results were similar at the state and western regional levels, although 14 to 17 percent noted that Belden Reach was, relatively speaking, better than average.

Diverse Recreation Opportunities

Overall, information in the table below suggests that variation of the hydrograph through the year would provide a greater diversity of high quality recreation than current regimes. Under existing operating conditions, these reaches feature relatively static base flows, with occasional, unpredictable pulses associated with facility maintenance or floods and spills.

In general, the existing flow regime provides optimal fishing opportunities and sub-optimal swimming conditions on Belden Reach; on Seneca Reach, current flow regimes provide sub-optimal but acceptable fly-fishing opportunities.

If stakeholders are interested in increasing the diversity of recreational opportunities, periods of higher flow releases will be necessary. Additional necessary considerations relate to scheduling releases to maximize recreational value while minimizing effects on other recreational opportunities and ecological resources.

Summary of Flows for Recreational Opportunities on Belden and Seneca Reaches

Reach/Opportunity	Flow (cfs)	Comment
Belden Reach		
Aesthetics/General Recreation	60/140	Winter and summer base flows
Fly and Acceptable Spin-/Bait-fishing	175	If one flow provided
Optimal Fly and Spin-/Bait-fishing	150/250	If two flows provided
Tubing	200	Short reaches upstream of campgrounds
Swimming	250	Pools near campgrounds only
Tubing	250	Short reaches near campgrounds
Standard Kayaking	600	If one flow provided
Standard Kayaking and Rafting	750	If one flow provided
Challenge Boating	850	If one flow provided
Standard and Challenge Kayaking	600/850	If two flow provided
Standard and Challenge Kayaking/Rafting	700/900	If two flows provided
Seneca Reach		
Aesthetics/General Recreation	50	Higher than current base flow of 35 cfs
Fly and Spin-/Bait-fishing	125	If one flow provided
Fly and spin/bait-fishing	100/200	If two flows provided
Kayaking (initial years)	400	If one flow provided
Kayaking (after run becomes known)	450	If one flow provided
Kayaking (initial years)	350/450	If two flows provided
Kayaking (after run becomes known)	400/500	If two flows provided

Source: Confluence Research and Consulting.

In conclusion, providing a diversity of recreational opportunities on these two reaches is likely to be challenging. Providing flows for one opportunity may cause some loss in the number of days for another. Ecological resources, such as fish and other aquatic resources, could also be affected. Finally, hydropower generation ability would be affected by potential changes in the flow regime meant to provide greater recreation diversity.

RECREATION NEEDS ANALYSIS SYNTHESIS (E5.2.9)

The primary objective of the Recreation Needs Analysis Synthesis is to identify existing public recreation needs and to project future needs according to increments of time over

the term of the new license. Needs were assessed for both existing and potential developed public recreation facilities and undeveloped dispersed sites within the Project area.

Potential actions addressing existing and future public recreation needs should consider providing a balance between development and natural open space. Maintaining the natural setting of the Project area is an important issue for area residents, visitors, and resource managers. This study is a synthesis of the results of several previous recreation studies conducted as part of the relicensing process.

Previous study results were synthesized into a single report that provides analysis of "big picture" public recreation needs over time, identification of focused public recreation needs on a site-by-site basis for both existing and future sites, and development of Project-related public recreation needs criteria.

Overall Recreation Needs

Results covered the supply, demand, capacity, suitability, and overall needs of the following identified recreation activities throughout the Project area:

- RV and tent camping (at developed and dispersed shoreline sites)
- Day use/picnicking (at developed facilities and dispersed shoreline sites)
- Boating
- Swimming and sunbathing
- Visiting interpretation and education (I&E) facilities/programs/signs
- Non-motorized trail use (including hiking, walking, mountain biking, and

- equestrian use)
- Fishing (boat and bank)
- General use of open space (including hunting and wildlife observation/ photography)

Recreation Needs by Site

Results were also compiled on a site-by-site basis for 17 Level 1 sites owned by either the Licensee or the Forest Service, consisting of campgrounds, boat launches, and day use areas. Less detailed needs analyses were conducted for Level 2 recreation sites and use areas, which included private resorts, private shoreline homes, and dispersed use areas. Level 2 sites and use areas include:

- 18 private resorts, which have a mix of boat launches, marina/slips, and overnight facilities (cabins, RV sites, etc.);
- Lake Almanor shoreline residential boat launches and boat docks/slips (private); and
- Public, Licensee, and other private dispersed (undeveloped) lakeside (Lake Almanor and Butt Valley Reservoir) and riverside (Belden and Seneca Reaches) day use and overnight sites.

Private recreation facilities are considered part of the mix of available recreation opportunities in the Project area; however, the needs associated with private resorts and other facilities are addressed elsewhere in the Draft Shoreline Management Plan.

Additional related recreation studies may also be found in separate sections of Report E5: Recreation Resources. These other studies include: (1) Section E5.6 National Wilderness Areas, Wild and Scenic Rivers, and Trails; and (2) Section E5.7 Economic Impacts of Lake Almanor and Project Recreation Resources. Please refer to these other sections for study results and analysis.

Draft RRMP

Needs identified in this synthesis study were reviewed with the RLA Work Group through a series of meetings in 2002. Additional needs were identified through these consultation meetings. A refined set of needs was converted in a set of proposed recreation PMEs and is presented in the Draft RRMP (Appendix E5-T) and in Section E5.4 Recreation Proposals and Section E5.5 Responsible Parties, Schedules, and Costs.

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E5.2.1 Questionnaire Survey

E5.2.1.1 Overall Introduction

This section presents the results of the Questionnaire Survey, one of several recreation studies that were conducted by the Licensee for relicensing. The objective of this study was to develop recreation user profiles for the Project's recreation areas and most popular primary recreation activity groups. There were four main surveys that were conducted:

- Recreation Visitor Survey;
- Area Resident Survey;
- Recreation-Related Private Business Owner/Operator Survey; and
- Focus Group Interviews.

Response to the visitor survey provided information on demographics, user desired recreational opportunities, facilities, quality of experiences, and satisfaction levels. The survey also covered group characteristics such as number of people and vehicles, visitors' places of residence, lengths of stays, primary trip destinations, recreation areas visited, and primary and secondary recreation activities. Respondents were asked to rate: alternative recreation sites, their satisfaction while participating in primary activities, their satisfaction with the recreation area, and the quality and number of recreation facilities. Questions were also asked about crowding, conflicts and social carrying capacity; and preferred environments for recreating based on Recreational Opportunity Spectrum (ROS) planning concepts.

Visitors were also given an opportunity to provide general comments. This information will be used for planning, designing, and managing recreation sites associated with the Project. Descriptions of the survey approach are provided in Section E5.2.1.4. Similar information was gathered about area residents to ascertain their preferences and concerns about the Project. This information also afforded a comparison of visitors' and residents' attitudes towards the Project area and its management. Descriptions of the resident groups and the survey approach are provided in Section E5.2.1.5.

Selected recreation-related businesses were also surveyed to assess their roles in the Project, and its impact on the businesses. Descriptions of the businesses and the data-gathering process are provided in Section E5.2.1.6. Six focus groups were conducted to obtain information from sources not tapped during survey sampling. Descriptions of focus groups and the data-gathering process are provided in Section E5.2.1.7.

Different survey respondent types and focus group participants were identified as integral components for this survey based on stakeholder, Licensee, and researcher perceptions. Each type and focus was considered crucial to the planning and management of the Project, and collectively they represent the total interests of the community.

Each of these groups received surveys that contained a common set of questions as well as topics pertinent and/or unique to that group. These groups were further subdivided to facilitate analyses of potential differences in reactions to the questions asked.

There were also differences in survey administration and sample stratification, as summarized in Table E5.2.1-1.

Table E5.2.1-1
Summary of Questionnaire Survey Respondents

Respondent Group	Survey Technique	Season/Location[2]
Visitors		***April–October 2001***
Developed Sites	On-site survey and when mailing address was received an additional questionnaire was later sent out. Also, surveys were placed on vehicle windshields when contact could not be made.	Various campgrounds DUAs (DUAs) and boat launch ramps along the shores of Lake Almanor, Butt Valley Reservoir and Belden Reach.
Dispersed Sites *(undeveloped)*		Various locations along the shore of Lake Almanor.
Resort Guests *(privately owned resorts)*		Various resort facilities throughout the Project area.
Residents[1]		***September–December 2001***
Reservoir Shoreline	Questionnaire Mailing	Lake Almanor shoreline including Lake Almanor Country Club, Lake Almanor West, Eastshore and Hamilton Branch.
Reservoir Back-lot		Off Lake Almanor shoreline but nearby.
Towns and Environs		Towns and river reach areas including Crescent Mills, Greenville, Chester, Westwood, Baily Creek, Clear Creek and Canyon Dam
Business Owners		***May–July 2001***
	Questionnaire Mailing	Various business locations throughout and in the vicinity of the Project area
Focus Groups		***September 15–20, 2001***
Teens Seniors and People w/disabilities Anglers Hunters Winter Recreationists Recreational Boaters	Group Meetings/Interviews	All focus group interviews/meetings took place at the Almanor Basin Community Center in Chester.

[1] *Many residents are second home owners*

[2] *During the time of the 2001 surveys, the Lake Almanor pool level was significantly lower than normal due to extreme drought conditions and higher consumer energy demands. These conditions likely affected visitors' responses, who likely reacted to the abnormally low pool levels.*

Source: EDAW, Inc.

E5.2.1.2 Components of the Study

The questionnaire survey is divided into four major sections and a final summary, as shown below.

- Recreation Visitor Survey
- Area Resident Survey
- Recreation-Related Private Business Owner/Operator Survey
- Focus Group Interviews
- Discussion—All Surveys

E5.2.1.3 Overall Survey Study Area

The study area includes all Licensee, United States Forest Service (Forest Service), and privately-owned, developed recreation sites within 0.25 mile of the Federal Energy Regulatory Commission (FERC) Project boundary and along nearby affected river reaches referred to herein as Belden and Seneca Reaches. For research purposes, the study area was divided into four resource areas: Lake Almanor, Butt Valley Reservoir, Seneca Reach, and Belden Reach. The following study area sites are all within one of the four resource areas, as described below. The study area has both public and dispersed recreational areas (see Figures E5.1-1 through E5.1-3).

E5.2.1.3.1 Lake Almanor

Lake Almanor is located in the southeast corner of the Project area at 4,494 feet above sea level (asl) (high pool) (Licensee 2000b). The reservoir offers 27,092 surface acres making it one of the largest lakes in the state, and similar in size to Shasta and Eagle Lakes within the region.

There are approximately 52 miles of shoreline available for recreational use. The Licensee and the Forest Service have provided numerous family and large group camping areas including:

- Lake Almanor Campgrounds (Loops 1, 2, and 3) (Licensee);
- Camp Conery Group Camp (Licensee);
- Last Chance Campground/Group Camp (Licensee); and
- Almanor Campground (Forest Service).

The Licensee and the Forest Service have also provided numerous day use area (DUA) and picnicking facilities at Lake Almanor including:

- Canyon Dam DUA (Licensee);
- Almanor Scenic Overlook (Licensee);
- Eastshore Picnic Area (Licensee);
- Almanor Boat Launch (Forest Service);
- Canyon Dam Boat Launch/DUA (Forest Service) and
- Almanor Rest Area (state route (SR) 89) (Forest Service).

Several private resorts also exist around Lake Almanor. Most of them provide rooms, some have recreational vehicle (RV) spaces or cabins. Most of them have boat launches and some have boat and personal watercraft (PWC) rentals. The private resorts at Lake Almanor (see Figure E5.1-3) are listed below and include:

- Almanor Lakefront Village
- Almanor Lakeside Resort

- Almanor Lakeside Villas
- Big Cove Resort
- Country Club Resorts
- Dorado Inn
- High Sierra Resort
- Knotty Pine Resort
- Lake Almanor Lakeside Lodge
- Lake Almanor Resort
- Lake Cove Resort
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Miller's Resort
- Moonspinners Resort
- North Shore Campground
- Novotny's
- Plumas Pines Resort
- Vagabond Resort
- Villager Resort
- Wilson's Camp Prattville

E5.2.1.3.2 Butt Valley Reservoir

Butt Valley Reservoir is located approximately 4 miles south of Lake Almanor at an elevation of 4,140 feet asl (Licensee 2000b). At maximum pool level, the reservoir has 1,600 surface acres. Opportunities for recreation at Butt Valley Reservoir include camping, fishing, hiking, and swimming. Recreation facilities developed by the Licensee are comprised of two campgrounds on the eastside:

- Ponderosa Flat Campground
- Cool Springs Campground

Cool Springs is a fee campground containing 25 camp units and five walk-in units. It is located 2.5 miles south of Ponderosa Flat Campground on the east shore of Butt Valley Reservoir. Located on the north end of Butt Valley Reservoir, Ponderosa Flat is also a fee campground and contains 63 camp units. There is also a boat launch and DUA at the facility. Powerboats are allowed on the reservoir; however, a Plumas County ordinance does not allow waterskiing nor PWC use (Plumas County Visitors Bureau 1998).

The Licensee also provides a DUA at Butt Valley Reservoir: Alder Creek DUA/Boat Launch.

There are two recreational river reaches on the Upper North Fork of the Feather River (UNFFR) in the Project vicinity. The upper segment, Seneca Reach, begins below Lake Almanor Dam and runs south approximately 11 miles to Caribou Powerhouse 1, just above Belden Forebay.

The lower segment, Belden Reach, begins just below Caribou Powerhouse 1, and runs southwesterly approximately 9 miles to its confluence with the east branch of the UNFFR near SR 70.

E5.2.1.3.3 Seneca Reach

Seneca Reach provides dispersed recreational opportunities such as hiking and fishing. There are also mining operations along the reach. This portion of the UNFFR has restricted access because of the steep, rugged terrain and private in-holdings. There is a county road (CR) that begins at SR 89 near Lake Almanor Dam and leads to the small community of Seneca. There are no services in Seneca. The CR runs parallel to the UNFFR, but is usually well away and above the river in the canyon. Although the river can occasionally be seen from points along the road, access is generally difficult and by foot only. The road is only close to the river as it crosses the bridge in Seneca.

There are also spur roads that approach the river in the middle and lower parts of the reach; these are private mining roads (or roads that cross private property) and it is unclear whether or not recreationists utilize them.

There is a Forest Service-maintained angler trail that travels upstream from Caribou Powerhouses 1 and 2 at the downstream end of the reach. This appears to be well-used and -maintained for the first 3 miles or so, and includes two river footbridges. There are only a few dispersed sites along Seneca Reach, typically used for fishing, such as Skinner Flat.

E5.2.1.3.4 Belden Reach

Belden Reach of the UNFFR is much more accessible than Seneca Reach. The entire length of Belden Reach runs parallel to Caribou Road (which intersects SR 70). The Forest Service operates three campgrounds along this portion of the river and a rest stop nearby on SR 70:

- Gansner Bar Campground
- North Fork Campground
- Queen Lily Campground

Additionally, the Licensee operates Belden Rest Stop in this region at SR 70. Recreational activities in this area include camping, fishing, hiking, and swimming.

E5.2.1.3.5 Dispersed Recreation Areas

Researchers identified 12 dispersed sites within the study area that hosted most of the recreation activity. For descriptive purposes, these sites were placed into two categories: Belden Reach dispersed sites and Butt Valley Reservoir and Seneca Reach dispersed sites. Figure E5.2.1-1—Dispersed Recreation Use Along Roads shows their locations.

Belden Reach dispersed sites begin at the intersection of SR 70 and Caribou Road and stretch upstream to the Caribou Powerhouse parking lot.

The following areas comprise the Belden Reach dispersed sites' geographical range (code numbers from Figure E5.2.1-1 are included in parentheses):

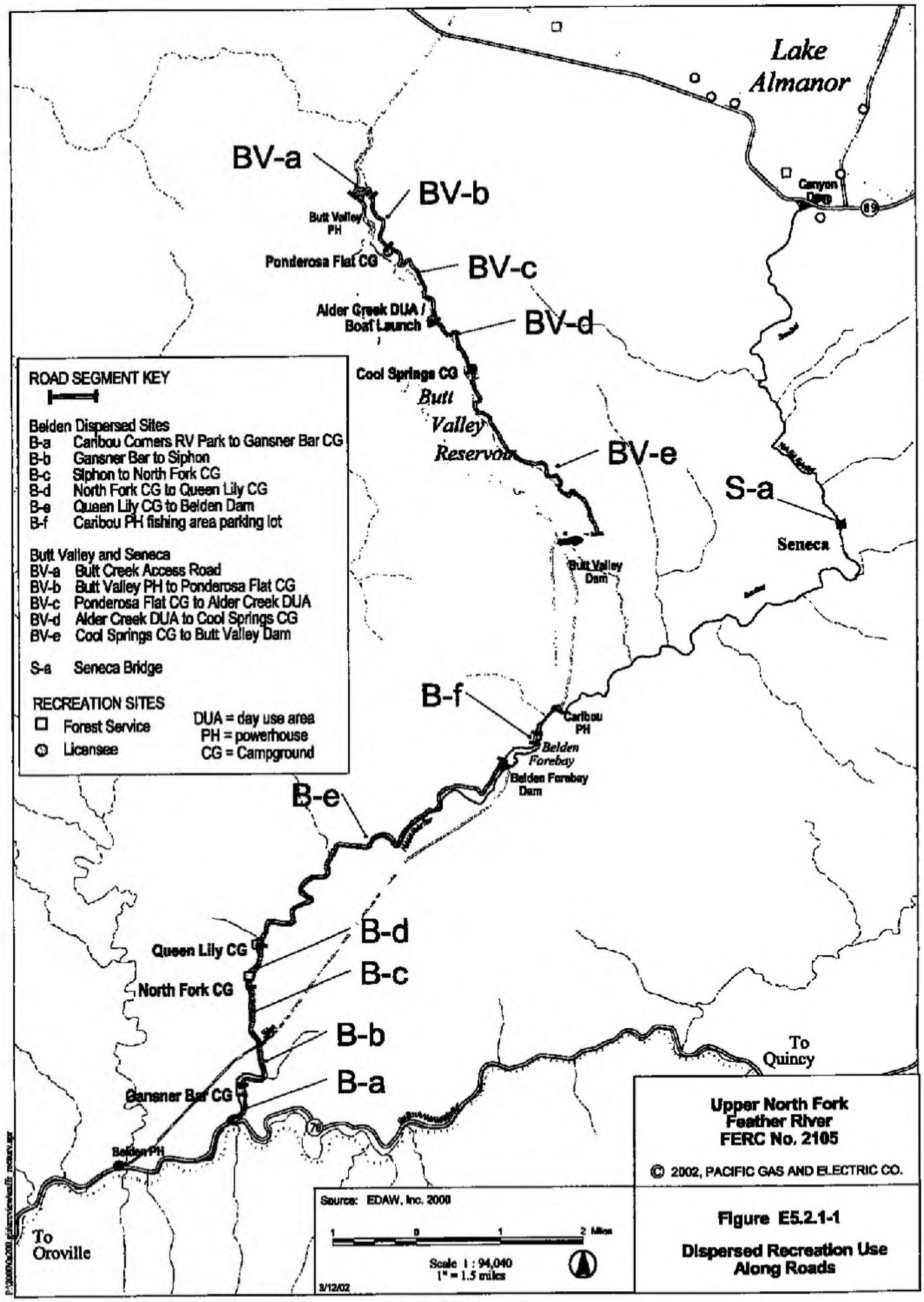
- Caribou Corners RV Park to Gansner Bar Campground (B-a);
- Gansner Bar to Siphon (B-b);
- Siphon to North Fork Campground (B-c);
- North Fork Campground to Queen Lily Campground (B-d);
- Queen Lily Campground to Belden Dam (B-e); and
- Caribou Powerhouse fishing area parking lot (B-f).

All of these areas are located alongside Caribou Road.

Butt Valley Reservoir and Seneca dispersed sites stretch from Butt Creek Access Road to the bridge at the town of Seneca.

The following areas comprise the Butt Valley Reservoir and Seneca Reach dispersed sites' geographical range:

- Butt Creek Access Road (alongside a nameless road between Butt Valley Road and Butt Valley Powerhouse informal parking area) (BV-a);
- Butt Valley Powerhouse to Ponderosa Flat Campground (alongside Butt Valley Road) (BV-b);
- Ponderosa Flat Campground to Alder Creek DUA/Boat Launch (alongside Butt Valley Road) (BV-c);
- Alder Creek DUA/Boat Launch to Cool Springs Campground (alongside Butt Valley Road) (BV-d);



- Cool Springs Campground to Butt Valley Dam (alongside Butt Valley Road) (BV-e);
- Seneca Bridge; and
- Skinner Flat.

E5.2.1.4 Recreation Visitor Survey

E5.2.1.4.1 Introduction

The objective of the Recreation Visitor Survey was to develop recreation user profiles for the Project area's recreation sites and for its most popular primary recreational activity groups. Responses to the questionnaire provided information on demographics, user desired recreational opportunities, facilities, quality of experience, and satisfaction levels.

The survey also covered group characteristics such as: number of people and vehicles, visitors' duration of residence, lengths of stays, primary trip destinations, recreation areas visited, and primary and secondary recreational activities. Respondents were asked to rate: alternative recreation sites; their satisfaction while participating in primary activities; their satisfaction with the recreation area; and the quality and number of recreation facilities. Questions were asked about crowding, conflicts and social carrying capacity, and preferred experience levels using a ROS management setting of the areas visited and those considered visitors' primary resource areas. Visitors were also given an opportunity to provide general comments.

This information will be used for planning, designing, and managing recreational sites associated with the Project.

It is important to acknowledge that when the survey was conducted the pool levels at Lake Almanor were extremely low due to drought conditions and extreme energy demand. These conditions likely contributed to negative visitors' responses related to Lake Almanor pool levels.

E5.2.1.4.2 Methods

E5.2.1.4.2.1 Recreation Visitor Survey Season

Visitors were contacted on randomly selected days at the recreation sites and facilities in the study area during the 2001 recreation season. Sampling was stratified to ensure that a sufficient number of respondents from the early, middle, and late seasons as well as from weekdays, weekends, and holidays were surveyed. This sampling scheme ensured that visitors from different areas of the study area, and from different times throughout the survey season were sampled proportionally. A survey sample schedule and frequency is provided in Table E5.2.1-1.

E5.2.1.4.2.2 Recreation Visitor Survey Tools and Approach

The following section describes the tools and approach used to obtain responses for the on-site survey and mail-back survey of those visitors who provided their addresses.

Contact was made with visitors throughout the Project area to administer an initial on-site visitor survey. Such initial contact provides an efficient way for researchers to obtain the addresses of visitors who use the Project area. Addresses were used to deliver the full follow-up mail survey which generated more useful data than preliminary on-site survey. The follow-up mail survey is too lengthy for visitors to deal with while they are recreating on-site. Visitors would likely refuse to fill out a survey that would take more than 10 minutes and researchers would not get useful information. The follow-up mail survey also lets visitors reflect on their entire trip to the Project area. The on-site survey may be administered to a visitor as they arrive at the Project area, before they experience recreational activities. Both types of survey administration are described below.

In addition to the on-site and follow-up mail surveys, researchers attempted to obtain information from private resort guests, utilizing the strategy for the on-site survey discussed above. Private resort owners/operators who agreed to participate distributed initial on-site surveys to their guests and to those who provided addresses, follow-up mail surveys were administered. This way, information was gathered regarding visitors to DUAs and campgrounds, as well as private resort guests. The following questions are those that were used in the on-site and mail-back surveys. (Not all questions appear in each survey; see also Appendix E5-I—Recreation Survey Instruments).

To maximize on-site response rates, field researchers wore polo-shirt uniforms with the words "Recreation Research" embroidered on them. Name tags with the same designation and the researchers' names were also provided.

The vehicles that were used for site visits had 1-foot by 2-foot door magnets with the words "Recreation Research" in large blue letters on them. Field staff personnel were obtained through a contact at California State University (CSU)—Chico, and were trained in sampling procedures and field survey methodology. The appearance and methods of field staff were designed to yield high response rates from on-site respondents.

E5.2.1.4.2.3 Recreation Visitor Survey Sample Schedule and Frequency

The Recreation Visitor Survey used the sample timeframe detailed in Table E5.2.1-2.

Table E5.2.1-2
Schedule of 2001 Site Visits for the Recreation Visitor Survey

Field Visit	No. of Survey Days	Day of the Week
28-Apr	1	Saturday
11-May	1	Friday
26-May	1	Saturday (Memorial Day Weekend)
2-Jun	1	Saturday
23-Jun	1	Saturday
5-Jul	1	Thursday (Independence Day Weekend)
14-Jul	1	Saturday
21-Jul	1	Saturday
4-Aug	1	Saturday
18-Aug	1	Saturday
1-Sep	1	Saturday (Labor Day Weekend)
8-Sep	1	Saturday
15-Sep	1	Saturday
6-Oct	1	Saturday
Total	14	N/A

Source: EDAW, Inc.

E5.2.1.4.2.4 Recreation Visitor Survey Comparison of Study Plan with Field Sample

The field sample differed only slightly from the study plan in that 14 dates were actually sampled instead of the proposed 15 days. This was due to field logistics, such as staff limitations, and study area sites having no occupancy. The actual sample did hold to the proposed stratified approach, ensuring a sufficient number of respondents from the early, middle, and late seasons as well as from weekdays, weekends, and holidays. For example, during the shoulder seasons, five additional weekend days of surveying were conducted at developed and dispersed sites. Surveying occurred on two weekend days from May 1 to Memorial Day, and three weekend days from Labor Day to October 6.

E5.2.1.4.3 Results

Information was obtained through "mail-in" visitor surveys at three locations—Lake Almanor, Butt Valley, and Belden. At Lake Almanor, 828 surveys were mailed out and 250 were returned for a response rate of 30 percent. At Butt Valley, 235 surveys were mailed out and 133 were returned for a response rate of 57 percent. At Belden, 162 surveys were mailed out and 75 were returned for a response rate of 46 percent.

E5.2.1.4.3.1 Basic Visitor Group and Visit Description

Each heading in this section is followed by a designation that refers to the corresponding survey instrument, where O = on-site survey questions and M = mail-back survey questions (see also Appendix E5-I—Recreation Survey Instruments).

Group Size (O-1)

As shown in Table E5.2.1-3, the median number of visitors to Lake Almanor and Butt Valley Reservoir during the study period was five persons per group, whereas Belden Reach had a median number of four persons per group.

At all three surveyed locations, the majority of respondents had two and five persons in a group. Only 4 percent at Belden Reach, 2 percent at Butt Valley Reservoir, and 3 percent at Lake Almanor had only one person per group.

Table E5.2.1-3
Number of People per Visitor Group

SURVEY QUESTION: How many people in your group today, including yourself, are visiting this area?			
	Lake Almanor	**Butt Valley Reservoir**	**Belden Reach**
Average[1]	9.4/5	6.5/5	5.4/4
	Percent of Groups		
1 Person	3	2	4
2–5 Persons	52	60	66
6–10 Persons	25	24	17
>10 Persons	20	15	14

[1] *Both mean and median figures are provided because means are inflated by large groups*

Source: EDAW, Inc.

Number of Vehicles Used (O-2)

As shown in Table E5.2.1-4, at Lake Almanor, Butt Valley Reservoir, and Belden Reach the median amount of vehicles per group of visitors was 2. Almost four out of every 10 groups surveyed at Lake Almanor and Butt Valley Reservoir said that there was only one vehicle for their group, whereas nearly five out of every 10 visitor groups surveyed at Belden Reach replied that they had one vehicle for their group. Slightly more than half of Lake Almanor day users reported that they had only one vehicle for their group. At all

three locations, those groups travelling with five or more vehicles made up the smallest percentage of visitors.

Table E5.2.1-4
Number of Vehicles per Visitor Group

SURVEY QUESTION: How many vehicles did your group use to come to this area?			
	Lake Almanor	**Butt Valley Reservoir**	**Belden Reach**
Average[1]	3.1/2	2.4/2	2.3/2
	Percent of Groups		
No Vehicle	<1	—	—
1 Vehicle	38	39	48
2 Vehicles	28	30	25
3–5 Vehicles	19	24	21
>5 Vehicles	14	6	6

[1]*Both mean and median are provided because means are inflated by large groups.*

Source: EDAW, Inc.

Visitor Group Activities During Present Visit (O-4)

As shown in Table E5.2.1-5, the activity with the highest overall response from the three resource areas was swimming. Swimming was the top activity for visitors at Lake Almanor (76 percent) Butt Valley Reservoir (83 percent) and at Belden Reach (65 percent). Over eight out of every 10 Butt Valley Reservoir and Belden Reach respondents, and 60 percent of Lake Almanor respondents, said that fishing was an activity they participated in. Nearly six out of every 10 visitors at Butt Valley Reservoir and Belden Reach replied that they took part in wildlife viewing, while approximately 40 percent of Lake Almanor visitors concurred. Similarly, about six in 10 visitors to Butt Valley Reservoir and Belden Reach indicated they participated in sightseeing, as compared to only five in 10 visitors to Lake Almanor.

Table E5.2.1-5
Activity Participation Results

SURVEY QUESTION: Which of the following activities are you and/or members of your group participating in during your visit to this area?			
Activity	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Hiking	46	60	69
Hunting	6	7	3
Swimming	76	83	65
Golf	15	6	2
Sailing	3	8	1.
Horseback Riding	6	2	1
Sightseeing	51	57	60
Wildlife Viewing	43	61	62
Windsurfing	2	5	1
Canoeing	9	22	3
Sunbathing	57	59	51
Fishing	60	83	80
RV Camping	35	35	44
Motorboating	42	30	1
Tent Camping	51	75	63
PWC Use	8	—	1
Picnicking	43	37	48
Kayaking	5	12	2
Bicycling on Roads/Bike Paths	37	36	28
Riding OHVs	9	8	9
Mountain Biking on Trails	16	12	8
Waterskiing	34	—	—
Other	22	14	19

Note: Responses do not sum to 100 percent since this was a multiple response question

Source: EDAW, Inc.

Picnicking was also a relatively frequently mentioned activity at all three resource areas. There were also differences in motorized versus non-motorized boating. About four out of 10 respondents from Lake Almanor participated in motorboating, compared to one in three respondents at Butt Valley Reservoir. In contrast, participation in sailing,

windsurfing, kayaking, and canoeing was higher at Butt Valley Reservoir than at Lake Almanor.

Sunbathing was a common activity for all three locations, as 59 percent of Butt Valley Reservoir, 57 percent of Lake Almanor, and 51 percent of Belden Reach visitors participated.

The activity that the fewest amount of respondents took park in was horseback riding, with only 1 percent of Belden Reach, 2 percent of Butt Valley Reservoir, and 6 percent of Lake Almanor respondents participating. Only 8 percent of Lake Almanor respondents used PWCs. Along with not using PWCs, very few respondents at Lake Almanor (3 percent), Belden Reach (1 percent) and Butt Valley Reservoir (8 percent) said that they participated in sailing while visiting these areas.

Primary, Secondary, Minor Activities (O-5)

Respondents were asked to indicate the top three of 23 activities (primary, second, and third) that their group might participate in. As shown in Table E5.2.1-6, the four most commonly mentioned primary activities at all three resource areas were tent camping (primary activity at Lake Almanor), fishing (primary activity at Butt Valley Reservoir and Belden Reach), swimming, and RV camping. These activities comprise about 57 to 72 percent of respondents' primary activities in these areas.

Motorboating and waterskiing were also found to be relatively important as primary activities at Lake Almanor. These same activities were prominent among respondents' second and third most–preferred activities, nevertheless activities like hiking, wildlife watching, sunbathing, and sightseeing were also frequently mentioned.

Table E5.2.1-6
Visitors' Primary Activities

SURVEY QUESTION: Of the activities you checked above, what are the top three that you're participating in at this area?
[Respondents indicated primary, second, and third activities.]

Activity	Lake Almanor (percent)	Butt Valley Reservoir (percent)	Belden Reach (percent)
Swimming	13	16	9
Fishing	15	29	32
RV Camping	12	12	14
Motorboating	8	<1	<1
Tent Camping	17	26	18
Waterskiing	7	—	—

Note: All activities listed on the questionnaire are not shown. Less than 7 percent of respondents at any of the three resource areas mentioned any of the other16 activities as a primary activity, and most were mentioned by less than 4 percent of respondents.

Source: EDAW, Inc.

E5.2.1.4.3.2 Pattern of Use of Project and Other Northern California Recreation Areas

Each heading in this section is followed by a designation that refers to the corresponding survey instrument, where O = on-site survey questions and M = mail-back survey questions (see also Appendix E5-I—Recreation Survey Instruments).

UNFFR Resource Areas Typically Visited (M-1.1; M-1.2)

When asked which recreation area they most generally visit, 99 percent of Lake Almanor respondents said Lake Almanor, 99 percent of Butt Valley Reservoir respondents said

Butt Valley Reservoir, and 99 percent of Belden Reach respondents said Belden Reach (see Table E5.2.1-7). Over five out of 10 (56 percent) Butt Valley Reservoir respondents also said that they generally visit Lake Almanor as well. One-quarter of those surveyed at Belden Reach also claimed that they generally visit Lake Almanor as well.

The area which was claimed to be visited the least is Belden Reach, as only 6 percent of Lake Almanor, and 5 percent of Butt Valley Reservoir respondents said that they generally visit this recreation area.

Table E5.2.1-7
Project Area Locations Frequented by Users

SURVEY QUESTION: When you make a trip to the UNFFR area, which of the following areas do you generally visit?			
Location	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Lake Almanor	99	56	25
Butt Valley Reservoir	24	99	11
Seneca Reach	8	3	12
Belden Reach	6	5	99

Note: Responses do not sum to 100 percent since this is a multiple response question

Source: EDAW, Inc.

When asked which recreation area they visit most, 96 percent of Lake Almanor respondents said Lake Almanor, 84 percent of Butt Valley Reservoir respondents said Butt Valley Reservoir, and 96 percent of Belden Reach respondents said Belden Reach (see Table E5.2.1-8). Of those who replied regarding Butt Valley Reservoir, 15 percent also said that they visit Lake Almanor the most frequently.

Table E5.2.1-8
Most Frequently Visited UNFFR Area by Users

SURVEY QUESTION: Of the four areas, which resource area do you visit the most?			
Location	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Lake Almanor	96	15	1
Butt Valley	3	84	1
Seneca Reach	—	1	1
Belden Reach	1	—	96

Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Historical Participation in Activities at UNFFR (M-1.3)

When visitors were asked which activity they had ever participated in, the common consensus at all three areas was fishing. Seventy-one percent of Lake Almanor, 83 percent of Butt Valley Reservoir, and 84 percent of Belden Reach respondents indicated that they had fished at these areas (see Table E5.2.1-9). Approximately eight out of every 10 Lake Almanor and Butt Valley Reservoir respondents said they have taken part in swimming, along with 64 percent of Belden Reach respondents. Another activity that obtained high responses was hiking, as 69 percent of Lake Almanor, 65 percent of Butt Valley Reservoir, and 76 percent of Belden Reach respondents said that it was an activity that they have participated in at one time or another. About six out of every 10 respondents from Butt Valley Reservoir and Belden Reach said they have taken part in sightseeing and wildlife viewing, common activities at these resource areas. One-half of Lake Almanor respondents said that they have taken part in wildlife viewing, and 68 percent said that they have gone sightseeing.

The two least frequently mentioned activities at these three resource areas were snowmobiling and cross-country skiing/snowshoeing. Approximately 5 percent of Lake Almanor respondents and only 1 percent of Belden Reach and Butt Valley Reservoir respondents stated that they had ever snowmobiled in the UNFFR area.

Table E5.2.1-9
Project Area User Historical Activity Participation

SURVEY QUESTION: Which of the following activities have you ever participated in at the UNFFR area?			
Activity	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Hiking	69	65	76
Hunting	14	18	5
Swimming	79	83	64
Golf	25	7	1
Sailing	9	16	1
Horseback Riding	12	3	1
Sightseeing	68	61	60
Wildlife Viewing	50	64	63
Windsurfing	4	7	—
Canoeing	15	32	7
Sunbathing	56	64	41
Fishing	71	83	84
RV Camping	51	46	53
Motorboating	55	42	5
Tent Camping	54	75	53
PWC Use	21	—	—
Picnicking	50	40	43
Kayaking	8	13	—
Bicycling on Roads/Bike Paths	51	41	37
Riding OHVs	13	12	8
Mountain Biking on Trails	19	16	12
Waterskiing	42	—	5
Snowmobiling	5	1	1
Cross-country Skiing/Snowshoeing	6	5	3
Other	5	5	9

Note: Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Recent Visitation to Northern California Recreation Areas (M-1.4)

Visitors were asked about what other areas in northern California they visited during the last 12 months. Respondents from all three resource areas tended to have visited major attractions such as Lake Tahoe and Lassen Volcanic National Park, followed by recreation sites on the Plumas and Lassen National Forests (see Table E5.2.1-10).

Table E5.2.1-10
Users' Visits to Northern California Recreation Areas during the Past 12 Months

SURVEY QUESTION: Here is a list of recreation places in Northern California. Indicate the places you have visited for day or overnight recreation ***in the past 12 months.***			
Location	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Lake Almanor	98	68	31
Butt Valley Reservoir	22	100	11
Seneca Reach	8	10	13
Belden Reach	5	10	87
Lake Oroville	20	14	32
Bucks Lake	13	10	23
Eagle Lake	25	11	11
Lake Davis	6	4	3
Little Grass Valley Reservoir	6	5	5
Honey Lake	4	1	—
Lake Britton	5	4	3
Lake Shasta	20	16	23
Lassen National Forest recreation sites	38	30	39
Plumas National Forest recreation sites	26	17	39
Middle Fork Feather River	8	11	28
South Fork Feather River	7	7	17
Sacramento River	22	25	23
Yuba River	4	3	13
Pit River	4	4	5
Lake Tahoe	36	30	27
Trinity Lake	6	5	7
Lassen Volcanic National Park	36	27	28
Other	10	16	12

Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

About one-fifth of respondents from the three resource areas indicated they had visited Lake Shasta.

The areas for which reported visitation was the lowest were Lake Davis, Honey Lake and Pit River. All of these recreation areas received less than a 6 percent response from the three survey groups. Honey Lake received only a 4 percent and 1 percent response from Lake Almanor and Butt Valley Reservoir visitors, respectively, and no responses from Belden Reach visitors.

Favorite Northern California Recreation Areas (M-1.5)

When asked which recreation area was their favorite, visitors' responses mainly focused on the areas at which they were first contacted. Of those surveyed at Lake Almanor, 72 percent said that it was their favorite. Nearly eight out of every 10 (78 percent) Butt Valley Reservoir respondents said that the reservoir was their favorite recreation area, and 48 percent of Belden Reach respondents said the river reach was their favorite area (see Table E5.2.1-11).

The recreation area which received the next highest response was Lake Tahoe, with 8 percent of those from Lake Almanor responding that it was their favorite area, approximately 1 percent of Butt Valley Reservoir respondents claiming it was their favorite area, and 6 percent of Belden Reach respondents stating that it was the best recreation area. Numerous listed recreation areas received no responses from Lake Almanor, Butt Valley Reservoir, or Belden Reach visitors.

Table E5.2.1-11
Users' Favorite Recreation Areas

SURVEY QUESTION: Of the places listed above, which would you say is your favorite?			
Location	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Lake Almanor	72	6	6
Butt Valley Reservoir	2	78	—
Seneca Reach	—	—	3
Belden Reach	—	—	48
Lake Oroville	1	2	3
Bucks Lake	1	1	—
Eagle Lake	3	—	1
Lake Davis	<1	—	—
Little Grass Valley Reservoir	—	1	1
Honey Lake	—	—	—
Lake Britton	1	—	—
Lake Shasta	2	2	—
Lassen National Forest Recreation Sites	1	1	6
Plumas National Forest Recreation Sites	1	2	8
Middle Fork Feather River	—	—	—
South Fork Feather River	—	—	3
Sacramento River	1	1	1
Yuba River	1	—	3
Pit River	—	—	—
Lake Tahoe	8	1	6
Trinity Lake	<1	—	6
Lassen Volcanic National Park	3	2	3
Other	2	5	4
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

Preferred Settings for General Outdoor Recreation (M-1.6)

Of the five settings for general outdoor recreation, there was a rather even split of preferences for "natural and undeveloped areas" versus "developed nature-oriented parks and recreation areas." As shown in Table E5.2.1-12, nearly five out of every 10 respondents from Lake Almanor and Butt Valley Reservoir said that they prefer developed nature-oriented parks and recreation areas.

Table E5.2.1-12
General Outdoor Recreation Setting Preferences

SURVEY QUESTION: What type of setting do you most prefer for general outdoor recreation?			
Questions	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Natural and undeveloped areas	36	49	53
Developed nature-oriented parks and recreation areas	52	48	43
Highly developed parks and recreation areas	4	1	—
Historical or cultural buildings, sites or areas	1	—	—
Private, outdoor recreation areas and facilities	7	2	4
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

Approximately four out of every 10 persons surveyed from Belden Reach had the same response. About one-half of Butt Valley Reservoir respondents (49 percent) and Belden Reach respondents (53 percent) felt that natural and undeveloped areas were the settings they prefer, yet only 36 percent of those surveyed from Lake Almanor responded this way. Historical or cultural buildings, sites or areas, was the least preferred setting of visitors to all three resource areas.

Factors in Visitors' Choice to Visit Project Area (M-2.1)

Seventy-six percent of Lake Almanor visitors, 81 of Butt Valley Reservoir visitors, and 67 percent of Belden Reach visitors feel that their respective chosen resource areas are special to them (see Table E5.2.1-13).

Table E5.2.1-13
Influence of Resource Conditions on Visits to the Study Area

SURVEY QUESTION: How important are each of the following reasons for you to visit the survey area for outdoor recreation, rather than another recreation area?

(N = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree)

Questions	Lake Almanor (percent)						Butt Valley Reservoir (percent)						Belden Reach (percent)					
	N	1	2	3	4	5	N	1	2	3	4	5	N	1	2	3	4	5
It's close to home	9	13	7	14	22	35	8	20	11	19	14	27	3	15	8	16	20	39
The fishing is better than other areas	28	3	6	29	21	13	12	8	14	33	19	13	15	9	5	20	20	31
The scenery is better	5	1	2	11	33	48	3	2	2	10	29	55	5	1	1	12	36	44
The camping is better	10	1	4	21	27	37	—	2	5	13	27	54	3	1	3	12	32	49
The water quality is better than other areas	11	3	5	21	29	31	5	3	3	26	27	36	8	1	1	29	33	27
This recreation area has better trails	17	1	3	33	31	17	14	5	10	46	21	5	13	—	7	47	23	11
This recreation area is a special place for me	8	1	1	14	18	58	4	2	—	14	18	63	7	3	3	21	19	48
This recreation area is quieter and more peaceful	8	2	4	14	29	44	—	1	6	6	20	67	8	3	5	11	28	45
I like that this recreation area is stocked with fish	22	2	7	27	23	20	18	9	5	21	19	29	15	4	7	15	15	45
I like the speed limit at this recreation area	17	2	3	36	18	24	8	4	3	17	8	61	N/A					
Easy access to shore for fishing	22	2	4	24	27	21	11	3	2	19	29	36	12	1	9	11	27	40
It is easy to get to	8	1	6	12	34	38	5	2	7	12	29	46	4	—	5	11	25	55
This recreation area has more day use opportunities	14	1	4	32	29	20	9	5	10	39	23	14	11	—	12	31	32	15
The recreation area offers the best combination of activities	8	1	3	23	29	37	6	2	4	31	33	24	8	1	4	25	33	28
I can find a campsite at this recreation site when other places are full	16	5	14	29	26	11	5	6	12	21	34	21	12	7	19	15	25	23
Other (*describe*)	93	1	—	1	1	5	89	—	—	—	1	10	93	—	1	—	1	4

Source: EDAW, Inc.

Just over four out of every 10 visitors to Lake Almanor and Belden Reach agree or strongly agree that their recreation area is quiet and peaceful, while almost seven out of every 10 visitors to Butt Valley Reservoir felt the same. About eight in 10 of those surveyed at Lake Almanor agree or strongly agree that the scenery was better than other areas, while 84 percent of Butt Valley Reservoir respondents, and 80 percent of Belden Reach respondents agreed. Of the respondents from Lake Almanor, 64 percent agreed or strongly agreed that the camping there was better than at other areas and was an important factor in their choice of Lake Almanor. Eighty-one percent of both Butt Valley Reservoir and Belden Reach survey respondents felt the same way about the two recreation areas.

Of the respondents at Lake Almanor, 72 percent agreed or strongly agreed that the area's easy accessibility influenced their choice of the site. Eight out of 10 respondents at Belden Reach, and three-quarters of the respondents at Butt Valley Reservoir felt that accessibility was an important factor influencing their choice of recreation areas.

E5.2.1.4.3.3 Perceptions of Crowding at Project Area Resource Areas

Overall Perceptions of Crowding During Current Visit (O-6; O-7)

Visitors to Lake Almanor, Belden Reach and Butt Valley Reservoir were asked to rate, on a 1–9 scale range, from least to most crowded (Shelby and Heberlein 1986) how crowded they felt that their resource area was (see Table E5.2.1-14).

Table E5.2.1-14
Perceptions of Crowding at Resource Areas

SURVEY QUESTION: How crowded do you feel at the resource area you are currently visiting?			
Crowding Scale	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Mean score	3.4	4.1	3.8
1 (Not at all crowded)	29	19	26
2	16	16	16
3 (Slightly crowded)	17	15	15
4	5	7	6
5	7	7	6
6 (Moderately crowded)	14	22	13
7	5	6	6
8	3	4	6
9 (Extremely crowded)	4	5	7

Source: EDAW, Inc.; Shelby and Heberlein 1986

Nearly one out of three respondents (29 percent) from Lake Almanor, 26 percent at Belden Reach and 19 percent at Butt Valley Reservoir felt that they were not at all crowded (rating 1).

Only 4 percent of Lake Almanor, 5 percent of Butt Valley Reservoir and 7 percent of Belden Reach respondents felt that they were extremely crowded (rating 9). Over one-half of the visitors surveyed at Belden Reach and Butt Valley Reservoir gave either a 1, 2, or 3 rating, and over 60 percent of Lake Almanor respondents felt only slightly to not

at all crowded, giving either a 1, 2, or 3 rating (1=not crowded at all; 9=extremely crowded).

At all three locations surveyed, the majority of people (approximately 50-60 percent) felt that the amount of crowding present was what they expected to experience. Less than one-third of those surveyed at the three locations felt that it was less crowded than what they expected. As shown in Table E5.2.1-15, only 11 percent of Lake Almanor, 14 percent of Belden Reach and 22 percent of Butt Valley Reservoir respondents felt that the resource area was more crowded than what they expected to experience.

Table E5.2.1-15
Comparison of Crowding Perceptions with Expectations

SURVEY QUESTION: How would you compare the level of crowding today with what you expected to experience?			
Crowding Level Expectation	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Less crowded	33	22	19
About as I expected	50	52	63
More crowded	11	22	14
I didn't know what to expect	6	4	3

Source: EDAW, Inc.

Perceptions of On-Water Crowding (O-8)

Visitors at each of the three resource areas felt slightly crowded while on Project area waterbodies. Visitors were asked to rate their experience of crowding on a 1–9 scale range (from least to most crowded). The mean response was at or near 3 on the scale for all three resource areas (see Table E5.2.1-16). The highest response came from Belden

Reach visitors (3.4), while the mean score of 2.7 at Lake Almanor Segment A was the lowest.

Table E5.2.1-16
Perceptions of On-Water Crowding

SURVEY QUESTION: If you participated in activities on the water today, indicate how crowded you felt on the sections listed. If you were not in one of these areas today, mark "N/A".						
Crowding Scale	**Lake Almanor Segments (percent)**				**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
	A	**B**	**C**	**D**		
Mean score	2.7	2.9	3	3.2	2.8	3.4
1 (Not crowded at all)	8	12	9	15	39	15
2	2	7	6	9	18	13
3 (Slightly crowded)	4	6	3	7	11	11
4	1	2	3	3	4	4
5	1	3	2	3	4	3
6 (Moderately crowded)	1	3	3	6	9	7
7	<1	2	1	2	2	1
8	<1	<1	1	2	3	3
9 (Extremely crowded)	<1	<1	<1	1	2	2
N/A	82	66	72	53	9	39

Sources: EDAW, Inc.; Shelby and Heberlein 1986

Effect of Number of People on Visitors' Enjoyment (M-2.2)

The effect of the number of people on visitors' enjoyment varied by resource area. Respondents from Belden Reach were the most sensitive to the number of people, followed by respondents from Butt Valley Reservoir, and then Lake Almanor. In contrast, substantial portions (30–43 percent) of all three groups indicated that the number of people present had no effect on how much they enjoyed their visits (see Table E5.2.1-17).

Table E5.2.1-17
Effect of Use Level on Visitor's Enjoyment

SURVEY QUESTION: Please indicate the extent to which the number of people present at this recreation area affects your overall enjoyment of your visit. In general, the amount of use at this recreation site...			
Survey Questions	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Adds a lot to my enjoyment	18	19	18
Adds a little to my enjoyment	8	8	5
Detracts a little from my enjoyment	25	30	31
Detracts a lot from my enjoyment	6	9	16
Doesn't really affect my enjoyment one way or another	43	33	30
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

One-fourth of the people surveyed at Lake Almanor felt that the number of people present detracted a little from their enjoyment, while approximately three out of every 10 persons at Butt Valley Reservoir and Belden Reach responded in the same way. Nearly two out of every 10 people felt that the amount of people present actually adds a little to their enjoyment.

Changes Made in Visit Timing and Location Due to Crowding (M-2.3)

Coinciding directly with the effect of the number of people present, 57 percent of Lake Almanor visitors, 50 percent of Butt Valley Reservoir visitors, and 49 percent of Belden Reach visitors stated that they have never changed their visits due to crowding (see Table E5.2.1-18). At the same time, many visitors use varied coping skills to avoid crowding during their visits.

Table E5.2.1-18
Changes in Visitation Due to Crowding

SURVEY QUESTION: Have you ever changed your visits to this recreation area because of crowding?			
Survey Questions	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
No	57	50	49
I sometimes visit this recreation area earlier or later in the year to avoid crowds	24	31	44
I sometimes visit this recreation area on weekdays to avoid weekend crowds	25	30	35
I sometimes avoid holiday weekends	29	32	47
I try to find quiet places on the lake to avoid crowded locations	20	24	31
I sometimes come earlier or later in the day to avoid busy times	14	19	27
I sometimes go to other places in northern California when this recreation area is too crowded	12	19	17
I sometimes camp at another campground when sites at this recreation area's sites are full	13	16	23
I sometimes camp at undeveloped campsites along roads when this recreation area's campgrounds are full	8	6	21

Note: Responses do not sum to 100 percent since this is a multiple response question

Source: EDAW, Inc.

Nearly three out of every 10 surveyed at Lake Almanor and Butt Valley Reservoir, as well as almost five out of every 10 surveyed at Belden Reach said that they sometimes avoid holiday weekends because of crowding. A quarter of those surveyed at Lake Almanor sometimes visit on weekdays to avoid weekend crowds, with 30 percent and 35 percent of Butt Valley Reservoir and Belden Reach respondents concurring. Very few respondents at Lake Almanor (8 percent) and at Butt Valley Reservoir (6 percent) camped at undeveloped campsites when their intended recreation area was full.

However, about one in five of Belden Reach respondents sometimes camped at undeveloped sites.

E5.2.1.4.3.4 Summary of Group Characteristics and Visit Descriptions

Survey results support the concept of three distinct resource areas, offering different recreational settings and opportunities. For example, activity participation results indicate motorboating and PWC use are most popular at Lake Almanor. In contrast, non-motorized water-related activities such as canoeing and sailing are more popular at Butt Valley Reservoir where PWC use and waterskiing are prohibited by county ordinance.

Similarly, wildlife viewing is more popular at Butt Valley Reservoir and Belden Reach than at Lake Almanor. Finally, setting preferences differ among the respondents from these three areas. About half of the respondents at Butt Valley Reservoir and Belden Reach stated that natural and undeveloped areas are their preferred settings, compared to only about one-third (36 percent) of respondents at Lake Almanor.

Those that go to Lake Almanor or Butt Valley Reservoir are looking for a different experience than those who utilize Belden Reach. Boating, either motorized or non-motorized is a common activity at Lake Almanor and Butt Valley Reservoir, while on-water activities at Belden Reach are limited to small-scale, river-related recreation. Along with seeking various experiences at Project area recreation sites, visitors also expect varying amounts of crowding. Recreationists at Belden Reach expect a relatively

uncrowded area, while those heading to Lake Almanor or Butt Valley Reservoir assume that there will be others sharing the available recreation areas.

E5.2.1.4.3.5 Visitors' Perceptions of Resource, Managerial, and Social Conditions

Recreational opportunities are in large part determined by the setting in which they are provided. The setting is defined by a set of environmental/natural resource, social, and managerial conditions. Natural resource conditions include natural features, environmental impacts and quality, and degree of naturalness. Social conditions include the number of other visitors as well as their characteristics and behavior. Managerial conditions include access and facilities, regulations, management policies, and enforcement of policies and regulations.

In preceding sections of this report results related to visitors' perceptions of social conditions in terms of crowding, and the influence of various conditions on choice to visit the Project area have been discussed. The following section provides results from several additional survey questions about visitors' perceptions of and preferences for conditions.

These results include:

- Opinions on aspects of the facilities and services provided;
- Behavior of and interactions with other visitors;
- Resource attributes that are problematic;
- Opinions on the effect of water levels on enjoyment and safety;
- Degree of support for facility additions and regulation and fee changes; and
- Opinions regarding the amount of specific facilities and services provided.

Each heading in this section is followed by a designation that refers to the corresponding survey instrument, where O = on-site survey questions and M = mail-back survey questions (see also Appendix E5-I—Recreation Survey Instruments).

Perceptions of Problems with Conditions (M-2.4)

Respondents were asked to indicate if a series of items were "not a problem" or "a slight," "moderate," or "big" problem. Visitors to the three study areas differed significantly in their perceptions. The main issues at Lake Almanor, based on the percentages who considered them moderate or big problems, were centered on water level.

Specifically, water level fluctuations (42 percent), exposed land during lower water levels (43 percent), and shallow areas during lower water levels (42 percent) were considered the biggest problems (see Table E5.2.1-19). About 22 percent of respondents considered these to be big problems while no other issue was considered such by more than 6 percent of respondents.

Although most other items were considered to be moderate or big problems by 10 percent or fewer of the respondents, somewhat greater concern was registered about a few items related to social conditions. From 18 percent to 20 percent of the respondents from all three resource areas considered the number of people at developed facilities, the ability to find a campsite, and interaction between PWC users and other users moderate or big problems.

Table E5.2.1-19
Extent of Problems Encountered

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.

(N= Not Applicable/No Answer; 1= Not a Problem; 2=A Slight Problem; 3= A Moderate Problem; 4 = A Big Problem)

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)					Belden Reach (percent)				
	N	1	2	3	4	N	1	2	3	4	N	1	2	3	4
Ability to access the public shoreline	13	63	9	9	6	2	86	7	1	4	13	65	12	7	3
Development on or near the shoreline/riverbank	15	52	17	12	4	19	74	3	2	2	25	63	8	4	—
Litter around the lake shoreline/riverbank	9	56	26	8	1	2	71	18	6	3	15	43	20	12	11
Sanitation around the lake shoreline/riverbank	12	61	18	6	3	5	73	13	6	3	21	40	16	17	5
Cost to use facilities	8	57.	20	12	4	2	48	20	14	16	7	65	19	8	1
Numbers of people at developed facilities	10	46	27	14	4	5	52	28	14	2	12	35	32	11	11
Ability to find a picnic table	23	51	17	6	3	23	62	9	4	2	21	52	15	7	5
Ability to find a campsite	18	36	26	17	3	3	49	30	13	5	7	32	37	16	8
Amount of convenient parking	11	56	20	11	3	2	70	12	11	5	11	59	20	9	1
Numbers of watercraft on the lake	12	59	21	6	2	3	88	5	3	1	Item not included				
Noise from boats and personal watercraft	8	61	19	7	5	1	85	9	3	2	Item not included				
Boat speed or wake effects	10	60	21	6	3	3	83	8	3	2	Item not included				
Ability to launch a boat or watercraft	25	54	10	6	4	20	66	8	5	1	Item not included				
Wait times to launch a boat or watercraft	28	56	11	3	1	21	74	4	1	—	Item not included				
Behavior by other users	8	57	27	7	2	4	67	20	7	3	11	52	25	8	4
Use of alcohol by other users	12	60	22	6	1	5	70	12	8	5	9	64	16	7	4
Interaction between water skiers and other users	19	60	16	5	1	Item not included					Item not included				
Interaction between visitors and residents	17	72	8	3	1	Item not included					20	76	4	—	—
Interaction between boaters and anglers	22	57	15	4	1	24	71	4	2	—	Item not included				
Interaction between horse riders and other users	38	60	1	1	1	42	55	2	—	1	57	43	—	—	—

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.

(N= Not Applicable/No Answer; 1= Not a Problem; 2=A Slight Problem; 3= A Moderate Problem; 4 =A Big Problem)

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)					Belden Reach (percent)				
	N	1	2	3	4	N	1	2	3	4	N	1	2	3	4
Boat-in use of the undeveloped shoreline areas	34	55	7	3	1	30	65	3	2	1	Item not included				
Water level fluctuations	12	28	19	20	22	7	42	33	11	8	27	60	9	3	1
Exposed land during lower water levels	9	23	24	20	23	8	55	24	5	7	33	55	9	1	1
Shallow areas during lower water levels	11	24	23	20	22	7	55	26	5	7	32	57	7	3	1
Floating debris in the water	10	55	25	8	2	5	64	20	7	4	Item not included				
Overall safety and security	7	73	15	4	1	3	84	8	4	1	8	85	4	3	—
Traffic and congestion on nearby roads	7	79	14	1	1	2	89	7	2	1	7	73	16	4	—
Adequate protection from the wind	9	71	12	6	1	2	55	30	6	8	Item not included				
Adequate information/warnings provided	14	73	7	4	3	10	80	7	2	1	7	89	3	—	1
Trespass on private property	28	62	8	1	1	24	71	3	1	2	29	64	7	—	—
Inundated areas during high water levels	27	61	10	1	1	3	89	7	2	—	Item not included				
Quality of water in lake	11	74	11	3	2	15	68	9	4	4	Item not included				
Gates and other development blocking foot access to the public shoreline/riverbank	19	57	14	8	3	13	75	7	2	3	32	57	5	1	4
Amount of private residents' ownership of the shoreline	18	49	16	12	5	Item not included					Item not included				
Interaction between PWCs (jet-skis/waverunners) and other users	17	47	17	13	6	Item not included					Item not included				

Note: "Item not included" indicates that item was deleted from the mail questionnaire for that resource area

Source: EDAW, Inc.

At Butt Valley Reservoir the most recognized problem was the cost to use the facilities, with 30 percent perceiving this as a moderate or big problem. Similar to Lake Almanor visitors, ability to find a campsite and water level fluctuations were considered moderate or big problems by 18 percent and 19 percent of respondents, respectively.

The issues that were considered the largest problems at Belden Reach were the amount of convenient parking (24 percent), litter along the riverbank (23 percent), sanitation along the riverbank (22 percent), and the number of people at developed facilities (22 percent).

Effect of Water Levels on Enjoyment and Safety (Q 9-10)

At Belden Reach and Butt Valley Reservoir, 44 percent and 58 percent of respondents respectively, felt that the water level was totally acceptable (see Table E5.2.1-20). Only 15 percent of Lake Almanor respondents found that water levels were totally acceptable. Only 4 percent of Butt Valley Reservoir and 5 percent of Belden Reach respondents felt that water levels were totally unacceptable. For Lake Almanor recreationists surveyed in 2001, a much higher proportion of respondents (13 percent) felt that lake levels were totally unacceptable. It is important to note that during the time of the surveys (spring/summer 2001), the Lake Almanor pool level was significantly lower due to reduced precipitation causing drought conditions and higher consumer energy demands that exceeded availability, thereby causing the need for additional power production to avoid power outages.

Table E5.2.1-20
Users' Perceptions of Effects of Water Levels on Enjoyment

SURVEY QUESTION: How would you rate the lake or river water level today in terms of how it affected your ability to enjoy lake and river-related recreation activities?			
Water Level Acceptance	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Totally acceptable	15	56	42
Moderately acceptable	14	11	19
Neutral	18	15	19
Moderately unacceptable	29	9	9
Totally unacceptable	13	4	5
Doesn't apply to me	6	1	4

Source: EDAW, Inc.

As shown in Table E5.2.1-21, almost half of the visitors surveyed at Belden Reach (44 percent) and slightly more than half at Butt Valley Reservoir (58 percent) felt that water levels were totally acceptable for safety. On the other hand, only 17 percent of those responding from Lake Almanor felt that the water level was totally acceptable for safety purposes. The Lake Almanor survey shows results that are spread throughout the entire spectrum of water level acceptance from totally acceptable to totally unacceptable.

At Belden Reach and Butt Valley Reservoir the vast majority of responses (81 percent and 86 percent respectively) were either neutral or acceptable about safety of the water levels, and only 4 percent and 6 percent, respectively, felt that the water levels were totally unacceptable for safety purposes.

Table E5.2.1-21
Users' Perceptions of Effects of Water Levels on Safety

SURVEY QUESTION: How would you rate the lake or river water level today in terms of how safe it is to use for recreation?			
Water Level Acceptance	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Totally acceptable	17	58	44
Moderately acceptable	17	15	17
Neutral	20	13	20
Moderately unacceptable	23	5	6
Totally unacceptable	10	4	6
Doesn't apply to me	8	2	5

Source: EDAW, Inc.

Potential Improvements in Facilities and Services (M-3.1)

The possible development option that received the greatest level of support was to provide electric hookups for campers.

Nearly one-half of Lake Almanor, 38 percent of Butt Valley Reservoir, and 35 percent of Belden Reach respondents supported the idea (see Table E5.2.1-22). Installing more pay telephones in campgrounds received the highest level of support from respondents at Butt Valley Reservoir (49 percent), and Belden Reach (43 percent). Creating more day use facilities and creating no-wake zones also received high levels of support from Lake Almanor respondents.

The development option that received the lowest amount of support was eliminating alcohol use in the campgrounds. There were more people opposing this option versus supporting it, as the mean rating for this suggestion was 2.6 for Lake Almanor, 1.8 for Butt Valley Reservoir, and 2.1 for Belden Reach survey respondents.

Table E5.2.1-22
Users' Opinions of Possible Developments at Recreation Area

SURVEY QUESTION: How much do you support or oppose each of the following possible developments at this recreation area?

1 = Strongly Oppose and 5 = Strongly Support. Thus, a mean score of 3 would indicate an overall "neutral" opinion on an item. Percent support indicates responses of 4 or 5.

Development	Lake Almanor		Butt Valley Reservoir		Belden Reach	
	Mean Rating	Percent Support	Mean Rating	Percent Support	Mean Rating	Percent Support
Create more day use facilities around the lake	3.2	39	2.3	17	2.7	31
Create more commercial overnight moorage docks	2.9	21	1.9	11	N/A	
Install more pay telephones in campgrounds	3.4	36	3.4	49	3.2	43
Create no-wake zones on the lake	3.4	46	3.2	35	N/A	
Eliminate alcohol use in the campgrounds	2.6	26	1.8	11	2.1	16
Provide electric hookups for campers	3.5	49	2.8	38	2.9	35
Charge a fee for day use hookups at area sites	2.5	20	2.5	26	2.8	30
Other	3.3	45	4.3	85	4.1	86

Source: EDAW, Inc.

Evaluation of Current Facilities and Services (M-3.2)

The adequacy of shower facilities at campgrounds was an issue which Lake Almanor and Butt Valley Reservoir respondents felt needs to be addressed. Three-quarters of Lake Almanor respondents, along with 84 percent of Butt Valley Reservoir respondents felt that there were not enough shower facilities at the campgrounds (see Table E5.2.1-23).

Along with not having enough showers at campgrounds, 69 percent of those at Lake Almanor, and 62 percent of those at Butt Valley Reservoir felt that there were not enough

Table E5.2.1-23
Users' Evaluation of Current Developments and Services at Recreation Area

SURVEY QUESTION: How do you evaluate the number or amount of each of the following developments or services at this recreation area?

Development	Lake Almanor		Butt Valley Reservoir		Belden Reach	
	Mean Rating	Percent	Mean Rating	Percent	Mean Rating	Percent
Number of boat ramps	3.5	34	3.2	14	N/A	
Number of docks or temporary moorage	3.6	42	3.4	21	N/A	
Number of restrooms around the shoreline	3.7	47	3.3	20	N/A	
Number of campgrounds	3.6	43	3.2	19	3.4	28
Presence of campground hosts	3.2	15	3	9	2.9	3
Number of boat-in campsites	3.5	37	3.3	22	N/A	
Number of campsites with RV hookups	3.8	52	3.8	52	3.4	44
Amount of parking along roads	3.7	43	3.4	28	3.5	31
Law enforcement presence	3.5	36	3.4	29	3.6	42
Cost of campsites[a]	2.5	39 [a]	2.1	55 [a]	2.7	29 [a]
Number of paved bike trails	3.4	33	3.6	40	3.6	42
The number of mountain bike trails	3.5	42	3.4	35	N/A	
Number of hiking trails	3.5	34	3.5	35	3.7	47
Number of equestrian facilities	3.3	22	3.2	19	3.4	36
Number of Marinas	3.4	32	N/A		N/A	
Number of group campsites	3.4	33	3.4	27	3.7	49
Number of signs indicating trail locations	3.4	33	3.8	55	4	57
Amount of public access areas on shoreline	3.6	38	3.3	23	N/A	
Amount of screening between campsites	3.5	40	3.9	54	4	66
Number of developed day use or picnic areas around the shore	3.6	41	3.3	26	3.6	40
Number of interpretive programs/educational opportunities	3.6	43	3.6	48	3.7	50
Boat-in gas stations	3.6	44	N/A		N/A	
Fish cleaning stations	3.8	50	4	62	N/A	
Shower facilities at campgrounds	4.3	75	4.6	84	N/A	
Shower facilities at day use areas	4.2	69	4.1	62	N/A	
Boat-in primitive campsites	3.7	50	3.7	48	N/A	
Drive-in primitive campsites	3.6	46	3.6	40	N/A	
Shade tree areas	3.4	30	3.4	31	N/A	
Group picnic sites	3.4	30	3.4	27	N/A	
Other (items added by respondents)	5	100	4.6	89	—	—

Notes: The rating system was based on the following scale: 1 = Too High, 3 = About Right, 5 = Too Low.

Percent columns indicate responses of 4 or 5 (i.e., on the "Too Low" side of the scale). Mean ratings and percents do not include N/A responses and non-responses.

[a]These percent values, opposite of those given for all other items, indicates responses of 1 or 2 (i.e., the "Too High" side of the scale) which are judged to be more meaningful responses for this item.

Source: EDAW, Inc.

showers at day use facilities. There are no DUAs with showers at Belden Reach sites, therefore the issue of adding showers at DUAs was not applicable.

Belden Reach sites do not have fish cleaning stations, yet one-half of those from Lake Almanor, and 62 percent of those at Butt Valley Reservoir, felt that additional fish cleaning stations are needed at their recreation areas.

Nearly two-thirds of Belden Reach respondents felt that the amount of screening between campsites is too low, whereas one-half of those from Butt Valley Reservoir and four out of 10 from Lake Almanor responded in the same manner.

A majority of Belden Reach respondents (57 percent) felt the number of signs indicating trail locations needed the most improvement. One-third of Lake Almanor respondents, and 55 percent of Butt Valley Reservoir respondents also felt that this issue needs to be addressed.

The cost of campsites was the only service that survey respondents felt was too expensive. The mean rating for this issue ranged from 2.1 for Butt Valley Reservoir respondents, 2.5 for Lake Almanor, to 2.7 for Belden Reach respondents.

E5.2.1.4.3.6 Demographic Information on UNFFR Visitors

Each heading in this section is followed by a designation that refers to the corresponding survey instrument, where O = on-site survey questions and M = mail-back survey questions (see also Appendix E5-I—Recreation Survey Instruments).

Gender (M-5.1)

At Lake Almanor, Butt Valley Reservoir, and Belden Reach there was a rather close split between male and female visitors. At Lake Almanor and Butt Valley Reservoir there was a higher percentage of male to female visitors, whereas Belden Reach had a higher amount of females (see Table E5.2.1-24).

Table E5.2.1-24
UNFFR Recreation Area Visitor Gender

SURVEY QUESTION: Are you male or female?			
Gender	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Male	57	59	49
Female	44	41	51

Source: EDAW, Inc.

Age (M-5.2)

As shown in Table E5.2.1-25, the mean average age of respondents from Lake Almanor, Butt Valley Reservoir and Belden Reach was approximately 50 years-old. Nearly one half of Lake Almanor and Butt Valley Reservoir respondents were between 30–49 years-old, whereas only 29 percent of Belden Reach respondents fell in this age range.

Table E5.2.1-25
UNFFR Recreation Area Visitor Age

SURVEY QUESTION: What is your age?			
	Lake Almanor	**Butt Valley Reservoir**	**Belden Reach**
Mean Average	50	49	51
	Percent of Respondents		
<30 years	7	9	10
30–49 years	48	46	29
50–69 years	37	34	56
70+ years	8	12	6
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

The majority of Belden Reach recreationists (56 percent) were between the ages of 50–69 years-old. Lake Almanor and Butt Valley Reservoir respondents between the ages of 50–69 represented 37 percent and 34 percent respectively.

Education (M-5.3)

As shown in Table E5.2.1-26, the majority of respondents from Lake Almanor (38 percent), Butt Valley Reservoir (49 percent), and Belden Reach (43 percent) have had some college education. About one in five (23 percent) of those responding to the survey from Lake Almanor have obtained BA/BS degrees. Similarly, 31 percent of Butt Valley Reservoir, and 18 percent of Belden Reach respondents have obtained BA/BS degrees. At Lake Almanor, approximately 15 percent have obtained either MA or MS degrees, or were high school graduates only. Belden Reach had similar results: 18 percent of respondents have MA/MS degrees, while 21 percent have high school diplomas only.

Table E5.2.1-26
Recreation Area User Education

SURVEY QUESTION: What is the highest level of education you have completed?			
	Lake Almanor (percent)	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Some High School	4	1	—
High School Graduate	16	11	21
Some College	38	49	43
BA/BS	23	31	18
MA/MS	15	4	18
Ph.D./JD/MD	4	4	1
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

Butt Valley Reservoir survey results were farther apart, as only 4 percent have MA/MS degrees, while 11 percent have high school diplomas only. Having Ph.D./JD/MD degrees, or only some high school education were the categories with the lowest response (less than 5 percent at all locations).

Income (M-5.4)

As shown in Table E5.2.1-27, the total household income before taxes of those responding from either the Lake Almanor, Butt Valley Reservoir, or Belden Reach resource areas was very evenly distributed between $20,000 and over $100,000 annually. Respondents at Lake Almanor had higher incomes than those at the Butt Valley Reservoir and Belden Reach, with 38 percent having an income of over $80,000. Twenty-eight percent of Butt Valley Reservoir, and 32 percent of Belden Reach respondents also had the latter level of income.

Table E5.2.1-27
UNFFR Recreation Area User Average Annual Household Income

SURVEY QUESTION: Please mark the category that represents your total household income before taxes.			
Income	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**	**Belden Reach (percent)**
Less than $20,000	6	4	4
$20,000 – $40,000	19	19	24
$40,000 – $60,000	19	30	23
$60,000 – $80,000	17	19	17
$80,000 – $100,000	18	12	13
More than $100,000	20	16	19
TOTALS	**100**	**100**	**100**

Source: EDAW, Inc.

About 82 percent of the 1,378 visitors contacted during the on-site survey provided a full address with a zip code in order to participate in the mail survey portion of the Recreation Visitor Survey. The addresses provided indicated that most visitors resided in California (Table E5.2.1-28). Zip codes were provided for residences in 44 different California counties. Nearly 40 percent of those surveyed were residents of Plumas County or adjacent Lassen, Shasta, Tehama, and Butte counties. More than half of those visitors were from Butte County (primarily from the towns of Chico and Paradise). Sacramento County accounted for another 4 percent of visitors. Thirty-one percent of the visitors resided in 38 other northern, central, or southern California counties. Seven percent were residents of Nevada (primarily from the communities of Reno, Sparks, or Fallon). About 2 percent were from states besides California or Nevada, including a few from states in the mid-west.

Table E5.2.1-28
County of Residence of Project Area Visitors Surveyed

County	Frequency	Percent
Plumas and Surrounding Counties	519	38%
Plumas County	54	4%
Lassen County	88	6%
Shasta County	42	3%
Tehama County	52	4%
Butte County	283	21%
Sacramento County	50	4%
Other California Counties (38 Counties)	431	31%
Nevada Counties	98	7%
Counties Outside California and Nevada	30	2%
Residence unknown/No address provided	250	18%
Total	**1,378**	**100%**

Note: County of residence was identified using the zip codes provided by on-site survey respondents when asked for an address to which a follow-up mail survey could be sent.
Source: EDAW, Inc.

E5.2.1.4.4 Discussion of Recreation Visitor Survey

Visitor groups responding to the combination of on-site and mail-back surveys at all sites in the Project area averaged 4–5 persons with the average utilization of two vehicles for their visits. The most popular activities of many visitors in the Project area are swimming, fishing, sightseeing and wildlife viewing. Historically, swimming and hiking appear to be the favored activities.

Natural and undeveloped settings were favored among Butt Valley Reservoir and Belden Reach visitors while Lake Alamanor visitors preferred developed sites first. All visitors preferred nature-oriented recreation.

Responses regarding the most utilized site within the Project area illustrate that Lake Almanor is the popular destination, except for Butt Valley Reservoir visitors who are more likely to visit the reservoir.

Responses regarding how the Project area was utilized in the 12 months prior to the survey as compared to other northern California recreation areas also proved that Lake Almanor was the most popular destination. Contributing factors in the respondents' choice to recreate in the Project area include the sense that it was a "special place," the scenery and the peace and quiet. Camping and fishing opportunities were also important factors.

During the survey period, most visitors felt that sites were not at all crowded. However, perceptions of on-water crowding leaned toward feelings of being slightly crowded.

Visitors confirmed that the number of people at a given site does not effect their enjoyment of that area. Correspondingly, respondents agreed that they did not change the times or locations of their visit due to crowding.

In reviewing problems encountered by visitors to all areas, it is important to note that the issues that received the highest response were those that were considered "not a problem." These included interaction between visitors and residents, the ability to access the shoreline and noise from boats and PWCs. Belden Reach visitors additionally responded that the costs to use facilities were not a problem. The effect of water levels on the enjoyment and safety of the visitors was considered moderately acceptable by Lake Almanor visitors and totally acceptable by Butt Valley Reservoir and Belden Reach respondents. The 2001 drought likely influenced boater responses to be more negative compared to a normal water year.

Shower facilities at campgrounds, DUAs, and fish cleaning stations were deemed to be the most important facility needs for Lake Almanor and Butt Valley Reservoir visitors, whereas Belden Reach visitors felt that there needs to be increased screening between campsites.

In general, there was an even split between male and female guests for all three survey sites. Of those responding to the survey, the mean age was approximately 50 years-old, with most visitors having some college education. The income of those visiting Lake Almanor was higher than Butt Valley Reservoir visitors and significantly higher than

Belden Reach respondents. A summary of the most prominent responses from the survey is shown in Table E5.2.1-29.

E5.2.1.5 Area Resident Survey

E5.2.1.5.1 Introduction

The Area Resident Survey assessed the attitudes, perceptions, and characteristics of three Project area resident user groups: reservoir shoreline (Lake Almanor), reservoir back-lot, and town and environs residents. The survey focused on recreation-related issues, needs, and perceptions that apply specifically to area residents. The survey also replicated many of the items in the Recreation Visitor Survey so responses from the two groups could be compared.

E5.2.1.5.2 Methods

Survey respondents were randomly selected from a Licensee-provided list of residents in or near the Project area.

The sample was stratified for three homeowner types:

- Reservoir shoreline residents (on the shore);
- Reservoir back-lot residents (nearby, but off the shore); and
- Towns and environs residents (nearby, typically adjacent to river reaches).

The target number of completed surveys from the two larger groups (shoreline and back-lot residents) were 200 each, for a total of at least 400 completed surveys. A small

Table E5.2.1-29
Visitor Survey Summary Table

	Lake Almanor	Butt Valley Reservoir	Belden Reach
Visitor Info & Visit Description			
Group Size (people)	5	5	4
Number of Vehicles per Visit	2	2	2
Primary Activity	swimming	swimming, fishing	swimming, fishing
Secondary Activity	sightseeing, wildlife viewing	sightseeing, wildlife viewing	sightseeing, wildlife viewing
Patterns of Use			
Percent that Typically Visit Project Area	34.25	40.75	36.75
Activity Historically Participated In	fishing	fishing	fishing
Recent visits to Northern California Recreation Areas	Lake Almanor	Lake Almanor	Lake Almanor
Favorite Northern California Recreation Area	Lake Almanor/Lake Tahoe	Butt Valley Reservoir/Lake Tahoe	Belden Reach/Lake Tahoe
Preferred settings for general outdoor recreation	Developed; nature-oriented/natural and undeveloped	Natural and undeveloped/ developed; nature-oriented	Natural and undeveloped/ developed; nature-oriented
Perceptions of Crowding in Project Area			
Current Visit is Not Crowded	25 percent	19 percent	26 percent
Perceptions of On-water Crowding	2.95 mean score	2.8 mean score	3.4 mean score
Number of People does Not have Effect on Enjoyment	43 percent	33 percent	30 percent
No Changes Made in Visit Timing/Location due to Crowding	57 percent	50 percent	49 percent
Factors in Visitors' Choice of Project Area			
Top Three Factors	Special place, scenery, peace and quiet	Peace and quiet, special place, speed limit	Camping, special place, peace and quiet/fishing
Perceptions of Resource, Managerial, and Social Conditions			
Issued considered "Not a Problem" (top three)[1]	Interactions: visitors/residents; Noise: boats, PWC; Ability to access shoreline	Number of watercraft; Noise: boats, PWC; Ability to access shoreline	Interactions: visitors/residents; Ability to access shoreline; Cost to use facilities
Affect of Water Levels on Enjoyment and Safety	Moderately Acceptable	Totally Acceptable	Totally Acceptable

	Lake Almanor	Butt Valley Reservoir	Belden Reach
Potential Improvements in Facilities and Services (top two)	Provide electric hook-ups for campers (49 percent); Create no-wake zone (46 percent)	Provide electric hook-ups for campers (38 percent); Install more pay phones (49 percent)	Provide electric hook-ups for campers (35 percent); Install more pay phones (43 percent)
Evaluations of Current Developments and Services (top three)	Shower facilities at campgrounds (75 percent); Shower facilities at DUAs (69 percent); Fish cleaning stations (50 percent)	Shower facilities at campgrounds (84 percent); Shower facilities at DUAs (62 percent); Fish cleaning stations (62 percent)	Screening between campsites (66 percent); Number of interpretive programs (50 percent); Number of group campsites (49 percent)
Visitor Demographics			
Age (mean average)	50	49	51
Education (some college)	38 percent	49 percent	43 percent
Income (highest by percent)	>$100,000/year	$40–60,000/year	$20–40,000/year

[1]*The highest percentages occurred in the "not a problem" category. Therefore, issues that were a "big problem" (category 4) are not shown here.*

Source: EDAW, Inc.

number of surveys were mailed to towns and environs residents along or near the Belden Reach and Seneca Reaches, in the towns of Chester, Greenville, and Westwood, due to much lower populations in these corridors. Table E5.2.1-30 summarizes the surveys sent to towns and environs communities. A copy of the Area Resident Survey is found in Appendix E5-I—Recreation Survey Instruments.

Table E.5.2.1-30
Questionnaires Sent and Returned by Community

Community	Questionnaires Sent	Questionnaires Returned	% Returned
Chester	189	43	23%
Greenville	164	28	17%
Westwood	103	15	15%
TOTAL	456	86	19%

Note: These communities represent 75% of the Towns and Environs (T&E) sub-sample (456 of 608).
The response rate from these 3 communities and for the T&E group as a whole was 19%, substantially below the 30% response rate for area residents as a whole, and the 34% returned by "Back-lot" and 39% returned by "Shoreline" residents.

This method ensured that an adequate number of surveys were received from each user group to fully represent nearby communities. Shoreline residents own lakefront property at Lake Almanor. Back-lot residents include those people that live nearby Lake Almanor, but not along its immediate shoreline. Towns and environs residents typically live in them towns of Chester, Greenville, Westwood, Baily Creek, Clear Creek, Crescent Mills, and Canyon Dam; the lower SR 70 corridor (Belden) and along Seneca Reach (Town of Seneca).

E5.2.1.5.2.1 Area Resident Survey Recreation Season

Area residents were sampled during the end of the recreation season to ensure that they were reachable by mail. Many of the area residents use the study area as a setting for a second home, but vacate the area after the recreation season.

The end of the recreation season is also a good time to survey area residents because they have recent exposure to Project conditions and can best articulate them at that time.

E5.2.1.5.2.2 Area Resident Survey Tools and Approach

The survey focused on recreation-related issues that apply specifically to area residents. The study had one survey instrument sent to three types of homeowners using standard mailing procedures (Dillman 2000).

Surveyed reservoir shoreline residents included homeowners on Lake Almanor's shore such as parts of the Lake Almanor Country Club, Lake Almanor West, Eastshore, and the

Hamilton Branch areas. Surveyed back-lot residents included homeowners in these same areas, however, their residences are located off Lake Almanor's shore, but nearby.

Surveyed towns and environs residents included those along Seneca and Belden Reaches, Crescent Mills, Greenville, Chester, Westwood, Baily Creek, Clear Creek, and Canyon Dam.

E5.2.1.5.2.3 Area Resident Survey Sample Schedule and Frequency

Surveys were sent through the mail using the stratified random approach. Each packet included a cover letter, a copy of the survey, and a stamped, return envelope.

One week to 10 days after this initial mailing, a postcard reminder was sent to those individuals who had not returned a survey, in order to ensure an adequate sample size and response rate (Dillman 2000).

E5.2.1.5.3 Area Resident Survey Results

E5.2.1.5.3.1 General Visit Characteristics

Most area residents (91.4 percent) indicated they visited the Project area for recreation (see Table E5.2.1-31), and the majority of respondents stated they most frequently visited Lake Almanor (see Table E5.2.1-32). In contrast less than 1 percent of the all area residents indicated they visited Butt Valley Reservoir, or the Belden Reach or Seneca Reach areas most frequently.

Table E5.2.1-31
Reason for Visiting UNFFR Areas

Visit UNFFR areas for recreation?	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Yes	91.9	94	87.1	91.4
No	—	—	—	—

Source: EDAW, Inc.

Table E5.2.1-32
Area Visited Most Frequently for Recreation

Area Visited Most Frequently	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Butt Valley Reservoir	—	1.4	1	0.7
Lake Almanor	100	97.2	98	98.5
Belden Reach	—	—	1	0.2
Seneca Reach	—	1.4	—	0.5

Source: EDAW, Inc.

In terms of the visiting groups' composition, there were some differences among the resident types. About three-quarters of the towns and environs residents said they visited with friends only, as compared to approximately 90 percent for shoreline, and 84 percent for back-lot residents (see Table E5.2.1-33).

For all resident types, very few (5 percent or less) visited the Project area alone or as part of an organized group. Typical group size also varied by resident type. About three-fourths of shoreline and back-lot residents visited in groups ranging from four to 10 people, as compared to 60 percent for towns and environs residents (Table E5.2.1-34).

Table E5.2.1-33
Group Composition During Visits to UNFFR Areas for Recreation

Group composition	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Family only	8.9	14.3	18	13
Family and Friends	0.6	0	1	0.5
Friends only	89.9	84.3	74	84.1
Usually alone	—	—	5	1.2
Organized group	0.6	1.4	2	1.2

Source: EDAW, Inc.

Table E5.2.1-34
Group Size for a Typical Visit

Group Size	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
2–3 people	13	20.7	31.2	20
4–5 people	43.8	41.5	39.8	42.1
6–10 people	33.3	33.3	20.4	30.3
11–15 people	7.4	3	6.5	5.6
More than 15 people	2.5	1.5	2.2	2.1

Source: EDAW, Inc.

As shown in Table E5.2.1-35, about half of the respondents stated they used the Project area with approximately the same frequency during the preceding 12 months, with the back-lot residents having the lowest proportion (46 percent) in this category, and towns and environs residents having the highest (57 percent). About three-fourths of shoreline and back-lot residents rated their primarily-used Project area recreation facilities as better than most other similar areas, as compared with only about six of 10 towns and environs residents (see Table E5.2.1-36).

Table E5.2.1-35
Frequency of Use of During Last 12 Months

Frequency of Use of Project Area Recreation Areas	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Less	25.7	35.7	31.6	30.6
The same	52.7	46.4	57.1	51.6
More	21.6	17.9	11.2	17.8

Source: EDAW, Inc.

Table E5.2.1-36
Rating of Use of Project Recreation Facilities Compared to Similar Areas

Rating	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Less than any other similar areas	1.2	1.4	1	1.3
Less than most other similar areas	3.7	2.1	3	3
About the same as most other similar areas	18.6	22.9	40.4	25.5
Better than most other similar areas	38.5	47.9	37.4	41.5
Better than any other similar areas	37.9	25.7	18.2	28.8

Source: EDAW, Inc.

As shown in Table E5.2.1-37, most area residents use the Project area in late summer, however, the proportion of towns and environs residents was substantially less (36.4 percent) compared to shoreline (53.8 percent) and back-lot residents (51.5 percent).

The majority of area resident respondents represent the "senior" segment of the population. Almost half (49 percent) of shoreline residents reported they were 65 years or older, as compared to 41 percent for back-lot residents and 35 percent for towns and environs residents (see Table E5.2.1-38).

Table E5.2.1-37
Seasonal/Holiday Visits

Season/Holiday	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Spring	12.5	12.9	19.2	14.3
Memorial Day Weekend	1.9	0.8	2	1.5
Early Summer	21.9	21.2	28.3	23.3
Independence Day	5.6	7.6	7.1	6.6
Late Summer	53.8	51.5	36.4	48.6
Labor Day Weekend	1.3	0	2	1
Fall	1.9	4.5	4	3.3
Winter	1.3	1.5	1	1.3

Source: EDAW. Inc.

Table E5.2.1-38
Area Residents' Age Distribution

Ages	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
1–45 years-old	6	11	14	9
46–64 years-old	46	48	51	48
65 years-old or older	49	41	35	43

Source: EDAW, Inc.

Most respondents (about 95 percent for all three resident types) listed California as their permanent residence (see Table E5.2.1-39).

Among those who did, 40 percent of shoreline residents stated they lived in either Butte or Plumas County, followed by 50 percent for back-lot residents, followed by almost six out of 10 towns and environs residents (57 percent) reporting that they lived in one of these counties (see Table E5.2.1-40).

Table E5.2.1-39
State of Permanent Residence

State	Valid Percent
Arizona	0.64
California	94.86
Colorado	0.21
Hawaii	0.21
Nevada	2.78
Oregon	0.21
Texas	0.21
Virginia	0.21
Washington	0.43
Washington, DC	0.21
Total	**100**

Source: EDAW, Inc.

Table E5.2.1-40
County of Permanent Residence

County	Valid Percent	County	Valid Percent
Alameda	28	Riverside	0.93
Butte	12.73	Sacramento	31
Colusa	0.46	San Bernardino	0.69
Contra Costa	3.70	San Diego	0.69
Del Norte	0.23	San Francisco	0.23
El Dorado	0.93	San Joaquin	0.23
Glenn	0.93	San Mateo	3.47
Kern	0.46	Santa Clara	5.56
Lake	0.23	Santa Cruz	1.85
Lassen	4.17	Shasta	1.16
Los Angeles	2.32	Solano	1.62
Marin	1.62	Sonoma	1.85
Mariposa	0.23	Sutter	0.93
Mendocino	0.46	Tehama	0.69
Monterey	0.46	Tulare	0.23
Napa	0.69	Tuolumne	0.23
Nevada	0.69	Ventura	0.93
Orange	28	Yolo	0.93
Placer	2.55	Yuba	0.23
Plumas	37.50	**Total**	**100**

Source: EDAW, Inc.

As shown in Table E5.2.1-41, length of ownership for all resident respondents averaged 20 years, with towns and environs residents indicating slightly longer ownership (average 23 years) than shoreline residents (average 17 years).

Table E5.2.1-41
Length of Ownership

Number of Years	Valid Percent	Number of Years	Valid Percent
1	3.2	31	0.9
2	6.4	32	0.9
3	3.4	33	0.6
4	2.1	34	0.9
5	2.8	35	1.9
6	2.6	36	0.6
7	1.7	37	1.7
8	2.4	38	0.2
9	1.1	40	3
10	6.2	41	0.9
11	1.9	42	0.2
12	2.6	43	0.4
13	2.1	44	0.2
14	1.9	45	0.4
15	4.3	46	0.9
16	0.9	47	0.2
17	2.4	48	0.4
18	2.1	49	0.4
19	0.6	50	1.5
20	3.4	52	0.2
21	2.1	53	0.2
22	3.2	55	0.4
23	1.3	59	0.4
24	1.9	60	0.2
25	4.9	72	0.2
26	1.5	73	0.2
27	1.9	90	0.4
28	2.6	100	0.2
29	1.5		
30	6	**Total**	**100**

Source: EDAW, Inc.

E5.2.1.5.3.2 Residents' Perceptions of Crowding

Generally, area residents perceived some crowding during their visits to the Project area. For all three resident groups only about 60 percent stated they felt slightly or more crowded (see Table E5.2.1-42). Similarly, about four in 10 stated that the number of visitors did not really affect their enjoyment of the Project area (see Table E5.2.1-43).

Table E5.2.1-42
Residents' Perceptions of Crowding

Level of Crowding	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
1 Not At All Crowded	13.4	11.5	13.1	12.7
2	12.2	10.1	13.1	11.7
3	18.3	18	14.1	17.2
4 Slightly Crowded	22.6	23	25.3	23.4
5	10.4	6.5	4	7.5
6 Moderately Crowded	15.9	23.7	21.2	19.9
7	3.7	4.3	4	4
8	0.6	2.2	1	1.2
9 Extremely Crowded	3	0.7	4	2.5

Source: EDAW, Inc.

Table E5.2.1-43
Effect of Number of Visitors On Enjoyment

Effect on Enjoyment	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Adds a lot	14.4	16.1	19.6	16.2
Adds a little	7.5	8.8	8.2	8.1
Doesn't really affect	42.5	42.3	45.4	43.1
Detracts a little	32.5	27	18.6	27.2
Detracts a lot	3.1	5.8	8.2	5.3

Source: EDAW, Inc.

For shoreline and back-lot residents only about one-quarter or slightly more indicated they changed their visits to avoid crowding. However, the responses to this question differed substantially for towns and environs residents, with slightly more than half (50.5 percent) indicating they had changed their behavior to avoid crowding (see Table E5.2.1-44). Among those towns and environs residents who changed their behavior, most indicated they avoided visiting the Project area during holiday weekends.

Table E5.2.1-44
Changes in Residents' Visits as a Result of Crowding

Change	Shoreline Residents (percent)	Back-lot Residents (percent)	Town and Environs Residents (percent)	All Residents (percent)
Did not change visits	73.6	69.3	49.5	66.1
Sometimes visited earlier or later to avoid crowds	10.1	13.7	23.1	14.6
Sometimes visit weekdays to avoid weekend crowds	10.1	9.8	17.9	12
Sometime avoid holiday weekends	17	15	30.8	19.9
Try to find quiet places to avoid crowded locations	4.8	12.4	23.9	12.2
Sometimes come earlier or later in the day to avoid busy times	3.2	5.2	10.3	5.7
Sometimes go to other places in northern California	1.6	4.6	12	5.2

Source: EDAW, Inc.

E5.2.1.5.3.3 Residents' Perceptions of On-Site Problems

All three respondent groups surveyed in 2001 (during drought and energy crisis conditions) felt that water level fluctuations are a problem (see Table E5.2.1-45). Nine out of every 10 shoreline residents felt that this was a problem, along with 81 percent of back-lot residents, and 64 percent of town and environs residents.

Table E5.2.1-45
Extent of Problems Encountered by Residents

Questions	Shoreline Residents (percent)			Back-lot Residents (percent)			Towns and Environs Residents (percent)			All Residents (percent)		
	Not a Problem	Problem	Unsure	Not a Problem	Problem	Too Low	Not a Problem	Problem	Unsure	Not a Problem	Problem	Unsure
Ability to access the public shoreline	72	19	9	56	40	4	42	50	8	59	34	7
Development on or near the shoreline	69	24	7	46	47	7	44	43	13	54	37	9
Litter around the lake shoreline	53	42	5	55	40	5	41	50	9	51	43	6
Sanitation around the lake shoreline	65	26	9	63	26	11	48	40	12	60	29	11
Cost to use facilities	76	5	19	70	20	10	62	23	15	70	15	15
Numbers of people at developed facilities	56	28	16	55	38	7	46	43	11	53	35	12
Ability to find a picnic table	47	11	42	48	34	19	41	41	18	46	26	28
Ability to find a campsite	29	13	58	29	29	42	30	47	23	29	27	44
Amount of convenient parking	20	57	23	54	32	14	54	34	12	55	28	17
Numbers of watercraft on the lake	70	28	2	62	34	4	59	26	15	64	29	7
Noise from boats and personal watercraft	42	56	2	41	56	3	51	38	11	43	52	5
Boat speed or wake effects	46	51	3	51	45	4	49	38	13	49	46	5
Ability to launch a boat or watercraft	62	29	9	51	40	9	42	42	16	53	36	11
Wait times to launch a boat or watercraft	67	20	13	55	32	13	51	30	19	59	27	14
Behavior by other users	52	40	8	56	37	7	49	43	8	52	40	8
Use of alcohol by other users	53	26	21	51	28	21	47	38	15	51	30	19
Interaction between waterskiers and other users	67	25	8	57	26	17	45	34	21	58	27	15
Interaction between visitors and residents	64	30	6	62	28	10	57	25	18	61	28	11
Interaction between boaters and anglers	60	28	12	44	38	18	42	33	25	50	33	17
Interaction between horse riders and other users	48	2	50	41	4	55	54	7	39	47	4	49
Boat-in use of the undeveloped shoreline areas	55	15	30	48	13	39	46	19	35	50	16	34
Water level fluctuations	9	90	1	14	81	5	25	64	11	15	80	5
Exposed land during lower water levels	13	85	2	19	75	6	31	56	13	19	75	6

Questions	Shoreline Residents (percent)			Back-lot Residents (percent)			Towns and Environs Residents (percent)			All Residents (percent)		
	Not a Problem	Problem	Unsure	Not a Problem	Problem	Too Low	Not a Problem	Problem	Unsure	Not a Problem	Problem	Unsure
Shallow areas during lower water levels	11	87	2	15	81	4	30	56	14	17	77	6
Floating debris in the water	44	55	1	40	52	8	37	47	16	41	52	7
Overall safety and security	63	33	4	69	24	7	49	34	17	62	30	8
Traffic and congestion on nearby roads	75	21	4	68	27	4	60	32	8	69	26	5
Adequate protection from the wind	66	20	14	59	21	20	61	22	17	62	21	17
Adequate information/warnings provided	57	26	17	65	18	17	62	20	18	61	22	17
Trespass on private property	53	35	12	61	21	18	48	28	24	55	29	17
Gates and other development blocking foot access to the public shoreline	70	13	17	52	31	17	41	41	17	57	26	17
Amount of private residents' ownership of the shoreline	85	8	7	55	38	7	40	39	21	64	25	11
Interaction between personal watercraft and other uses	34	62	4	27	62	11	34	40	26	31	57	12
Quality of water in the lake	75	22	3	70	22	8	54	28	18	68	23	9
TOTALS	**100**			**100**			**100**			**100**		

Source: EDAW, Inc.

Coinciding with the low water levels, exposed land during lower water levels, and shallow areas during lower levels were also noted as problem issues. Shoreline residents responded highest about these low water issues, with about 85 percent perceiving it as a problem. Just over three-quarters of back-lot residents saw the low water associated issues as problems. Over half of the town and environs residents felt the issues of exposed land during low water levels, and shallow areas during lower levels needed attention. Nearly one half of all respondents felt that floating debris was a problem (55 percent of shoreline residents, 52 percent back-lot residents, and 47 percent towns and environs residents).

Along with the issue of water level, issues related to boats and PWCs were also of concern to all three groups. Over half of the shoreline residents (56 percent) and back-lot residents (56 percent) felt that noise from boats and PWCs was a problem. Nearly four out of 10 towns and environs residents felt that these issues were a problem. Interaction between PWCs and other users is a problem, noted by over 60 percent of shoreline and back-lot residents. Four out of every 10 towns and environs residents felt this issue needed to be addressed. Similar to the issue of noise from boats and PWCs, the issue of boat speed or wake effects had approximately 50 percent of shoreline and back-lot residents responding. About 40 percent of towns and environs residents also felt that boat speed or wake effects were an issue.

The three surveyed groups did not feel that the cost to use facilities was a problem. Over three-quarters of the shoreline residents surveyed felt that the cost to use the facilities was

not a problem, along with 70 percent of back-lot residents as well as 62 percent of towns and environs residents. Traffic and congestion on nearby roads, as well as the quality of water in the lake, was not perceived as a problem by 75 percent of shoreline resident respondents, nor by approximately 70 percent of back-lot residents nor nearly 60 percent of towns and environs residents. Approximately 60 percent of all respondents felt that interaction between visitors and residents was not a problem at Lake Almanor.

E5.2.1.5.3.4 Residents' Evaluation of Current Developments and Services at Lake Almanor

Survey respondents were asked to evaluate the adequacy of the number or amount of 29 current developments and services at Lake Almanor (too high, about right, too low). Results are reported in Table E5.2.1-46. For 10 of those developments, a majority of at least one group felt the amount provided was too low. A majority of towns and environs residents felt that nine types of developments or services were inadequate, while a majority of back-lot residents expressed this opinion about only three developments or services, and shoreline residents expressed this opinion about only one type of facility.

The issue of the number of restrooms around the shoreline was of concern for all three groups surveyed. Fifty-eight percent of back-lot residents, over one-half of towns and environs residents, and about one-half of shoreline resident respondents felt that this was a problem (i.e., too few).

Table E5.2.1-46
Area Residents' Evaluation of Current Developments and Services at Recreation Area

SURVEY QUESTION: What is your opinion about the level of existing developments and management at your primary UNFFR resource area?

Development	Shoreline Residents		Back-lot Residents		Towns and Environs Residents		All Residents	
	Mean Rating	Percent	Mean Rating	Percent	Mean Rating	Percent	Mean Rating	Percent
Number of boat ramps	3.5	28	3.7	39	3.9	51	3.6	37
Number of docks or temporary moorage	3.4	30	3.7	46	3.8	51	3.6	40
Number of restrooms around the shoreline	3.9	50	4.0	58	4.0	54	3.9	54
Number of campgrounds	3.4	23	3.3	21	3.7	46	3.4	28
Presence of campground hosts	3.2	16	3.2	12	3.3	26	3.2	17
Number of boat-in campsites	3.4	25	3.5	28	3.5	37	3.4	29
Number of campsites with RV hookups	3.5	34	3.5	30	3.9	48	3.6	37
Amount of parking along roads	3.4	28	3.5	33	3.8	51	3.6	36
Law enforcement presence	3.4	30	3.3	19	3.9	35	3.4	27
Cost of campsites[a]	2.9	8	2.8	17	2.3	47	2.7	24
Number of paved bike trails	3.7	45	3.7	43	3.6	36	3.7	42
The number of mountain bike trails	3.5	33	3.6	36	3.5	33	3.5	34
Number of hiking trails	3.5	31	3.5	29	3.5	38	3.5	32
Number of equestrian facilities	3.4	27	3.3	22	3.4	22	3.3	24
Number of marinas	3.3	25	3.3	24	3.3	26	3.3	25
Number of group campsites	3.2	20	3.3	21	3.7	42	3.4	27
Number of signs indicating trail locations	3.5	31	3.6	38	3.5	39	3.5	35
Amount of public access areas on shoreline	3.3	21	3.8	46	4.1	65	3.7	41
Amount of screening between campsites	3.4	29	3.5	39	3.7	40	3.5	36
Number of developed day use or picnic areas around the shore	3.5	30	3.8	47	3.9	51	3.7	42
Number of interpretive programs/educational opportunities	3.6	39	4.0	56	3.9	45	3.8	46

SURVEY QUESTION: What is your opinion about the level of existing developments and management at your primary UNFFR resource area?								
Development	**Shoreline Residents**		**Back-lot Residents**		**Towns and Environs Residents**		**All Residents**	
	Mean Rating	Percent	Mean Rating	Percent	Mean Rating	Percent	Mean Rating	Percent
Boat-in gas stations	3.4	28	3.5	32	3.5	30	3.5	30
Fish cleaning stations	3.7	41	4.0	59	3.8	51	3.8	49
Shower facilities at campgrounds	3.5	31	3.8	49	4.3	68	3.9	50
Shower facilities at day use areas	3.6	33	3.8	47	4.2	64	3.8	48
Boat-in primitive campsites	3.5	28	3.7	40	3.7	44	3.6	37
Drive-in primitive campsites	3.4	26	334	25	3.6	41	3.5	31
Shade tree areas	3.3	31	3.2	17	3.4	28	3.3	22
Group picnic sites	3.3	20	3.3	19	3.7	41	3.4	26
Other (items added by respondents)	5.0	100	5.0	100	5.0	100	5.0	100

Notes: The rating system was based on five-point scale in which 1 = Too High, 3 = About Right, 5 = Too Low.

Percent columns indicate responses of 4 or 5 (i.e., on the "Too Low" side of the scale). Mean ratings and percents do not include N/A responses and non-responses.

"These percent values, opposite of those given for all other items, indicate responses of 1 or 2 (i.e., the "Too High" side of the scale), which are judged to be more meaningful responses for this item.

Source: EDAW, Inc.

Two of the three groups perceived the amount of shower facilities at DUAs as inadequate. Just fewer than 65 percent of towns and environs residents felt the amount of showers at day use facilities was too low, as did nearly one-half of the back-lot residents. Only one-third of the shoreline residents saw this issue as a problem. Similarly, the amount of shower facilities at campgrounds was considered too low by about one-third of the shoreline residents and nearly one-half of the back-lot residents. In contrast, nearly seven out of 10 towns and environs residents thought that the amount of shower facilities at the campgrounds was too low.

Many back-lot residents (59 percent) felt strongly that there were not enough fish cleaning stations located around Lake Almanor, as did just over one-half of the towns and environs residents and 41 percent of shoreline residents. The number of paved bike trails around Lake Almanor was an issue that approximately 36 to 45 percent of respondents in each group said was too low, with the lowest percentage among the towns and environs residents.

The amount of public access areas on the shoreline was an issue that brought a variety of responses from the three groups surveyed. Almost seven out of every 10 towns and environs residents surveyed felt the amount of public access to the shoreline was too low, yet only 22 percent of shoreline residents responded the same way. Back-lot residents were about evenly split on the issue of public access to the shoreline, as 46 percent said that it was a problem. The three groups also disagreed that the cost of campsites was a problem. Only 17 percent of back-lot residents and 8 percent of shoreline residents with

an opinion felt that the cost of campgrounds was too high (a majority did not provide a rating). However, most towns and environs residents provided a rating, and 47 percent felt the cost of campsites was too high.

E5.2.1.5.3.5 Residents' Evaluation of Current Developments and Services at Lake Almanor

Survey respondents were asked to evaluate the adequacy of current developments and services at Lake Almanor. The issue of the number of restrooms around the shoreline was significant for all three groups surveyed. Over six out of every 10 towns and environs residents felt that this was a problem, whereas 57 percent of back-lot residents and 43 percent of shoreline resident respondents concurred. Along with restrooms, all three groups saw the amount of shower facilities at DUAs as an issue. Just fewer than 70 percent of towns and environs residents saw the amount of showers at day use facilities as a problem. Over half of the back-lot residents felt that there was a lack of shower facilities at DUAs. Only one-quarter of the shoreline residents saw this issue as a problem.

Back-lot residents (66 percent) felt strongly that there were not enough fish cleaning stations located around Lake Almanor.

Just over one-half of the towns and environs resident, and 35 percent of shoreline residents felt that the number of fish cleaning stations was an issue. The number of paved bike trails around Lake Almanor was an issue that approximately 40 percent of all respondents said was a problem. The amount of public access areas on the shoreline was

an issue that brought a wide variation of responses from the three groups surveyed. Almost seven out of every 10 towns and environs residents surveyed felt the amount of public access to the shoreline was a problem, yet only 17 percent of shoreline residents responded the same way. Back-lot residents were split on the issue of public access to the shoreline as 50 percent said that it was a problem.

The issue that all three groups agreed was not a problem was the cost of campsites. Only 1 percent of back-lot residents, 4 percent of shoreline residents, and 6 percent of towns and environs residents replied that cost of campgrounds was a problem. Similarly, the presence of campground hosts was not considered a problem. About one out of every 10 shoreline and back-lot residents thought that the presence of campground hosts was a problem, and just over three out of every 10 towns and environs residents felt this way. The amount of shower facilities at campgrounds was not considered a problem by the shoreline residents (11 percent) or the back-lot residents (26 percent). Four out of 10 towns and environs residents thought that the amount of shower facilities at the campgrounds was a problem at Lake Almanor.

E5.2.1.5.3.6 Residents' Boat Use Characteristics

Most residents stated they used a powerboat for skiing or fishing on Lake Almanor. Among all three resident types the towns and environs group indicated the highest use on Butt Valley Reservoir, with only 13 percent stating they used a powerboat for fishing on Butt Valley Reservoir. About twice as many shoreline residents (46 percent) stated they used a powerboat for fishing on Lake Almanor compared to about one in five (19

percent) of towns and environs residents. Use of non-motorized craft on Lake Almanor and Butt Valley Reservoir was low among all three resident types.

Regarding typical mooring or storage methods, most residents moor or store their boats on Lake Almanor at a single dock or at a mooring ball/buoy, with the shoreline residents demonstrating the highest proportion of respondents using these methods. Boat launch locations showed wide variation within and between resident types. For example, among shoreline residents, 10 percent stated they launched boats at Lake Almanor Resort, 11 percent at Canyon Dam, 9 percent at North Shore Campground, 6 percent at Big Cove Resort, and 5 percent at Almanor Campground.

Similar patterns are found for back-lot and towns and environs residents. For both shoreline and back-lot residents, more than one-third indicated that they launched their boats at other locations. One area of divergence between groups concerns towns and environs residents: more than half of this group (52 percent) launched boats at Canyon Dam.

E5.2.1.5.4 Discussion of Area Resident Survey

Area resident survey data are summarized in Table E5.2.1-47. Of those responding to the resident survey, 95 percent from the shoreline group, 89 percent from the back-lot group, and 86 percent from the town and environs group were above the age of 45. The vast majority of those responding to the resident survey were from California (95 percent). Of the shoreline, back-lot, and towns and environs survey groups, just over nine out of every

Table E5.2.1-47
Area Resident Survey Summary

	All Residents (percent)	Reservoir Shoreline (percent)	Reservoir Back-lot (percent)	Towns and Environs (percent)
General Visit/Respondent Characteristics				
Age (65 years>)		49	41	35
Residence: California	95	—	—	—
Visitors to Lake Almanor	91.4	—	—	—
Visitors to Butt Valley Reservoir	<1	—	—	—
Visitors to Belden/Seneca Reaches	<1	—	—	—
Season of use (late summer)		53.8	51.5	36.4
Visited with friends		90	84	75
Perceptions of Crowding				
Changed behavior to avoid crowding		25+	25+	50.5
Extent of Problems Encountered				
Water level fluctuations		90	81	64
Exposed land		85	75	50+
Floating debris	50			
Noise from boats/watercraft		56	56	38
Boat speed/wake effect	50			
Costs not a problem		75	70	62
Evaluation of Current Developments and Services at Lake Almanor				
Need more rest rooms/showers		43/25	57/50+	60/<70
Lack of fish cleaning stations (Lake Almanor)		35	66	50+
Number of paved bike trails	40			
Shoreline access limited		17	50	70
Campground (Almanor) cost/shower facilities		1/11	4/26	6/40
Boating Characteristics				
Use of powerboat for skiing/fishing Lake Almanor Butt Valley Reservoir Use of non-motorized craft	Low	46	—	19 highest

Source: EDAW, Inc.

10 respondents said that they had visited Lake Almanor, with less than one out of 10 noting that they had visited Butt Valley Reservoir or Belden Reach. The season with the highest use by the three survey groups was late summer, as 53.8 percent of shoreline,

51.5 percent of back-lot, and 36.4 percent of towns and environs residents visited the Project area during this time. The majority of residents surveyed responded that they visited the area with friends (90 percent shoreline, 84 percent back-lot, and 74 percent towns and environs).

The most common activity of those responding to the resident survey was swimming. Just over 80 percent of shoreline residents responded that they participated in swimming, with 75 percent of back-lot residents, and 52 percent of towns and environs residents likewise participating in swimming. Slightly over seven out of 10 respondents from the shoreline group as well as the back-lot group noted that they have participated in fishing in the Project area, with 56 percent of towns and environs residents likewise noting that they have fished at this location. One-half of those responding from the towns and environs group noted that they have hiked in the Project area, with just over six out of 10 shoreline and back-lot respondents concurring.

Only one-quarter of the residents surveyed from the shoreline and back-lots changed their behavior to avoid crowding, while over one-half of the towns and environs residents noted that they had altered their behavior in some way to avoid crowding.

When asked about what problems were encountered, the majority of issues revolved around water level, as 90 percent of shoreline residents, 81 percent of back-lot residents, and 64 percent of towns and environs residents felt that water level fluctuation was a problem. Coinciding with water level fluctuations, exposed land was noted as a problem

by 85 percent of shoreline residents, 75 percent of back-lot residents, and just over 50 percent of towns and environs residents.

Approximately one-half of all residents surveyed felt that floating debris was an issue that needed to be addressed. Fifty-six percent of shoreline and back-lot residents responded that noise from boats/PWCs was a problem, whereas only 38 percent of towns and environs residents felt this way. Similarly, five out of 10 shoreline residents and back-lot residents felt that boat speeds/wake effects were issues, while nearly four out of 10 town and environs residents responded that it was a problem. Costs to use the recreation area was not considered a problem by 75 percent of shoreline residents, 70 percent of back-lot residents, and 62 percent of towns and environs residents.

Just over four out of 10 shoreline residents, and approximately six out of 10 back-lot and towns and environs residents responded that there need to be additional restrooms, when asked to evaluate current developments and services at Lake Almanor.

Along with restrooms, additional showers were noted as required by 25 percent of shoreline, approximately 50 percent of back-lot, and just fewer than 70 percent of towns and environs residents. Back-lot residents responded most frequently (66 percent) that there was a lack of fish cleaning stations at Lake Almanor, while just over 50 percent of town and environs residents and 35 percent of shoreline residents felt the same. Forty percent of all residents responding to this survey felt that additional paved bike trails around Lake Almanor are needed.

There was a large gap in opinion on whether there is currently enough shoreline access, as 70 percent of towns and environs residents noted that there needs to be more added, 50 percent of back-lot residents responded the same, while only 17 percent of shoreline residents responded that this was a problem. The cost of the campgrounds at Lake Almanor was an issue which all residents responded to in the same way, as only 1 percent of shoreline, 4 percent of back-lot, and 6 percent of towns and environs residents felt that this was a problem.

There was a low response by all three survey groups on the use of non-motorized watercraft. Nearly five out of 10 shoreline residents responded that they used a powerboat for fishing or waterskiing at Lake Almanor. Nearly two out of 10 respondents from the towns and environs group responded that they used a powerboat for waterskiing or fishing, yet they did have the highest response for powerboat users at Butt Valley Reservoir.

Regarding the adequacy of the mail survey sample obtained for the Area Resident Survey, overall, the response rate was 30 percent (486 returned out of 1,627 mailed), which was below the target return rate of 40 percent. However, return rates varied considerably among the three area resident subgroups; the return rate was 39 percent for shoreline residents, 34 percent for back-lot residents, and 19 percent for towns and environs residents.

These returns rates should be understood in the context of contemporary similar survey efforts in the state. A 1992 statewide survey for DPR obtained a mail-back response rate of 40 percent. Another statewide survey conducted for DPR in 1997 that used a response incentive achieved a mail-back response rate of 53 percent. Thus, for at least two of the three area resident groups, the response rate was similar to what others have obtained in similar efforts. It should also be understood that a national trend of declining survey participation has been noted by researchers in recent years. Other factors may also affect response. Researchers have found that individuals with lower education levels are less likely to respond (Kubota, 2002, pers. comm.) and that if the level of interest is low, response rates are likely to be low (Baas et al. 1984; Baas 1986). This last factor most likely explains the fact that the lowest responding UNFFR area resident group was towns and environs residents, who live farthest from the lake and do not have the close access, immediate aesthetic concerns, etc. that the other two groups would be expected to have.

It may also be useful to describe the sample sizes needed to achieve an error rate of + or – 10 percent (i.e., results derived from sample data that are within 10 percent of the true value derived from the entire population). The 10 percent error rate is widely used by social scientists working in the natural resources arena. If the goal is to achieve a + or – 10 percent error rate with maximum variance in the true values assumed (e.g., 50 percent true and 50 percent false in responses to a True/False question), and the population (here, households within the survey areas) is 1,000 or less, then a sample of 88 responses is required (Dillman 2000). If the population is as large as 10,000 households, then a sample of 95 would be required (only seven more). Clearly, the proportion of the

population sampled isn't critical above populations of 1,000. If the variance in true response values is smaller (say, 80 percent true to a True/False question), the required sample size shrinks to 58 for populations less than 1,000.

For residents of the community of Chester, it should be pointed out that focus group and business owner surveys were conducted in the Chester area, in addition to the Area Resident Survey, and that Chester residents were part of the on-site visitor survey sample. Twenty-three percent (43 of 189) of the Chester residents that were sent an area resident questionnaire returned it. This means that a lower-than-desired response rate was achieved and a smaller-than-desired sample size was obtained, by a small margin. However, this is a better response rate than that obtained from the two other major communities in the towns and environs sample group, Greenville and Westwood. Response was below 18 percent for both of those communities.

As a check on whether the opinions of Chester residents are well represented by the data contained in the overall towns and environs group sample (n=118), statistical analyses were conducted. These compared responses to key questions on perceptions of crowding on Lake Almanor and perceptions of problems related to natural resource, social, and facility conditions. The results indicated that there was no statistically significant difference between Chester residents' and other towns and environs residents' perceptions of crowding at their primary resource use area within the Project area or in the effects of crowding on their enjoyment. Further, no statistically significant difference was found between Chester residents' and other towns and environs residents'

perceptions of problems for 29 of the 34 items on the questionnaire. Statistically significant differences were found in opinions on the ability to launch a boat and the use of alcohol by others (Chester residents tended to consider these to be bigger, but only slight or moderate, problems than others). Chester residents also were more likely than others to consider problems related to water levels in Lake Almanor (water level fluctuation, exposed shoreline, and shallow areas) to be moderate or big problems.

A similar analysis was conducted that compared the opinions of Chester and Lake Almanor Country Club residents (members of the back-lot residents group, but who are close geographically to Chester). The results were similar to those described above, with no difference in perceptions of crowding, and few differences in perceptions of problem conditions. Not surprisingly, Chester residents were more likely to consider ability to access the shore a big problem than the County Club residents, who have ample shoreline access. Combining the 43 Chester resident responses with shoreline residents on the peninsula and back-lot residents on the Lake Almanor West area and comparing against all other area residents produced almost identical results. Overall, these analyses suggest that although the Chester response rate (and perhaps level of interest) was low, their concerns and perceptions are for the most part represented in the broader area resident data.

E5.2.1.6 Recreation-Related Private Business Owner/Operator Survey

E5.2.1.6.1 Introduction

The purpose of the Recreation-Related Private Business Owner/Operator Survey was to gather and analyze information including:

- How long businesses have been in operation;
- Where most customers come from;
- Which sites customers visit most often in Project area;
- Main destinations of customers;
- Why customers choose particular businesses;
- Issues of highest importance to customers;
- Important Project sites for customers;
- Owner's/operator's impressions about facilities in the Project area;
- Limiting factors for businesses;
- Expansion potential for businesses;
- Planned expansions of businesses;
- Comments for Licensee and state and federal land management agencies regarding Project facilities; and
- Other general comments for the Licensee.

This information afforded an assessment of business owner/operators' attitudes towards the resource area and its management. Also assessed was the affect of businesses on the Project area.

E5.2.1.6.2 Methods

E5.2.1.6.2.1 Private Business Survey Tools and Approach

The survey consisted of two pages of open-ended questions (summarized below). It was mailed to all identified recreation-related businesses in the Project area and vicinity. Within approximately two months of the original mailing, a follow-up mailing occurred to help increase responses. Surveys were mailed in May 2001, and when required, again in July 2001. A few businesses did not participate for unknown reasons, although the majority did respond. A copy of the recreation-related Business Owner's Survey is found in Appendix E5-I—Recreation Survey Instruments.

E5.2.1.6.2.2 Private Business Survey Participant Selection and List of Respondents

All businesses in the Project area vicinity were asked to participate. In essence, a census of recreation-related businesses occurred. The recreation-related private business owner/operators who were solicited included:

- Peninsula Sports and Marine;
- Bodfish Bicycles and Quiet Mountain Sports;
- Anastasia Fishing Guide Services;
- Sierra Bass Outfitters;
- Ayoob Ace Hardware;
- Dr. Del's Fly Shop;
- Baiocchi's Plumas-Sierra Trout Fitters;
- So Bored;
- Big Meadows Fishing Guide Service;

- Big League Outfitters;
- Doug D'Angelo's Guide Service;
- Corey's Auto and Equipment Repair;
- RV/Marine/Snowmobile;
- Golden Eagle Guide Service;
- Lake Cove Resort and Marina;
- Graeagle Stables;
- Roger's Guide Service;
- Hook and Line Fishing Guide Service;
- Out West Guide Service; and
- The Sports Nut.

E5.2.1.6.3 Results

E5.2.1.6.3.1 Interview Sample

The following businesses responded with information for the Recreation-Related Private Business Owner/Operator Survey. Of the 20 businesses solicited, 12 responded with survey information for a 60 percent response rate.

1. Corey's Auto and Equipment Repair
2. Peninsula Sports & Marine Service
3. Roger's Guide Service
4. Hook and Line Fishing Guide Service
5. Bodfish Bicycles and Quiet Mountain Sports
6. Baiocchi's Plumas-Sierra Troutfitters

7. Anastasia Fishing Guide Service
8. Ayoob Ace Hardware
9. Dr. Del's Fly Shop
10. Big League Outfitters
11. The Sports Nut
12. So Bored

E5.2.1.6.3.2 Participant Characteristics

Owners and operators were asked how many years they have operated their present business (see Table E5.2.1-48). The shortest length of time was 3 years. The average length of time was 14.25 years.

Table E5.2.1-48
Private Businesses' Characteristics

Name of Recreation-Related Business	Years in Operation
Corey's Auto and Equipment Repair	6
Peninsula Sports and Marine Service	15*
Roger's Guide Service	30
Hook and Line Fishing Guide Service	4
Bodfish Bicycles and Quiet Mountain Sports	7
Baiocchi's Plumas-Sierra Troutfitters	3
Anastasia Fishing Guide Service	11
Ayoob Ace Hardware	55
Dr. Del's Fly Shop	6
Big League Outfitters	5
The Sports Nut	16
So Bored	13
Average Years in Business	***14.25***
Combined Years All Businesses have Operated	***171***

Source: EDAW, Inc.

This average is skewed due to the fact that one of the businesses has operated for 55 years, which is the longest length of time a business has operated in the area. Combined, the 12 recreation-related businesses that responded with survey information have 171 years of experience in the area. These businesses can be divided into three categories: automotive/marine equipment repair and sales; guide services; and sporting goods stores. These categories were selected because they represent the types of business that can be affected by recreation visit levels in the Project area. There are two (17 percent) automotive/marine/equipment repair sales businesses in this sample. There are five (42 percent) guide services in this sample. There are six (50 percent) sporting goods stores in this sample.

The origin of businesses' customers can be divided into two categories: local and non-local (see Table E5.2.1-49). One of the respondents (8 percent) stated that its customers were all from nearby areas (Corey's Auto Repair).

Table E5.2.1-49
Customer Origin

Project Area Business	Customer Base
1. Corey's Auto and Equipment Repair	Local
2. Peninsula Sports and Marine Service	Both
3. Roger's Guide Service	Not Local
4. Hook and Line Fishing Guide Service	Both
5. Bodfish Bicycles and Quiet Mountain Sports	Both
6. Baiocchi's Plumas-Sierra Troutfitters	Both
7. Anastasia Fishing Guide Service	Not Local
8. Ayoob Ace Hardware	Not Local
9. Dr. Del's Fly Shop	Not Local
10. Big League Outfitters	Not Local
11. The Sports Nut	Not Local
12. So Bored	Not Local

Source: EDAW, Inc.

Seven of the respondents (58 percent) stated that their customers were from outside nearby areas. This included all of California, with Sacramento and the San Francisco Bay Area emphasized. Reno was also mentioned several times as an area from which customers originate. These respondents, who stated that their customers were from outside nearby areas, all own/operate the three business types discussed above. Five of the respondents (42 percent) stated their customers were both local and non-local. These respondents also own/operate the three types of businesses delineated above.

E5.2.1.6.3.3 Attractions Customers Visit in the Project area and Vicinity

Two of the respondents (17 percent), both fishing guide services, stated their customers visit only non-Project-related attractions (see Table E5.2.1-50). Four of the respondents (33 percent) stated their customers visit only Project-related attractions. Respondents from all three types of businesses were in this category.

Table E5.2.1-50
Customers' Visits to Attractions

Name of Business	Project Attraction	Non-Project Attraction
1. Corey's Auto and Equipment Repair	X	X
2. Peninsula Sports and Marine Service	X	
3. Roger's Guide Service	X	X
4. Hook and Line Fishing Guide Service	X	X
5. Bodfish Bicycles and Quiet Mountain Sports	X	X
6. Baiocchi's Plumas-Sierra Troutfitters		X
7. Anastasia Fishing Guide Service		X
8. Ayoob Ace Hardware	X	X
9. Dr. Del's Fly Shop	X	X
10. Big League Outfitters	X	
11. The Sports Nut	X	
12. So Bored	X	

Source: EDAW, Inc.

Six of the respondents (50 percent) stated their customers visited both non-Project-related and Project-related attractions. Respondents from all three types of businesses were in this category.

Main Destination of Customers

Ten of the respondents (83 percent) stated Lake Almanor is an attraction for their customers (see Table E5.2.1-51).

Table E5.2.1-51
Main Destinations of Surveyed Businesses' Customers

Business	Attractions for Customers
Corey's Auto and Equipment Repair	Antelope Lake, Lake Almanor
Peninsula Sports and Marine Service	Lake Almanor
Roger's Guide Service	Plumas County: Lake Almanor, Butt Valley Reservoir, Antelope Lake Lassen County: Eagle Lake
Hook and Line Fishing Guide Service	Lake Almanor, Lassen Park, Chester
Bodfish Bicycles and Quiet Mountain Sports	Lake Almanor, Lassen National Park, outlying areas
Baiocchi's Plumas-Sierra Troutfitters	Local golf courses, Plumas Eureka State Park, Middle Fork Feather River
Anastasia Fishing Guide Service	Grey Eagle/Gold Lakes area
Ayoob Ace Hardware	Lake Almanor, Lassen Park, Butt Valley Reservoir, Feather River, Drakebade
Dr. Del's Fly Shop	Lake Almanor and area streams
Big League Outfitters	Lake Almanor
The Sports Nut	Lake Almanor, Butt Valley Reservoir, NFFR, Lassen Park
So Bored	Lake Almanor

Source: EDAW, Inc.

Lassen Volcanic National Park was mentioned by five of the respondents (42 percent) as a customer destination. Butt Valley Reservoir was mentioned by three of the respondents (25 percent) as a destination for their customers.

Other areas mentioned as visitor included: Eureka State Park, Eagle Lake, area golf courses, the Grey Eagle/Gold Lakes area, and the Drakebade area. River reaches that were mentioned as customer destinations included: the Middle Fork of the Feather River, the North Fork of the Feather River (NFFR), and the NFFR above Chester.

Importance of Individual Project Resource Areas to Customers

Owners/operators were asked to rank the importance of the Project resource areas in influencing visitors (their customers) decision to come to the area. Table E5.2.1-52 displays the respondents' ranking of Project resource areas on a scale of 1–5, 1 being "extremely important" and 5 being "not at all important." Between these two extremes on the rank scale was "very important (2)," "somewhat important (3)," and "not very important (4)."

Table E5.2.1-52
Project Area Resources' Importance to Customers

Project Resource Areas	Lake Almanor	Butt Valley Reservoir	Seneca Reach	Belden Reach
Average Response by Resource Area	1	2.8	3	4

Source: EDAW, Inc.

As Table E5.2.1-52 displays, clearly recreation-related business owners/operators felt Lake Almanor was the most important Project resource area for their customers (all respondents ranked Lake Almanor as extremely important). Butt Valley Reservoir received responses ranging from 1–4 and averaged between very important and somewhat important to customers. The Seneca Reach responses ranged from 2–5 with an averaged rank of 3.

Therefore, respondents felt that the resource is somewhat important to their recreation-related customers. Belden Reach received responses ranging from 2–5 with an average rank of 4, or not very important to their customers.

Two respondents provided comments with their responses. Anastasia Fishing Guide Service stated that they do not use the Project resource areas for business any longer. Hook and Line Fishing Guide Service stated that, "Lake Almanor is like what Lake Tahoe is to that area."

E5.2.1.6.3.4 Reasons Customers Choose Surveyed Businesses

Table E5.2.1-53 displays the owners'/operators' responses to the question of why they think their customers choose to patronize their businesses.

Table E5.2.1-53
Reason for Customers' Choice of Surveyed Businesses

Business	Knowledge	Merchandise	Area
Corey's Auto and Equipment Repair	X	X	
Peninsula Sports and Marine Service			X
Roger's Guide Service	X		X
Hook and Line Fishing Guide Service	X		
Bodfish Bicycles and Quiet Mountain Sports		X	
Baiocchi's Plumas-Sierra Troutfitters	X		
Anastasia Fishing Guide Service			
Ayoob Ace Hardware	X	X	
Dr. Del's Fly Shop	X	X	
Big League Outfitters			X
The Sports Nut		X	
So Bored		X	
Frequency of Response	6	6	3

Source: EDAW, Inc.

The responses can be divided into three broad categories: knowledge (or experience of the business owner/operator); merchandise the business offers; and, area resources nearby the business.

Six of the respondents (50 percent) stated their customers choose their businesses because of staff/owner/operator knowledge or experience. Six of the respondents (50 percent) stated their customers choose their businesses because of merchandise they offer.

Three of the respondents (25 percent) stated they felt customers choose their businesses because they are adjacent to or nearby area resources. For example, Peninsula Sports and Marine Service stated their customers patronize the shop so they can use the lake.

E5.2.1.6.3.5 Most Important Issues to Customers in Area

Five of the respondents mentioned fishing quality as an important issue for their customers. Three of the respondents stated water levels were a concern of customers. The scenic quality of the area was mentioned by two of the respondents as important to their customers. Other responses included the type of area lodging offered, weather (climate), and the safety of the area for a visit.

E5.2.1.6.3.6 Owner/Manager Impressions of Project Recreation Facilities

A variety of responses were provided when owners/operators were asked about their impressions of recreation facilities in Project area. Some respondents gave replies ranging between poor, fair, nice, adequate to good, and good.

Aside from one comment about Butt Valley Reservoir (listed below), all comments were about Lake Almanor. Comments are listed below.

- Keep west shore ramp open in winter.
- A public ramp on east shore Lake Almanor would be an improvement.
- More restrooms available to boaters would be an improvement.
- Lake levels low.
- Campgrounds are too close to Lake Almanor.
- Discontinue driving on beach shore.
- Need more camp areas, showers, and boat ramps.
- Access to Lake Almanor needs improvement.
- Boat ramp at Butt Valley Reservoir needs to be fixed.

E5.2.1.6.3.7 Plans for Businesses' Expansion

The following subsections describe responses about the following topics: limiting factors, room for potential expansion; incentive to expand, and type and character of future planned expansion. Several of these businesses are field based and thus some of the following questions about facilities expansion do not apply to those businesses.

Limiting Factors

Respondents were asked about expanding their businesses and the majority stated they did not have plans to expand. Of the 12 respondents who returned surveys, eight supplied responses for this question.

Limiting factors to expansion cited include: low income to disposable cash ratio for residents and visitors; near retirement (presumably do not want to bother); facilities (presume lease does not allow or property is already built to capacity); and business is a home business.

Room for Potential Expansion

Respondents were asked how much room they had for potential expansion. Of the 12 owner/operators who replied, four responded to this question. Responses ranged between none to three-quarters of an acre.

Incentive to Expand

Respondents were asked what would prompt them to expand. Of the 12 owner/operators who replied, two responded to this question by stating an "increased flow of tourists" and "more business" would provide appropriate incentive to expand their current facilities.

Type and Character of Future Planned Expansion

Respondents were asked about the type and character of their future planned expansions. Of the 12 owner/operators who replied, four responded to this question. Responses ranged between needing to store recreational equipment such as snowmobiles (presumably a garage–type structure); switching from rented property to purchasing land; and providing guide services in lakes that currently do not have water if they once did.

E5.2.1.6.3.8 Owner/Manager Comments for the Licensee and Other Agencies

Recreation-related business owner/operators were given the opportunity to provide general comments to the Licensee. Responses for this question were provided by eight of the proprietors who returned surveys; some respondents provided more that one comment. Comments are listed below.

- Keep lake level up to a certain standard every year.
- Do not allow unlicensed guides to operate.
- Access to Lake Almanor needs to improve.
- Help find a solution to the lack of off street parking in Chester, especially when an all-day event happens.
- The biggest problem in the charter boat business is restroom facilities being so few and far apart. More portables in several locations during the main tourist season would be helpful, Lake Almanor especially.
- US Fish and Wildlife: I would love to have catch and release considered on more of our local fisheries, or at least limit the limit.
- The lake is the people's lake that happens to be leased by the Licensee. They need to manage their resources better.

E5.2.1.6.4 Discussion of Private Business Survey

A summary of the recreation-related business owner survey is shown in Table E5.2.1-54.

Table E5.2.1-54
Recreation-Related Business Owner Summary

QUESTIONS	Business Owners *(Numbers Correspond to Names Below)*											
	1	2	3	4	5	6	7	8	9	10	11	12
Length of Time Business in Operation (years)	6	15	30	4	7	3	11	55	6	5	16	13
Customer Origin	local	both	non local	both	both	both	non local	non local	non local	non local	non local	non local
Main Destinations of Customers	In the project area, Lake Almanor and Butt Valley Reservoir were the top destinations. Additionally, Lassen Volcanic National Park was among the top three visited sites.											
Customers' Choice of Businesses	Fifty percent chose a business for its knowledge or experience and 50 percent chose it business for its merchandise. Additionally 25 percent chose the business due to the area's resources.											
Important Project Sites for Customers	Extremely Important: Lake Almanor (1); Not Very Important: Belden Reach (4), Butt Valley Reservoir (2.8), Seneca Reach (3)											
Owner's Impressions about Facilities	▪ Keep west shore ramp open in winter; Need public ramp on east shore Lake Almanor ▪ More restrooms available to boaters would be an improvement ▪ Lake levels low, campgrounds too close to Lake Almanor ▪ Discontinue driving on beach shore ▪ Need more camp areas, showers and boat ramps ▪ Access to Lake Almanor needs improvement ▪ Boat ramp at Butt Valley Reservoir needs to be fixed											
Limiting Factors for Businesses	Reponses to business expansion were rated as per the following: Limiting Factors, Room for Potential Expansion, Incentive to Expand, and Type and Character of Future Planned Expansion. Several of these businesses are field based and thus some of the following questions about facilities expansion do not apply.											
Expansion Potential for Businesses	Respondents were asked about expanding their businesses and the majority stated they did not have plans to expand. Of the 12 respondents who returned surveys, eight supplied responses for this question. Reasons given as factors limiting expansion include: low income to disposable cash ratio for residents and visitors; near retirement (presumably do not want to bother); facilities (presume lease does not allow or property is already built to capacity); and business is a home business. Respondents were asked how much room they had for potential expansion. Of the 12 owner/operators who replied, four responded to this question. Responses ranged between "none" to "three-fourths of an acre." Respondents were asked what would prompt them to expand. Of the 12 owner/operators who replied, two responded to this question by stating an "increased flow of tourists" and "more business" would provide appropriate incentive to expand their current facility.											

QUESTIONS	Business Owners *(Numbers Correspond to Names Below)*											
	1	2	3	4	5	6	7	8	9	10	11	12
Planned Expansions of Businesses	Respondents were asked what is the type and character of their future planned expansion. Of the 12 owner/operators who replied, four responded to this question. Responses ranged between needing to store recreational equipment such as snowmobiles (presumably a garage–type structure); switching from rented property to purchasing land; and providing guide services in lakes that currently do not have water if they once did.											

1. Corey's Auto and Equipment Repair
2. Peninsula Sports and Marine Service
3. Roger's Guide Service
4. Hook and Line Fishing Guide Service
5. Bodfish Bicycles and Quiet Mountain Sports
6. Baiocchi's Plumas-Sierra Troutfitters
7. Anastasia Fishing Guide Service
8. Ayoob Ace Hardware
9. Dr. Del's Fly Shop
10. Big League Outfitters
11. The Sports Nut
12. So Bored

Source: EDAW, Inc.

E5.2.1.7 Focus Group Interviews

E5.2.1.7.1 Introduction

The need for the Focus Group Interviews was identified during a late summer 2001 meeting of 2105 Committee (Advisory Group to the Plumas County Board of Supervisors), when concern was expressed that particular groups of Chester residents might not be adequately represented in studies conducted during the 2001 recreation season. Therefore, an effort was made to identify these groups and invite them to participate via Focus Group Interviews. The interest groups were identified from suggestions offered by members of the 2105 Committee. Groups identified consisted of local teens, seniors and people with disabilities, anglers, hunters, winter recreation users, and recreational boaters.

E5.2.1.7.2 Methods

E5.2.1.7.2.1 Identification of Focus Group Interview Participants

With the help of the 2105 Committee, individual community members and user groups were identified representing each group.

These individuals were asked if they know others who shared their recreational interests and who would be willing to participate in an interview. The focus groups that were included are teens, boaters, anglers, hunters, winter recreationists, and seniors with disabilities.

Additional participants were identified through a "snowball" technique, which is commonly utilized by ethnographic researchers. This participatory research method builds on community networks and knowledge, beginning with the identification of one person (or persons) who represent a particular interest. From local networks, larger groups representing specific interests were identified to participate in discussion-driven group interviews. This methodology is not meant to generate a representative sample of the community, but instead encourages participation of specific groups that may not otherwise have the opportunity to participate via traditional social survey sampling methods.

E5.2.1.7.2.2 Focus Group Interview Process

An outline of focus group questions was prepared prior to the interviews, but typically the participants were involved enough with the discussion that asking outlined questions was unnecessary.

All focus groups met during evening sessions on four nights, from September 15-20, 2001. Groups met at the conference room in the Almanor Basin Community Center in Chester.

Focus group interviews typically lasted from 1 to 1.5 hours, and ranged in size from four to 15 participants.

E5.2.1.7.3 Focus Group Interviews Results

The following section describes the findings from the interview process. Results are discussed by focus group.

E5.2.1.7.3.1 Teen Group

Four teens (ages ranging from 14 to 17) from a group at the Almanor Basin Community Center attended the first focus group meeting. The teen group facilitator and center director was also present for the interview.

Barriers to Recreation Access

The teens interviewed could not be characterized as having high levels of involvement with outdoor recreation in the area. All those present indicated that their recreation access to Project recreation sites was limited simply because of transportation difficulties. Except for the 17-year-old, the constraint on recreation for the three other teens was that they did not have drivers' licenses. The 17-year-old cited two barriers to Lake Almanor: the high cost of gas and access to transportation.

Local Teen Activities

Teens were asked what they do for recreation in Chester. They indicated that their recreational lives were largely focused on extra-curricular activities (drama and sports) at the high school.

Other than school activities, the four said that they like to spend time with friends, go bowling, and they also enjoy simply hanging out at the grocery store. The distant towns of Chico and Susanville are also recreation destinations for group, and the teens indicated that they usually go there for both shopping and entertainment.

When asked about specific outdoor recreation activities, the group indicated that they did not participate much in outdoor recreation in the immediate Chester vicinity, but after some discussion, two activities surfaced as something they enjoyed at fairly regular frequencies. One teen reported fishing in the river and another said that she often used the Lake Almanor Recreation Trail (LART) (every other week). The group's coordinator said that many of Chester's teens use the open space off of First Avenue for recreation. Also, some go out to the Feather River and Domingo Springs road for bicycling. When asked about recreation areas across the SR 36 causeway, the teens indicated that the route was considered too dangerous to use as an access road to recreation areas in the immediate Chester vicinity.

Three of the teens present at the meeting had been to Seneca Reach at least once previously, and one of the teens' parents is a recreational miner with a claim at Seneca Reach. She reported occasional visits there, but with no regularity. The teens present

indicated that the recreation areas at the country clubs, Lake Almanor Country Club and Lake Almanor West Country Club, were particularly exclusive, and that they felt unwelcome there. One of the teens had lived at Lake Almanor Country Club at one time.

Impressions of Lake Almanor

When asked if they had a sense of the local impression of Licensee's management of Lake Almanor, the lake level was a salient resource management issue for all of them, and all had particularly negative feelings toward Licensee for this reason. Their impression was that the lake was unusable with almost no water in it. It is unknown if this comment reflected the historical low pool level of 2001 during the drought, or whether this comment referred to all years.

Un-Met Recreation Demand

The teens were asked if there were recreation activities they would like to do in the area, but cannot. They expressed interest in being able to go camping more often (this was an opportunity issue, not a facility issue, although they continually raised the issue of costs of campgrounds as a constraint). Having a sandy beach to go to "to hang out" was a desire that all expressed. One boy in the group indicated that the rocky character of Lake Almanor beaches was a negative attribute. Beyond having access to sites for swimming, the teens also asserted that they wanted sites where swimming and fishing activities were separated physically. This was the only area of recreation conflict that the teens expressed. Generally, the teens were interested in any way to make access easier for the

people of Chester. Indeed, they wanted to create a site for "Chester residents only" in an apparent response to feeling excluded from the nearby country club recreation areas.

Later in the interview the teens again brought up the desire for a place to hang out "close" to Chester. When asked how far "close" was, the 17-year-old said, "within walking distance, or a place where you can ride your bike."

When areas on the northern shores of Lake Almanor were mentioned as possible access sites, one of the teens explained again that the causeway was considered too dangerous by parents for accessing the eastern side of the lake on foot under the existing conditions with no trail.

When asked about other un-met recreation demand interests, the teens focused on a desire for in-town facilities. Three facilities were discussed by the group as being highly desirable. These included a community swimming pool (there is a local funding effort being conducted for this), a skateboard park, and a teen center. By the end of the conversation, a teen center seemed to garner the most interest.

E5.2.1.7.3.2 Boater Group

Nine area residents comprised the boating focus group, and all were year-round residents of the Almanor Basin. Four members of the group identified themselves as property owners in the Lake Almanor area, while four other group members identified themselves as representatives of businesses directly associated with Lake Almanor, including diving

services and resorts. A Plumas County Sheriff's Department Marine Patrol Deputy attended the meeting, as well. About half the group indicated that they used the reservoirs in the Project area for fishing. Diving was the next most common recreation activity.

Boating Demand

Participants in the boating group were asked to talk about the level of demand for boating opportunities on Lake Almanor. Members of the group felt that boating use levels have been increasing steadily in recent years, but have likely stabilized over the last 5 years. Their impressions were that boating use levels were down this year. Anglers in the group indicated that lower lake levels have provided better fishing this year. Some of the group members felt that boating use on the lake is well below capacity overall, but that it is perhaps at or beyond capacity on summer holiday weekends only.

Public Access Issues

Boaters were asked about their concerns for general public access to the lake. One group member indicated that the boat ramp at Lake Almanor Country Club 1 was the only private ramp on Lake Almanor that is currently operational. One of the members of the group who resides at Lake Almanor West Country Club indicated that the club's association was hoping to extend their ramp in the future to avoid low water problems that had been experienced in 2001. Other members of the group indicated that it is difficult to get permission to do such work, with a "yes you can, no you cannot" response from the Licensee and FERC for approval for such projects. Some of the group members

discussed the negative effect that the construction of the LART had on public access to the shoreline in the Prattville area. Previous access to this area was likely by vehicle, but it is still possible to drive down onto the shoreline in some areas.

Recreation Conflicts

When group members were asked whether or not they had experienced any conflicts at their boating sites, they felt that there were little boating conflicts on Lake Almanor and Butt Valley Reservoir. One participant brought up a concern over the potential for oil spills on the lake, and he thought that Licensee should supply a containment boom to have available for use by emergency services personnel if such an accident ever occurred in the future.

Lake Levels and Lake Safety

When the group was asked to talk about the role that lake levels play on boating on Lake Almanor, participants brought up numerous instances of having to pull their docks out early this year because of the low pool level in 2001, and they explained that this shortened their boating season considerably. There was a consensus among group members that Lake Almanor had not been this low since the 1970s. Boat access was cited as a primary concern with lake levels, and some group members felt that this negatively affected the local recreation economy, including golf courses.

Safety was cited as another primary concern related to lake levels, with increased prominence of the three main islands in the lake, and an increase in the number of hazard

logs or "deadheads." Group members mentioned that there are several logs near the lake surface with one end attached to the lake bottom which pose a hazard to boaters. One participant came up with the idea of publishing the location of known hazards on the "Collins Map" as a way of increasing boater safety on Lake Almanor.

Another participant suggested that a placement of lights on the tip of the Lake Almanor Peninsula and Goose Island (the most prominent island) would aid navigation in the dark, particularly during search and rescue operations. He reported that in his experience, it is extremely difficult to know where one is on the lake's surface on a dark night.

Another hazard discussed by participants in the boating focus group was the existence of numerous old dock anchors on the lake bottom. Participants described these anchors as cement-filled metal barrels with re-bar extending out from the sides. Participants indicated that these are located primarily off the shore of Lake Almanor Country Club homes. No other indications were made of the exact locations of these hazards, nor of their extent.

Impressions of Water Quality. One resource quality issue that came up with discussion of lake level was water quality. One of the two divers in the group felt that the algae content in the lake was worse this year than in the past. He indicated that he had experienced a lack of clarity in the northwest portion of the lake, and that water quality problems were spreading outward from the Chester end of the lake. Another group member felt that water quality in the lake was high, and reported water clarity up to 25

feet-deep. Focus group participants felt that when lake clean-up issues arise in the future, the Licensee should play a more active role in any clean-up efforts.

Improving Boating Opportunities. When asked about options for improving opportunities for boating on Lake Almanor, discussion centered on the possibility of removal of hazardous stumps from the lake bottom. Members of the group felt that this year would be a good time to identify such stumps. One of the participants indicated that the 4,485-foot elevation (Licensee 2000b) was the minimum lake level that should be held through Labor Day Weekend, for boating purposes.

Latent Boating Demand Issues

Participants in the boating group were asked to identify recreational activities that they would like to do in the Project area, but cannot. A discussion relating to the addition of access facilities at the lake followed, including one member who expressed the desire for a marina to be built at Lake Almanor West Country Club just south of the current ramp. Some of the group members felt that there would be increased need for an additional boat launch with the construction of Dyer Mountain ski and recreation facilities. They felt that Dyer Mountain would generate enough additional visitation that one boat launch and "plenty" of parking would be necessary.

Overall Boating Issues

Boaters in the focus group expressed a general concern about over-regulation. As much as they wanted to have increased safety on Lake Almanor, they would not like to see an increase in the numbers of regulations in the area.

For example, some members of the group were concerned about access for snowmobiles on the exposed winter shore and were also concerned about future snowmobile access, particularly in relation to the policy about vehicles below the 4,494-foot high water line of Lake Almanor (Licensee 1997). The general sense was that the members of this group would like to see recreational opportunities stay as they are at the present time in terms of levels of use and overall character of experience.

E5.2.1.7.3.3 Angler Group

Seven people attended the angler focus group meeting, with two of the participants arriving fairly late in the interview; the results of the discussion are almost solely from the five other participants. Of these five, four were from the Lake Almanor Country Club Fly Club. The initial five participants identified themselves as fly anglers, while the latter two identified themselves as homeowners from Prattville.

Angling Access Issues

The primary concern of the four fly club members was access to the Lake Almanor shoreline. Issues discussed by the group centered on four areas around Lake Almanor: Catfish Beach, Gould Swamp, the intake tower area at Prattville, and the lake area to the north of the SR 36 causeway.

The fly club members expressed concern over the gating of access to Catfish Beach. There was particular emphasis on how difficult it is for older fly fishermen to get to the area they traditionally use to go fishing.

The access issue was framed as a breaking of a verbal "treaty" that a shoreline interest group (not identified) had made with Licensee land managers at Lake Almanor a number of years ago. Apparently, a promise was made that there would be no shoreline closures. There seemed to be a lack of knowledge about why the Licensee had to close this and other areas for resource protection purposes.

One of the fly club members also expressed anger over the closure of the old access road (an old road from pre-inundation) on the peninsula of land off of the North Shore Campground in the Gould Swamp area. He said that when the Licensee was asked for a reason for the shoreline closure of the road, that its rationale was not convincing. Another angler cited the barriers near the intake tower at Prattville as preventing use of the best single small mouth bass fishing hole in the lake.

When asked what alternatives to the present closures of these areas would be acceptable, suggestions included allowing vehicle access to the high water mark at Catfish Beach, but not beyond it. Other suggestions for the Catfish Beach site included putting signs at the tree line near the beach which indicate a vehicle closure beyond the signs themselves.

Anglers also expressed a concern over retaining access to areas north of the SR 36 causeway east of Chester. Concerns about the lake area north of the causeway focused mostly on the potential long-term effects of cattle grazing in the area, as well as the lack of water and its effect on insect life.

There was the sense among anglers at the meeting that there is no way to maintain or control lake level in this area because of efforts to a keep fish passage open through to the main part of the lake.

Lake Level Effects on the Hex Fly

Concerns over lake levels involved its effects on the hex fly. The anglers felt that the rising and lowering of lake levels has long term negative effects on the hex fly hatch, which is a major local event. They cited concerns over the inability of the hex fly to recover from drawdowns at Butt Valley Reservoir when work was done on the dam there in the 1990s.

Angler Recreation at Butt Valley Reservoir

Anglers also discussed concerns over fishing opportunities at Butt Valley Reservoir, and were critical of the depth and angle of the Alder Creek boat ramp, saying it was too shallow to use. They felt that the old boat ramp at the campground (now closed) had a more appropriate grade, and that the Alder Creek DUA/Boat Launch should be restructured. The quality of fishing at Butt Valley Reservoir was discussed as being a particularly positive aspect of angling opportunities in the area, and anglers participating

in the focus group felt that management activities should be carefully reviewed to ensure that they do not impact the fish population or angling opportunities at Butt Valley Reservoir negatively. One of the anglers expressed a concern over abuses of night fishing at Butt Valley Reservoir, saying that such a valuable fishery may need extra management presence or protection.

E5.2.1.7.3.4 Winter Recreation User Group

Twelve area residents attended the winter recreation focus group session, and the primary interest of those present involved recreational opportunities for snowmobiling in the Chester area. About half of the group members were members of the local snowmobile club, two were resort owners on Lake Almanor, and two others were business owners in Chester.

Access for Snowmobiling

When asked about the areas that participants accessed during the winter months for recreation, those present indicated their primary snowmobile routes by marking them on a map of the area. The primary concern of the group was in the increase of access by gaining rights-of-way (ROWs) across private land in the northern reaches of Lake Almanor. The areas around the northern narrows of the lake in the Chester locale, as well as the northeastern area of the lake, were the primary focus of access concerns for the group. Questions arose relating to the ownership of these lands and it was the sense of some of the group members that this was Beatty and Collins Pine land. Where possible, snowmobilers expressed the hope that the Licensee would assist in granting snowmobile

ROWs in the area. A Forest Service representative at the meeting asserted that if the Licensee could give ROWs in this area, this would create an opportunity for the Forest Service to obtain grant money to promote development of snowmobile routes near Chester.

Conflicts with Other Users

When asked about potential conflicts with other uses, the group indicated no conflicting uses with other forms of winter recreation. There was concern over future possible restrictions to access, particularly as it relates to Licensee lands, which are presently open. Gates were less a concern of the snowmobilers, who indicated that in higher snow years they simply ride over them on the snow. The access issue also was expressed in terms of the ease with which winter tourists will be able to use the area. The local sense was that they are able to get where they wanted to go simply because they know the area so well. However, they asserted that visitors who are confronted by access restrictions might be frustrated, and therefore less likely to return. Some of the participants indicated that the low pool level created additional access for snowshoeing (an activity increasing in popularity, they said) and cross-country skiing because of the added shoreline area.

Un-Met Demand for Winter Recreation

Group members were asked to indicate whether there were winter recreation activities they would like to participate in the Project area, but are unable to at present. One of the group members indicated that it would be favorable to have an ice skating area located adjacent to the First Avenue area in Chester. This area has received interest from other

recreation interest groups as a gateway or link between Chester and the shore of Lake Almanor. The idea of construction of a bike path in this area was also discusses as having value during the winter months in terms of improving the community's access to the lake.

Two of the resort owners who participated in the winter recreation focus group indicated interest in providing winter resort and recreation services during the winter months, including snowmobile rentals and guided snowmobile tours. They said that these services are currently not offered in the Chester area, and could add to the growth of the winter tourism in the area.

E5.2.1.7.3.5 Hunter Group

Five area residents attended the hunting focus group. This number may have been influenced by the timing of the meeting, which coincided with a televised address by President Bush. Four of the five men attending the group identified themselves as affiliated with local hunting groups, including Plumas Fish and Game Commission, Ducks Unlimited, California Waterfowl Association, and the Westwood Gun Club.

Opportunities for Waterfowl Hunting

Discussion of hunter issues focused primarily on opportunities for waterfowl hunting in the northern area of Lake Almanor. The overall sense of what the hunters wanted to say about the resource was that the area cannot support a duck population without proper habitat (both hunting and non-hunting habitat). Several participants indicated that, in

good water years, goose nests flood in the area north of the SR 36 causeway, and when water levels remain high throughout the winter, this creates ideal breeding habitat. The members of the hunting group were highly engaged with ideas about how to create wildfowl habitat just east of Chester in the Lake Almanor section to the north of the causeway.

The group wondered whether there was any way that this area could be converted into a separate wetlands habitat area, where water could be left in the section of the lake, and where islands could be constructed for birds to use for breeding. The group asserted that the creation of additional bird habitat would not only attract hunters to the area, but would also be a magnet for birdwatchers, and would also be useful to area schools for education.

Additional recreation and access facilities were discussed, again focusing on the potential for habitat enhancement north of the Lake Almanor causeway, but hunters were also interested in facilities that duck hunters use at Butt Valley Reservoir. Questions involving habitat enhancements on the west side of Butt Valley Reservoir were discussed. Hunters felt that such enhancements would be a positive addition to the lake for hunters—especially relating to plans to support waterfowl habitat.

Boat launch improvements in the area were also supported, with one hunting participant noting the Forest Service plans to improve the Almanor Boat Launch in the near future. When asked about the potential for Catfish Beach on Lake Almanor to support increased

development, the preference of the hunters was that access should be kept back enough to keep vehicles from beating up the shoreline areas. They favored keeping access to the Gould Swamp area difficult enough that only those who really want it will be able to get there. Several of the hunters present felt that maintaining public access to the Project area was a critical concern of their recreation community.

Hunting, Wildlife, and Recreation Conflict

When asked about conflicts in the area, the hunters brought up issues with cattle grazing in the lake and meadow area to the north of the causeway, and felt that cattle may negatively affect wildfowl habitat. Other activities in the area that may have a negative effect on habitat include OHV and motorcycle use. Use of OHVs along the shoreline at the area where the Super Ditch meets Lake Almanor was also discussed as a conflict area in terms of disturbance of wildlife habitat.

E5.2.1.7.3.6 Seniors and People with Physical Disabilities Group

Originally, the number of seniors and people with disabilities identified from the Chester area were so few that researchers decided to combine the two groups into a single focus group. However, this group actually ended up having the largest attendance of all the focus groups, with 15 area residents participating. One of the group members arrived in a wheel chair, and many of the group members were from a local senior group.

This group provided a list of activities that they felt would improve recreation for seniors in the Chester area, but these were programmatic in nature and not related to recreation

facilities. Two of those attending were members of the Almanor Recreation and Park District, and three worked with seniors and people with disabilities through local human services, including Wildwood Senior Housing, and the Mountain Caregiver Resource Center.

Area Recreation

Discussion of the seniors/people with disabilities group began with discussion of recreation activities that the group participated in throughout the Project area. Those mentioned by the group included driving for pleasure and viewing scenery, sailing, water skiing, walking, and fishing.

Accessible Recreation and Un-Met Recreation Demand

Group members discussed one public access site lost to general public use years ago was the site now leased to North Shore Campground. One individual in the group explained that while there has been a transition in the area from a timber-dependent community to one based more on tourism and recreation, the local population is an aging one in need of recreation sites with universal access per the American with Disabilities Act (ADA). Another group member indicated that many people with disabilities already come to the area and do use accessible recreation sites in area campgrounds.

When asked about recreation facilities in the Project area, several group members said that boat launch and swimming areas have not been upgraded to ADA standards. One group member felt that if sites are signed as universally accessible, that this should mean

it is up to standard. She indicated that there are a number of restrooms around Lake Almanor that were probably standard at one time, but are no longer considered so by newer ADA standards.

The group was particularly enthusiastic about the construction of a walk and bike trail in the First Avenue area between Chester and the northwest shore of Lake Almanor. There was also discussion on the addition of universally accessible fishing sites in the area. The participant in a wheelchair had been to the accessible fishing site at Canyon Dam DUA, but said that the site is far back from the water (the Forest Service plans to extend this ramp soon). Several members of the group felt that an accessible fishing site at Butt Valley Reservoir would be favorable, particularly at the far end of the lake near where the old operator's house was located. One member of the group also brought up the idea of creating water access from Chester to Lake Almanor at the area known as Goose Bay at the west side of the lake.

Another area where one group member felt facilities could be added to the lake was the Prattville Jetty site (old Almanor Inn area). He felt that seniors and people with disabilities would use the site if it were improved. Several group members brought up the issue of local organizing to raise funds for a community pool in Chester. They wondered what possibilities existed for the Licensee to contribute to such a project. One member of the group said that a surprising number of children in Chester do not learn to swim because of the lack of access to proper swim facilities.

Additional Resource Management Concerns

Other resource issues brought up by the group included erosion control measures in streams flowing in to Lake Almanor, the role that cattle grazing near the lake plays in water quality, and the need for a unified plan for the Almanor Basin.

The group member who brought up the issue of a unified basin management plan was concerned that the Licensee may be exploiting recreation and land use to justify any activities that would maximize power generation.

E5.2.1.7.4 Discussion of Focus Group Interviews

The amount of people in each focus group ranged significantly with only four in the teen group, and up to 15 in the seniors/people with physical disabilities group. The overall impression of Lake Almanor, from all focus groups, revolved around the issue of water level, not only for the recreational users but also for associated wildlife. There was some concern that low water levels made the lake unusable and reduced boater use. However two groups thought that the low levels were better for fishing (anglers) and helped access for winter recreation. Additionally, there were concerns for protecting the lake and its shore from cattle grazing and OHV use to protect wildlife habitat.

There was very little consensus on primary activities, yet the teen group, boaters, anglers, and seniors/people with physical disabilities noted fishing as a primary activity. Other primary activities ranged from snowmobiling to waterfowl hunting to driving. When asked about recreation demand/conflicts the issue of shoreline access was mentioned the

most. Boaters, anglers, winter recreationists, hunters, and seniors/people with physical disabilities groups all mentioned some sort of shoreline access issue.

However, in all cases, this did not indicate the need for more facilities except in the case of seniors/people with physical disabilities who stated that ADA-accessible fishing access sites at Lake Almanor and Butt Valley Reservoir would be useful, and the anglers who asked for vehicular access with signage to the high water mark at Catfish Beach. The boaters did think there was a future need for a marina and associated infrastructure capacity at Lake Almanor. The teen group, instead, focused on the need for certain facilities such as a pool, skateboard park, teen center, and a sandy beach. These and other summary issues taken from the focus group interviews are summarized in Table E5.2.1-55.

E5.2.1.8 Discussion of All Surveys

This section discusses the results of the Questionnaire Survey. As outlined in detail above, four main surveys were conducted:

- Recreation Visitor Survey;
- Area Resident Survey;
- Recreation-Related Private Business Owner/Operator Survey; and
- Focus Group Interviews.

Table E5.2.1-55
Focus Group Interview Summary

GROUPS	ISSUES			
	Barrier to Access	**Primary Activities**	**Impressions of Lake Almanor**	**Recreation Demand/Conflicts**
Teen Group				
Four teens/two facilitators	Lack of driver's license/Too young to drive	Extra-curricular Bowling Hanging out Shopping Entertainment Fishing Bike trail use	Water level made Lake Almanor unusable Rocky shore undesirable	Sandy beach Town of Chester facilities such as pool, skateboard park, teen center
Boaters				
Nine residents, four business owners, Plumas County Sheriff's Department Marine Patrol	Ramp extension limited by Licensee Bike path limited shoreline access (Prattville only) Remove hazard stumps	Angling Waterskiing Boating for pleasure Diving	Lower lake levels better for fishing but reduced boater use Beyond capacity on weekends only Safety issues w/low lake levels Mixed water quality opinions	Limited conflicts Oil containment boom an option Future need for additional marina, boat ramp and associated parking capacity
Anglers				
Five fly fisherman/ two residents	Gating to Catfish Beach limiting Old access road closure on peninsula Barriers near intake tower at Prattville area Alder Creek ramp is to shallow to use	Fly-fishing Bait fishing Lure fishing	Long-term effects of cattle grazing Effect of lack of water on insects and fluctuation effect on hex fly hatch Quality of fishing at Butt Valley Reservoir is good and should be protected	Allow vehicular access w/signage to high water line at Catfish Beach Retain access to areas north of SR 36 causeway
Winter Recreation				
Six snowmobilers, two resort owners, two business owners	ROW agreements are important; need more easements from Licensee	Snowmobiling predominantly Cross-country skiing Snowshoeing	Low lake level helps access for snowshoeing and cross-country skiing	Bike path can improve winter access to lake Ice skating area desired Add snowmobile rentals and tours

GROUPS	ISSUES			
	Barrier to Access	**Primary Activities**	**Impressions of Lake Almanor**	**Recreation Demand/Conflicts**
Hunters				
Five residents	Increase habitat, wetlands for more hunting, birding, education Improve existing boat ramps Leave Gould Swamp access in tact without improving	Waterfowl hunting	Keep vehicles from shoreline at Catfish Beach Cattle grazing, OHV and motorcycle use in lake, on shoreline and adjacent meadows have negative impact on wildfowl habitat	Maintain overall public access to project area
Seniors/People with Physical Disabilities				
Fifteen residents (one in wheelchair)	Shoreline access closed by opening of North Shore Campground many years ago Boat launch and swimming areas not ADA-accessible	Driving for pleasure Viewing scenery Sailing Waterskiing Walking Fishing	Walk/bike trail positive New ADA-accessible fishing ramp is too far from water Erosion into lake, cattle grazing, need unified plan	Add fishing access at Butt Valley Reservoir Provide water access at Goose Bay Need public pool

Source: EDAW, Inc.

All of the groups were asked questions to find the most relevant, recreation-based information, yet this involved asking different questions to each survey group. Survey methods varied as well, as certain surveys were asked on-site, others were mail-back, while specific focus groups were created to try to find a consensus on current, as well as possible future developments. The following is a summary broken down by issues and activities that were common to all the survey groups in the Questionnaire Survey.

E5.2.1.8.1 Issues

E5.2.1.8.1.1 Most Popular Recreation Area

Visitors to the Project Area

The Recreation Visitor Survey asked which recreation area respondents visited the most. Lake Almanor was the most popular response with 99 percent of Lake Almanor visitors, 56 percent of Butt Valley Reservoir visitors, and 25 percent of Belden Reach visitors noting it was the place they generally visited. The survey also asked which recreation area in all of northern California is most favored.

Once again, Lake Almanor was listed most frequently with 72 percent of Lake Almanor visitors, 6 percent of Butt Valley Reservoir visitors, and 6 percent of Belden Reach visitors noting it as their favorite recreation area in northern California.

Area Residents

When asked what area they visited most frequently for recreation, 98.5 percent of Area Resident Survey respondents noted Lake Almanor. All other Project areas received less than a 1 percent response.

Private Business Owners/Operators

When asked what was the main destination of their customers, 83 percent of the respondents stated that Lake Almanor was the major attraction for their customers. The Hook and Line Fishing Guide Service stated that, "Lake Almanor is like what Lake Tahoe is to that area."

Focus Group Interviews

The interviews did not specifically address which Project area was the most popular, yet the overall feeling derived from the responses was that Lake Almanor is salient to all of the groups.

E5.2.1.8.1.2 Water Level

The most common issue raised by all survey groups was that of water level. As mentioned previously, however, the survey season was one in which the low lake levels may have never been experienced by respondents before.

Many factors contributed to this, however 2001 was a year in which there was below average precipitation causing drought conditions as well as record high consumer energy demands, causing the need for increased power generation. These factors may have affected respondents' experiences, and thus their responses were based on abnormally low pool levels at Lake Alamanor.

Visitors to the Project Area

During the on-site portion of the Recreation Visitor Survey, when asked about the water level and how it affected their ability to enjoy the lake, 15 percent of Lake Almanor visitors noted that it was totally acceptable, while 44 percent at Belden Reach and 58 percent at Butt Valley Reservoir responded the same. The same amount of responses from Butt Valley and Belden Reach were recorded regarding the effect of water levels in regard to safety and enjoyment, while 17 percent of Lake Almanor respondents felt that the water levels were totally acceptable for safety purposes. The mail-back question on

perceptions of problems with conditions led to significantly different responses. Exposed land during lower water levels (43 percent), and shallow areas during lower water levels (42 percent) were considered the biggest problems at Lake Almanor. The 2001 drought likely influenced boater responses to be more negative compared to a normal water year.

Area Residents

All three of the area resident groups felt that water level fluctuations were a problem. Nine out of 10 shoreline residents felt that this was a problem, along with 81 percent of back-lot residents, and 64 percent of towns and environs residents.

Coinciding with the low water levels, exposed land during lower water levels, and shallow areas during lower water levels were also noted as problem issues.

Private Business Owners/Operators

When asked about their impressions of recreation facilities in the Project area, recreation-related private business owners/operators noted that lake levels were too low. They suggested that the lake level be kept up to a certain standard every year.

Focus Group Interviews

Boaters were the only group that responded to the issue of lake level. However, some of the anglers in the group indicated that lower lake levels have provided better fishing.

E5.2.1.8.1.3 Availability of Campsites

Visitors to the Project Area

The Recreation Visitor Survey asked visitors whether they agreed or disagreed with the statement "I can find a campsite at this recreation area when other places are full." Thirty-eight percent of those surveyed at Lake Almanor agreed, while 19 disagreed. (The remainder was neutral or did not give a response.) The percentages agreeing and disagreeing were more disparate at Butt Valley Reservoir, where 55 percent agreed and 18 percent disagreed, and at the Belden Reach, where 48 percent agreed and 26 percent disagreed. Visitors were also asked if they considered the ability to find a campsite to be a problem. At Lake Almanor, 20 percent considered this to be a moderate or big problem, versus 26 percent who considered it to be a slight problem and 36 percent who though it was not a problem. The response percentages from Butt Valley and Belden Reach visitors were roughly similar. Finally, visitors were asked if they felt the number of campgrounds was too low, too high, or about right. Forty-three percent of those surveyed at Lake Almanor indicated too low (4 or 5 on a scale where 1=too high, 3=about right, and 5=too low), with a mean score of 3.6. In comparison, only 19 percent at Butt Valley Reservoir and 28 percent at Belden Reach felt the number of campgrounds was too low. Overall, these survey data suggest that there is some concern about campsite availability at Lake Almanor, but the concern is not held by a majority of visitors there. Lower proportions of visitors at Butt Valley Reservoir and the Belden Reach considered the availability of campsites to be inadequate.

Area Residents

Similar to visitors, area residents were asked if they considered the ability to find a campsite to be a problem. Among towns and environs residents, 25 percent considered this to be a moderate or big problem, versus 21 percent who considered it to be a slight problem and 34 percent who though it was not a problem. Twenty percent were unsure or offered no opinion. The percentages of back-lot and shoreline residents concerned about this issue were substantially lower, with 14 percent of back-lot and 5 percent of shoreline residents considering it to be a moderate or big problem. (Forty-four percent of back-lot and 57 percent of shoreline residents indicated they were unsure or offered no opinion.) When area residents were asked if the number of campgrounds was too low, too high, or about right, less then one-quarter of the shoreline or back-lot residents said too low. (Once again, the percentages of these groups offering no opinion were high at nearly 40 percent.) In contrast, 46 percent of towns and environs residents felt the number of campgrounds was too low. Overall, most area residents have no opinion about campsite availability, or consider it to be adequate.

Private Business Owners/Operators

Private Business Owners/Operators were asked about their impressions of Project facilities. One of the 12 business owner/operators surveyed expressed the opinion that Lake Almanor needed more camping areas. No other responses or comments specific to campsite availability were given.

Focus Group Interviews

None of the six focus groups (teens, boaters, anglers, winter recreationists, hunters, seniors/people with physical disabilities) brought up concerns related to campsite availability during interviews addressing their use of the Project area and perceptions of recreation demand and facility needs.

E5.2.1.8.1.4 Showers/Restrooms

Visitors to the Project Area

Three-quarters of Lake Almanor respondents, along with 84 percent of Butt Valley Reservoir respondents felt that there were not enough shower facilities at the campgrounds, and similar results were noted about showers at day use facilities.

Area Residents

Responding to the task of evaluating current facilities and services in the Project area, resident respondents noted that the adequacy of shower facilities at Lake Almanor and Butt Valley Reservoir campgrounds needs to be addressed. The issue of the number of restrooms around the shoreline was a significant issue for all three groups surveyed in the Area Resident Survey.

Over six out of every 10 towns and environs residents felt that this was a problem, whereas 57 percent of back-lot residents and 43 percent of shoreline resident respondents concurred. Along with restrooms, all three groups saw the amount of shower facilities at DUAs as an issue.

Private Business Owners/Operators

When asked comment on project recreation facilities, recreation-related private business owner/operators responded that there is a need for boaters to have more camp areas, showers and restrooms available.

Focus Group Interviews

There were no responses from the focus groups that dealt with the need for additional shower or restroom facilities.

E5.2.1.8.1.5 Access—Trails and Boat Launches

Visitors to the Project Area

Of the respondents to the Recreation Visitor Survey, 72 percent from Lake Almanor agreed or strongly agreed that easy accessibility influenced their choice of the site. Eight out of 10 respondents at Belden Reach, and three-quarters of the respondents from Butt Valley Reservoir felt that accessibility was an important factor influencing their choice of recreation areas.

Area Residents

The number of paved bike trails around Lake Almanor was an issue that approximately 40 percent of all Area Resident Survey respondents said was a problem.

Private Business Owners/Operators

Recreation-related private business owner/operators had numerous comments on the issue of boat ramps. These comments ranged from suggesting a public ramp on the east

shore of Lake Almanor, pointing out a need for more boat ramps, and commenting on the need to improve access to Lake Almanor. It was also suggested that the boat ramp at Butt Valley Reservoir needs to be fixed.

Focus Group Interviews

The most common issue raised by focus group participants was that of boat launches. Seniors/people with disabilities, hunters, anglers, and boaters all felt that the existing boat launches represented a barrier to access.

E5.2.1.8.1.6 Crowding

Visitors to the Project Area

Crowding was addressed by the Recreation Visitor Survey, the Area Resident Survey, and included as an issue of discussion during focus group interviews. Over 50 percent of Belden Reach and Butt Valley Reservoir visitors, and over 60 percent of Lake Almanor visitors, were pleased with the amount of people at the recreation areas. Only 4 percent of Lake Almanor, 5 percent of Butt Valley Reservoir, and 7 percent of Belden Reach visitors felt extremely crowded.

Area Residents

When Project area residents were asked about crowding, 60 percent of all residents stated that they felt slightly crowded or more. About four in 10 stated that the number of visitors did not really affect their enjoyment of the Project area. For shoreline and back-lot residents only about one-quarter indicated that they changed their visits to avoid crowding. The towns and environs residents responded much higher, as over half of

those surveyed noted that they had changed their visits to the Project area to avoid crowding, particularly on holiday weekends.

Private Business Owners/Operators

The Recreation-related Private Business Owner/Operator survey did not touch on the issue of crowding in the Project area.

Focus Group Interviews

The focus groups addressed the issue of crowding; boaters noted that in general boating use on Lake Almanor was well below capacity overall, but that it was beyond capacity on holiday weekends.

E5.2.1.8.1.7 Costs to Use Project Area

Visitors to the Project Area

The Recreation Visitor Survey asked for the "users' evaluation of current developments and services at recreation area." The only response that came back as "too high" was that of "cost of campsites."

The cost to use the facilities was the most recognized problem at Butt Valley Reservoir with 30 percent of respondents perceiving this as a moderate or big problem.

Area Residents

As noted in the Area Resident Survey, the three survey groups did not feel that the cost to use the facilities was a problem. Over three-quarters of the shoreline residents surveyed

felt that the cost to use the facilities was not a problem, along with 70 percent of back-lot residents and 62 percent of towns and environs residents.

Private Business Owners/Operators and Focus Group Interviews

The Private Business Owner/Operator Survey did not deal with the issue of costs to use Project area facilities.

Focus Group Interviews

The focus group questions did not address the issue of costs to use Project area facilities.

E5.2.1.8.2 Activities

E5.2.1.8.2.1 Swimming

Visitors to the Project Area

The activity with the highest overall response from the Recreation Visitor Survey was swimming. It was the top activity for the visitors to Lake Almanor (76 percent) Butt Valley Reservoir (83 percent) and Belden Reach (65 percent).

Along with the on-site responses, eight out of 10 Lake Almanor and Butt Valley Reservoir visitors who completed the mail-back survey, as well as 64 percent of Belden Reach respondents noted that they have taken part in swimming.

Area Residents

The Area Resident Survey did not ask which specific activities individuals participated in while in the Project area.

Private Business Owners/Operators

The Private Business Owner/Operator Survey did not ask business owners which activities they have participated in, or what activities that they think their customers take part in while visiting the Project area.

Focus Group Interviews

Both the teen and the seniors and people with physical disabilities focus groups noted that they felt a community swimming pool was an addition that was needed.

E5.2.1.8.2.2 Fishing

Visitors to the Project Area

When the Recreation Visitor Survey asked visitors which activity they had ever participated in, the common consensus from Lake Almanor (71 percent), Butt Valley Reservoir (83 percent) and Belden Reach (84 percent) mail-back respondents was fishing.

Responding to the on-site survey, over eight out of every 10 Butt Valley Reservoir and Belden Reach visitors, along with 60 percent of Lake Almanor respondents, said that fishing was an activity that they participated in.

Area Residents

The Area Resident Survey did not ask which specific activities individuals participated in while in the Project area.

Private Business Owners/Operators

The Private Business Owner/Operator Survey did not ask business owners which activities they have participated in, or what activities that they think their customers take part in while visiting the Project area.

Focus Group Interviews

The focus group that had the most to say about fishing was the angler group. There were seven people who attended the angler focus group meeting. Five identified themselves as fly fishermen, while the other two identified themselves as homeowners. The fly fishermen expressed anger towards certain areas of the lake being off limits, or extremely difficult to get to. This group noted some concern over the water level of the lake, yet emphasized that the lower water level was a benefit to their fishing. The anglers had concerns and suggestions about how to improve the boat ramp conditions.

E5.2.1.8.2.3 Sunbathing

Visitors to the Project Area

Sunbathing was a common activity at all three locations, as 59 percent of Butt Valley Reservoir, 57 percent of Lake Almanor, and 51 percent of Belden Reach of on-site survey respondents participated in. Similarly, the mail-back responses showed a near or above 50 percent participation in sunbathing.

Area Residents

The Area Resident Survey did not ask which specific activities individuals participated in while at the Project area.

Private Business Owners/Operators

The Recreation-Related Private Business Owner/Operator Survey did not ask business owners which activities they have participated in, or what activities that they think their customers take part in while visiting the Project area.

Focus Group Interviews

None of the focus groups specified sunbathing as an activity that they participated in, nor as an issue that needed to be dealt with.

E5.2.1.8.2.4 Wildlife Viewing/Sightseeing

Visitors to the Project Area

Approximately 40 percent of Lake Almanor, and just over 60 percent of Butt Valley Reservoir and Belden Reach on-site survey respondents noted that they participated in wildlife viewing. Sightseeing was an activity that nearly 60 percent of Butt Valley Reservoir and Belden Reach visitors took part in, while just over one-half of those surveyed from Lake Almanor did the same. About six out of every 10 respondents to the mail-back survey from Butt Valley Reservoir and Belden Reach said they had taken part in sightseeing and wildlife viewing. One-half of Lake Almanor respondents said that they have participated in wildlife viewing, and 68 percent said that they had gone sightseeing.

Area Residents

The Area Resident Survey did not ask which specific activities individuals took participated in while at the Project area.

Private Business Owners/Operators

The Recreation-Related Private Business Owner/Operator Survey did not ask business owners which activities they have participated in, or what activities that they think their customers take part in while visiting the Project area.

Focus Group Interviews

The seniors and people with physical disabilities group noted that sightseeing was a commonly enjoyed activity.

E5.2.1.8.2.5 Boating

The vast majority of responses to all surveys noted that the type of boating that takes place in the Project area is motorboating; although sail boating and kayaking/canoeing are present, they are not yet significant.

Visitors to the Project Area

About four out of 10 visitors to Lake Almanor responded to the on-site Recreation Visitor Survey saying that they participated in motorboating. One-third of those responding from Butt Valley Reservoir noted that they participated in motorboating, while only 1 percent of Belden Reach responses noted this activity. The numbers were slightly higher for the mail-back survey, as 55 percent of Lake Almanor, 42 percent of Butt Valley Reservoir, and 5 percent of Belden Reach respondents noted that they had participated in motorboating. Numerous issues dealing with motorboating, such as boat launch ramps, no wake zones, and speed limits were mentioned in response to both Recreation Visitor Surveys.

Area Residents

In the Area Resident Survey over half of the shoreline residents and back-lot residents (56 percent) felt that noise from boats and PWCs was a problem. Nearly four out of 10 towns and environs residents felt that these issues were a problem. Similar to the issue of noise from boats and PWCs, the issue of boat speed or wake effects saw approximately 50 percent of shoreline and back-lot residents responding. About 40 percent of towns and environs residents also felt that boat speed or wake effects were an issue.

Private Business Owners/Operators

The Private Business Owner/Operator Survey did not ask business owners which activities they have participated in, or what activities that they think their customers take part in while visiting the Project area. However, given the issues that were brought up, it is apparent that boating is an important activity for this group.

Focus Group Interviews

Of all the interviews, the most relevant input on the issue of boating was that from boaters. The group consisted of nine year-round residents of the Almanor Basin. About half of the group indicated that they used Project area reservoirs for angling. Diving was the next most common recreational activity. Some of the group members felt that boating use on Lake Almanor was well below capacity overall, but that it is beyond capacity on holiday weekends. Boat access was cited as a primary concern related to lake levels, and some group members felt that lake levels negatively affected the local recreation economy.

E5.2.2 Existing Recreation Use

E5.2.2.1 Introduction

This section presents the results of the Existing Recreation Use study, one of several recreation studies that were conducted by the Licensee for relicensing.

E5.2.2.1.1 Objectives of the Study

The objective of this study is to estimate existing Project-related recreational use, primarily reservoir recreation. This study is needed since Federal Energy Regulatory Commission (FERC) regulations require estimates of existing and potential recreation use at the Project, in daytime and overnight visitation, as well as a description of the methods used to estimate use (Code of Federal Regulations [CFR] 1998).

This section estimates recreation use and activities at individual developed recreation sites, as well as at dispersed undeveloped recreation sites within the study area. Recreation use was estimated for the primary recreation season for each area (fishing and summer seasons for Butt Valley Reservoir and year-round for Lake Almanor).

As part of assessing existing demand and use levels, this study identified the types, levels, and distribution of use at study locations. Measures used as part of this assessment included seasonal visitation, non-holiday weekend people-at-one-time (PAOT), holiday weekend PAOT, and recreation days (RDs). An RD is defined as a single visit to a recreation area for any part of a 24-hour period. This corresponds to FERC's Form 80 definition of a Recreation Day (RD).

These commonly utilized measures are useful for managers as they consider present conditions while planning for future recreation needs at Project sites.

There are five components to this section:

- Study Area—description of the areas studied;
- Study Methods—description of how the data was acquired;
- Results—description of study findings reported by day use and overnight use, and reported by the four resource areas that comprise the study area;
- Monitoring Program—description of what the Monitoring Program should address and how it will be accomplished; and
- Discussion—description of context and scope of study findings.

E5.2.2.2 Study Area

The study area includes all Licensee, United States Forest Service (Forest Service), and privately-owned developed recreation sites within or adjacent to the FERC Project boundary (see Figures E5.1-1 through E5.1-3). For research purposes, the study area was divided into four resource areas: Lake Almanor, Butt Valley Reservoir, Seneca Reach, and Belden Reach. All discussed study area sites are within one of these four resource areas described below.

E5.2.2.2.1 Lake Almanor

Lake Almanor is located in the northeast corner of the Project area at 4,494 feet (high pool level) above sea level (asl) (Licensee 2000b).

The reservoir offers 27,092 surface acres at full pool (Licensee 1987). There are approximately 52 miles of shoreline for recreational use (Steinstra 2000). The Licensee and the Forest Service have provided four numerous family and large group camping areas at Lake Almanor including:

- Lake Almanor Campgrounds (Loops 1, 2, and 3) (Licensee);
- Camp Conery Group Camp (Licensee);
- Last Chance Campground/Group Camp (Licensee); and
- Almanor Campground (North and South Units) (Forest Service).

The Licensee and the Forest Service have provided a number of day use and picnicking facilities at Lake Almanor including:

- Canyon Dam Day Use Area (DUA) (Licensee);
- Almanor Scenic Overlook (Licensee);
- Eastshore DUA (Licensee);
- Almanor Boat Launch (Forest Service);
- Canyon Dam Boat Launch/DUA (Forest Service);
- Almanor Rest Area (state route (SR) 89) (Forest Service); and
- Dyer View DUA (Forest Service).

There are a number of private resorts and RV campgrounds around Lake Almanor. Most of them provide rooms; some have recreational vehicle (RV) spaces or cabins. Most of them have boat launches and some have boat and personal watercraft (PWC) rentals. Private resorts at Lake Almanor include:

- Almanor Lakefront Village;
- Almanor Lakeside Resort;
- Almanor Lakeside Villas;
- Big Cove Resort;
- Country Club Resorts;
- Dorado Inn;
- High Sierra Resort;
- Knotty Pine Resort;
- Lake Almanor Lakeside Lodge;
- Lake Almanor Resort;
- Lake Cove Resort;
- Lake Haven Resort;
- Lassen View Resort;
- Little Norway Resort;
- Miller's Resort;
- Moonspinners Resort;
- North Shore Campground;
- Novotny's;
- Plumas Pines Resort;
- Vagabond Resort;
- Villager Resort; and
- Wilson's Camp Prattville.

E5.2.2.2.2 Butt Valley Reservoir

Butt Valley Reservoir is located approximately 4 miles south of Lake Almanor at an elevation of 4,140 feet (Licensee 2000b). At maximum pool level, the reservoir has 1,600 surface acres and 49,897 acre-feet of capacity. Opportunities for recreation at Butt Valley Reservoir include camping, fishing, hiking, boating and swimming. Recreation facilities developed by the Licensee at the reservoir are comprised of two campgrounds on the eastside:

- Ponderosa Flat Campground; and
- Cool Springs Campground.

Cool Springs is a fee campground containing 25 camp units and five walk-in units. It is located 2.5 miles south of Ponderosa Flat Campground on the east shore of Butt Valley Reservoir. Located on the north end of Butt Valley Reservoir, Ponderosa Flat is also a fee campground and contains 63 camp units.

The Licensee also provides one DUA and boat launch at Butt Valley Reservoir called Alder Creek DUA/Boat Launch. Powerboats are allowed on the reservoir; however, a Plumas County ordinance prohibits PWC use and waterskiing (Plumas County Visitors Bureau 1998).

E5.2.2.2.3 Belden and Seneca Reaches

There are two recreational river reaches on the UNFFR in the Project vicinity. The upper reach is Seneca Reach; it begins below Canyon Dam and runs south approximately 11 miles to Caribou Powerhouse 1, just above Belden Forebay.

The lower reach is Belden Reach; it begins at the Belden Forebay and runs southwesterly approximately 9 miles to the confluence with the east branch of the UNFFR near SR 70.

E5.2.2.2.3.1 Seneca Reach

Seneca Reach provides dispersed recreational opportunities such as hiking and fishing, and there are also mining operations along the reach. This portion of the UNFFR has restricted access because of the steep, rugged terrain and private in-holdings. There is a county road (CR) that begins at SR 89 near the Lake Almanor Dam and leads to the small community of Seneca. There are no services in Seneca. This CR runs parallel to the UNFFR, but is usually well away and above the river in the canyon. Although the river can occasionally be seen from points along the road, access is generally difficult and by foot only. The CR is only close to the river as it crosses the bridge in Seneca.

There are also spur roads that approach the river in the middle and lower parts of the reach; these are private mining roads (or roads that cross private property) and it is unclear whether recreationists use them.

The North Fork Fishing Trail, a Forest Service-maintained angler trail, travels upstream from Caribou Powerhouse 1 at the downstream end of this reach. The trail appears to be well used and maintained for the first 3 miles or so, and includes two river footbridges.

E5.2.2.2.3.2 Belden Reach

Belden Reach is much more accessible than Seneca Reach. The entire length of the reach runs parallel to Caribou Road (which intersects SR 70). The Forest Service operates three campgrounds along this portion of the river:

- Gansner Bar Campground;
- North Fork Campground; and
- Queen Lily Campground.

Additionally, the Licensee operates Belden Rest Stop at SR 70 and the Belden Powerhouse.

Recreational activities in this area include: camping, fishing, hiking, and swimming.

E5.2.2.2.4 Dispersed Recreation Areas

Researchers identified 12 dispersed sites within the study area that host most of the observed activities. Observed activities included:

- Boat fishing;
- Bank fishing;
- Inflatable boat use;
- Picnicking;
- Swimming and sunning;
- Biking and hiking; and
- Rest stop use.

For descriptive purposes, these 12 dispersed sites were placed into two categories: Belden Dispersed Sites and Butt Valley and Seneca Dispersed Sites. There are additional dispersed sites around Lake Almanor as shown in Figure E5.1-2.

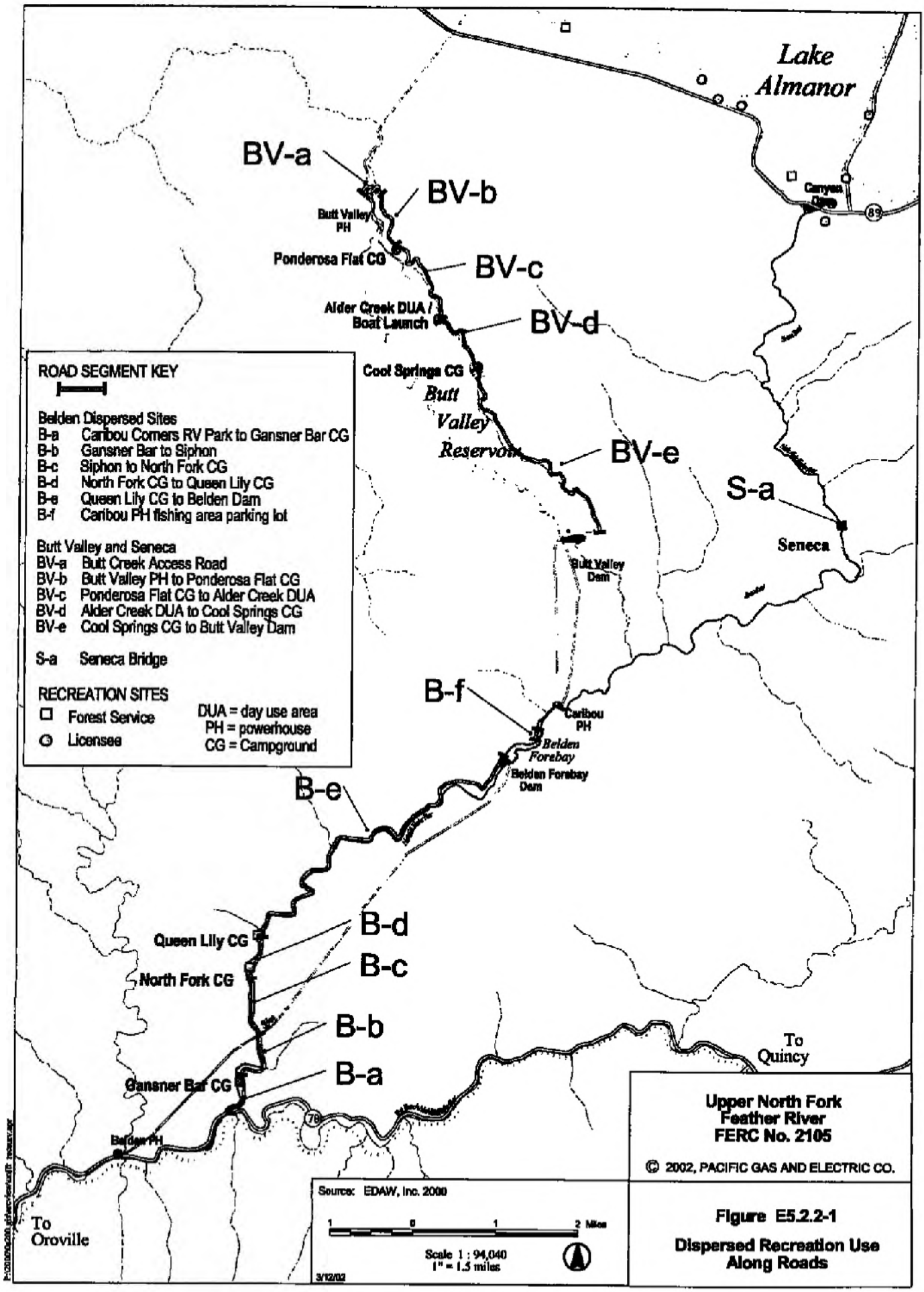
Belden Dispersed Sites begin at the intersection of SR 70 and Caribou Road and stretch to the Caribou Powerhouse 1 parking lot. The following areas comprise the Belden Dispersed Sites' geographical range (code numbers from Figure E5.2.2-1 are included in parentheses):

- Caribou Corners RV Park to Gansner Bar Campground (B-a);
- Gansner Bar to Siphon (B-b);
- Siphon to North Fork Campground (B-c);
- North Fork Campground to Queen Lily Campground (B-d);
- Queen Lily Campground to Belden Dam (B-e); and
- Caribou Powerhouse fishing area parking lot (B-f).

All of these areas are located along Caribou Road.

Butt Valley Reservoir and Seneca Reach dispersed sites stretch from the Butt Creek Access Road to the bridge at the town of Seneca. The following sites are included:

- Butt Creek Access Road (alongside a nameless road between Butt Valley Road and Butt Valley Powerhouse informal parking area) (BV-a);
- Butt Valley Powerhouse to Ponderosa Flat Campground (alongside Butt Valley Road) (BV-b);



- Ponderosa Flat Campground to Alder Creek DUA/Boat Launch (alongside Butt Valley Road) (BV-c);
- Alder Creek DUA/Boat Launch to Cool Springs Campground (alongside Butt Valley Road) (BV-d);
- Cool Springs Campground to Butt Valley Dam (alongside Butt Valley Road) (BV-e); and
- Seneca Bridge (S-a).

E5.2.2.3 Methods

This section describes the various methods used to measure use levels for visitors and activities at the Project. Recreation user counts were assessed at all developed and dispersed sites described below. Researchers used several methods such as observations, interviews, roadside traffic stops, electronic traffic counters, and data provided by Licensee and Forest Service sources to estimate use levels. Measures are categorized by day use and overnight.

The reader is cautioned that use levels, RDs, and occupancy rates reported in this specific study will differ from those reported in the Projected Recreation Use Analysis (E5.2.4) and the Recreation Carrying Capacity Analysis (E5.2.5). A standardized recreation season, for comparison purposes, is used in the Projected Recreation Use Analysis and the Recreation Carrying Capacity Analysis and is defined as mid-May through mid-September. This standardized season also includes all weekdays, weekends, and holidays. In comparison, the data and analysis in the Existing Use Study reflect use that

occurs during the timeframe that public developed recreation facilities are open to the public. These timeframes vary by site and by year due to different opening and closing dates. Occupancy rates at day use facilities reported in this study, which are based on observations of occupied parking spaces during peak use periods, are generally lower than those reported in the Recreation Projected Use and Recreation Carrying Capacity Analysis. This second study used traffic counter information to estimate day use facility occupancy rates. The occupancy information from these two latter studies, with its standardized seasons, was used in making relicensing management decisions and carried into the development of the Draft RRMP (Appendix E5-T).

E5.2.2.3.1 Day Use Visitation

Measures for day use visitation included the following:

- On-site observation surveys at DUAs and dispersed areas during peak use periods to collect PAOT, recreational activity, parking lot occupancy, and picnic table occupancies;
- Traffic and manual vehicle counts at DUAs to estimate RD and recreation visits; and
- Resident mail surveys regarding residential recreation visits originating from residential boat docks. These data are reported in Section E5.2.3.

E5.2.2.3.2 Overnight Visitation

Measures for overnight visitation included the following:

- Campground records provided by the Licensee and the Forest Service to estimate campground occupancy and recreation visits; and
- A business survey to estimate occupancy and recreation visits to commercial resorts.

E5.2.2.3.3 Study Instruments

In general, for all the sites within the study area, researchers obtained use levels on recreation-related vehicles, people, and user activities. The type of form used differed depending on the type of site measured (i.e. campgrounds required different forms than DUAs). The observation forms are provided in Appendix E5-K—Recreation Data Collection Forms.

For the on-site survey, researchers noted the recreation activity visitors were involved in when they were counted. Activity categories are listed below:

- Camping
- Picnicking
- Picnic tables occupied
- Swimming and sunning
- People waiting to launch at boat launches
- People waiting to land at boat launches
- Windsurfing
- Waterskiing
- PWC use
- Canoe use
- Kayak use
- Inflatable boat use
- Bank fishing
- Boat fishing
- Bicycling
- Hiking
- Equestrian use
- Rest stop use
- General recreation.

In addition, the form also had an "other" category for activities not conforming to these listed activities. Field researchers also recorded the types of vehicles used.

E5.2.2.3.4 Data Collection Procedures

As shown in Table E5.2.2-1, 14 survey days for Lake Almanor were completed between April and October 2001. The survey period commenced approximately 1 month prior the first major holiday weekend of the peak visitor season. The sample timeframe ended approximately 1 month after the close of the holiday season on Labor Day.

To ensure that high-use periods were counted, the schedule accommodated the three federal holidays that fell within this timeframe: Memorial Day, Independence Day, and Labor Day.

Additionally, Table E5.2.2-2 is a summary of the Lake Almanor site surveys. These sites were sampled during the months of May, June, July, September, and August. There were a total of 368 surveys conducted on weekdays at Forest Service, Licensee, and private campground, day use area, picnic areas, and boat launch sites around Lake Almanor. There were no surveys conducted on Sundays. The following is a breakdown by site operator:

- There were 91 surveys administered at Forest Service sites;
- There were 223 surveys administered at Licensee sites; and
- There were 54 surveys administered at private sites.

Table E5.2.2-1
Schedule of 2001 On-Site Survey Samples

Field Visit Dates				No. of Survey Days	Day of the Week
Lake Almanor	Butt Valley Reservoir	Belden Reach	Seneca Reach		
28-Apr				1	Saturday
	29-Apr	29-Apr	29-Apr	1	Sunday
11-May		11-May		1	Friday
26-May				1	Saturday (Memorial Day Weekend)
	28-May	28-May	28-May	1	Monday
2-Jun				1	Saturday
23-Jun				1	Saturday
	3-Jul		3-Jul	1	Tuesday
5-Jul	5-Jul		5-Jul	1	Thursday (Independence Day Weekend)
14-Jul				1	Saturday
	10-Jul		10-Jul	1	Tuesday
		15-Jul		1	Sunday
	20-Jul		20-Jul	1	Friday
21-Jul		21-Jul		1	Saturday
	27-Jul		27-Jul	1	Friday
4-Aug				1	Saturday
		12-Aug		1	Sunday
		15-Aug		1	Wednesday
	17-Aug		17-Aug	1	Friday
18-Aug				1	Saturday
		24-Aug		1	Friday
		31-Aug		1	Friday
1-Sep				1	Saturday (Labor Day Weekend)
8-Sep	8-Sep	8-Sep	8-Sep	1	Saturday
15-Sep	15-Sep		15-Sep	1	Saturday
		21-Sep		1	Friday
	22-Sep		22-Sep	1	Saturday
6-Oct	6-Oct		6-Oct	1	Saturday
	12-Oct	12-Oct	12-Oct	1	Thursday
14 samples	13 samples	12 samples	13 samples	29 different dates	N/A

Source: EDAW Inc.

The range of weekday visits for the sites was from 1 to 7. The average for Forest Service, Licensee, and private sites is 3 weekday samples per site.

Table E5.2.2-2
Summary of 2001 Lake Almanor Site Surveys

Lake Almanor sites	No. of weekdays	No. of surveys
Almanor Campground (Forest Service)	7	52
Almanor Boat Launch (Forest Service)	1	2
Almanor Beach (Forest Service)	2	11
Canyon Dam Boat Launch/DUA (Forest Service)	3	16
Dyer View Day Use Area (Forest Service)	2	10
Lake Almanor Campground (Licensee)	5	128
Camp Conery Group Camp (Licensee)	6	82
Canyon Dam Day Use Area (Licensee)	2	5
Almanor Scenic Overlook (Licensee)	1	1
Eastshore Day Use Area (Licensee)	1	2
Last Chance Campground (Licensee)	2	5
Lake Almanor West Boat Launch (Private)	1	1
Lake Almanor West Day Use Area (Private)	3	13
Lake Almanor Country Club No. 1 Day Use Area/ Boat Launch (Private)	4	12
Lake Almanor Country Club No. 1 Day Use Area/ Boat Launch (Private)	5	28
Total	**N/A**	**368**

Source: EDAW, Inc.

E5.2.2.3.5 Calibration of Traffic Counter Devices

As shown in Table E5.2.2-3, traffic counters were calibrated to determine the devices' accuracy. Field staff observed and manually recorded traffic during 4-hour shifts at each of the counter sites and then compared their results with the devices' results. The difference represents the percentage of error (accuracy of the device). In addition to mechanical causes, counter error results from vehicles pulling trailers and large vehicles such as RVs triggering the counter more than once as they pass over it (overcounting). Undercounting will occur if some vehicles can avoid tripping the counter as they enter or leave the area. Vehicle type, whether vehicles were pulling trailers, and vehicles avoiding the counter were observed and recorded. For each device, the percent error was between -10 and +10 percent. Percent error was considered when analyzing the counter data.

Table E5.2.2-3
Schedule of Calibration of Traffic Counters

Date	Site
8-June	Almanor Boat Launch
8-June	Almanor Beach
13-June	Lake Almanor Country Club 2 DUA/Boat Launch
21-June	Canyon Dam Boat Launch/DUA
26-June	Butt Valley North
28-June	Butt Valley North
28-June	Canyon Dam DUA
6-July	Caribou

Source: EDAW, Inc.

E5.2.2.3.6 Manual Traffic Counts

Manual traffic observations were done where there were no automatic traffic counters installed. One field staff person was adequate to undertake the observations in all cases due to the layout of sample sites. Observations were made at each site for 4-hour intervals on selected dates, as shown in Table E5.2.2-4.

E5.2.2.3.7 Measures of Use

Measures of use employed in this study included non-holiday weekend PAOT, holiday weekend PAOT, DUA occupancy rates, campground and overnight occupancy rates, and RDs. Measuring use on holiday and non-holiday weekends is important because these time periods coincide with the highest levels of use that a recreation area or site typically receives. These measures allow recreation planners to determine if carrying capacities at particular sites or areas are exceeded, and how often. Occupancy rates for day use and overnight facilities are important because carrying capacity standards and recreation infrastructure differ. Recreation Days are important for making regional comparisons between recreation areas and for estimating future recreation use on a regional level.

Table E5.2.2-4
Schedule of Manual Traffic Counts

Date	Site
2-June	Eastshore DUA
3-June	Lake Almanor Country Club #2 DUA/Boat Launch
14-June	Lake Almanor West DUA
16-June	Almanor Scenic Overlook
17-June	Hamilton Branch DUA/Boat Launch
21-June	Almanor Scenic Overlook
24-June	Lake Almanor West DUA
25-June	Eastshore DUA
29-June	Lake Almanor Country Club #2 DUA/Boat Launch
1-July	Almanor Scenic Overlook
3-July	Lake Almanor West DUA
8-July	Eastshore DUA
12-July	Hamilton Branch DUA/Boat Launch
13-July	Lake Almanor Country Club #2 DUA/Boat Launch
19-July	Eastshore DUA
23-July	Lake Almanor Country Club #2 DUA/Boat Launch
24-July	Almanor Scenic Overlook
28-July	Hamilton Branch DUA/Boat Launch
30-July	Lake Almanor West DUA
5-August	Almanor Scenic Overlook
6-August	Lake Almanor Country Club #2 DUA/Boat Launch
7-August	Lake Almanor West DUA
9-August	Eastshore DUA
10-August	Hamilton Branch DUA/Boat Launch
13-August	Almanor Scenic Overlook
16-August	Hamilton Branch DUA/Boat Launch
25-August	Lake Almanor West DUA
26-August	Eastshore DUA
7-September	Lake Almanor Country Club #2 DUA/Boat Launch
8-September	Eastshore DUA
10-September	Lake Almanor West DUA
11-September	Hamilton Branch DUA/Boat Launch
14-September	Lake Almanor West DUA
15-September	Almanor Scenic Overlook, Eastshore DUA
16-September	Hamilton Branch DUA/Boat Launch
17-September	Lake Almanor Country Club #2 DUA/Boat Launch
24-September	Almanor Scenic Overlook
29-September	Eastshore DUA
5-October	Lake Almanor West DUA
7-October	Eastshore DUA
12-October	Almanor Scenic Overlook

Source: EDAW, Inc

E5.2.2.3.7.1 Non-Holiday Weekend PAOT Use

This section estimates people, vehicles and boat trailers, as well as the utilization (percent occupancy) of parking spaces, picnic units, overnight rental units, and campsites during peak use periods of non-holiday weekends. Researchers documented their PAOT counts of the latter factors. Dispersed fishing and day use were estimated at dispersed sites along Belden and Seneca Reaches during peak use periods of non-holiday weekends (also considered a primary user group). The objective of this task was to determine if additional recreation facilities are needed in the Project area based on the utilization of existing facilities and on the use of informal recreational areas associated with the Project. Researchers traveled by vehicles to the selected sites on pre-selected, random stratified dates.

Due to the large size of the study area, use was documented at every site on every sample date using multiple field staff. Each selected site was sampled equally over the duration of the study. Upon arrival at each site, researchers recorded data on all of the variables identified above. Day use sites were sampled primarily during mid-afternoon periods, which are typically the times of maximum use/utilization. Some sites were sampled earlier or later in the day based upon site-specific use patterns. Estimated maximum use/utilization times for each site were determined based on conversations with site owner/operators and during preliminary site visits. Researchers observed vehicles entering each site on randomly selected dates to determine the average number of visitors in each vehicle.

During the spring and fall seasons, 5 additional weekend days of surveying were conducted at developed and dispersed sites. Surveying occurred on 2 weekend days from May 1 to Memorial Day, and 3 weekend days from Labor Day to October 6. Researchers traveled to these sites by vehicle and by foot. For dispersed sites, vehicle counts at trailheads and estimated vehicle occupancy rates were used to count and estimate the number of visitors in hard to access areas.

E5.2.2.3.7.2 Holiday Weekend PAOT Use

Holiday weekend use levels are important to document as they represent the maximum amount of use at a recreation area. Three peak season holiday dates were sampled, one each during the Memorial Day, Independence Day, and Labor Day Weekends. Three survey days for developed sites and 3 survey days for dispersed sites are assumed.

E5.2.2.3.7.3 DUA Occupancy Rates

The purpose of this task was to obtain occupancy rates for DUAs. Two occupancy rate measures were obtained:

- Picnic tables occupied; and
- Parking spaces occupied.

Information was collected via manual observations by field staff for each of the DUAs within the study area.

E5.2.2.3.7.4 Campground and Overnight Occupancy Rates

The purpose of this task was to obtain facility and occupancy information from campgrounds and resort owners in the study area regarding overnight occupancy rates. Campground occupancy data were collected by campground hosts for the Licensee using paid receipts. Based on the average daily number of occupied campsites, a percent occupancy for each campground was calculated. Campgrounds in this analysis include all those listed in the study area description (Section E5.2.2.2).

The percent of private resort occupancy was obtained through secondary methods from site and resort operators for pre-selected dates and timeframes. Resort operators reported the number of available rental units and occupancy rates (number of total visitors) for the entire season. Private resorts in this analysis include all those listed in the study area description (Section E5.2.2.2).

E5.2.2.3.7.5 Recreation Days

An estimate of day and overnight Project-related annual recreation visitation to recreation sites and major recreation resources, within the study area and the Project as a whole, was made. Recreation visitation was estimated in the number of RDs generated during the primary recreation season for each recreation area.

An RD is defined as a visit by a person to an area for recreation purposed during any portion of a 24-hour period.

E5.2.2.4 Results

As part of assessing existing use levels, this study identified the types, levels, and distribution of use at DUA and overnight study locations. Measures included PAOT, Vehicles-At-One-Time (VAOT), RDs, and campground occupancy. These commonly utilized measures are useful for managers as they consider present conditions while planning for future recreation needs at project sites. Use levels are fist discussed for DUAs, followed by campgrounds.

E5.2.2.4.1 PAOT, VAOT, Picnic Table and Parking Area Occupancy at DUAs

This section describes PAOT, VAOT, picnic table and parking area occupancy rates at DUAs by season. Seasonal variations are discussed. The section also details the total for each DUA and notes the maximum PAOT or VAOT reached at the site.

E5.2.2.4.2 Lake Almanor

Table E5.2.2-5 shows a breakdown of Lake Almanor day use site counts of mean PAOT.

The highest means for PAOT were seen at Lake Almanor West DUA, with a summer season mean of 26 people. This site also had the most persons counted throughout the sample with 363. The second highest maximum PAOT occurred at Lake Almanor Country Club 1 (86) with an average usage of 17 persons present. Average usage was slightly higher at Almanor Beach (19 persons) and much higher at Canyon Dam Boat Launch/DUA (24 persons). The second lowest PAOT was at the Super Channel shoreline area (1 person). Visitors were present at most of the sites. There were four sites where this was an exception: LART—South Trailhead, the vehicle pull-out 0.125

mile west of Canyon Dam, the site south of the Scenic Overlook, and the east entrance to Dyer View DUA. At the east entrance to Dyer View DUA, no visitors were observed during any of the sampling periods.

Table E5.2.2-5
Mean PAOT Counts for Lake Almanor Area Developed, Undeveloped, and Private DUAs

Sites	Early Season[1] Mean	Summer Mean		Late Season[4] Mean	All Seasons Total[5] PAOT	All Seasons Mean[6]	Max PAOT[7]
		Non-Holiday[2]	Holiday[3]				
Canyon Dam Boat Launch/DUA	12	32	29	14	348	24.9	55
Lake Almanor Recreation Trail (LART) South Trailhead	0	0	0	0	0	0	0
Dyer View DUA	1	11	12	6	122	8.7	23
Almanor Boat Launch	4	7	9	4	91	6.5	13
Almanor Beach	0	27	27	7	262	18.7	63
Almanor Rest Stop (SR 89)	1	4	0	3	37	2.6	8
Pull-out 0.125 mile west of Lake Almanor Dam	0	0	0	0	0	0	0
Site south of Scenic Overlook	0	0	0	0	0	0	0
East Entrance to Dyer DUA	0	0	0	0	0	0	0
Dyer View DUA/LART	0	0	1	1	6	0.4	3
Almanor Trail Crossing to 1st house	0	0	1	1	7	0.5	2
Super Channel Shoreline Area	0	0	0	0	1	07	1
Eastshore DUA	5	6	2	4	62	4.4	9
Almanor Scenic Overlook	0	0	0	0	7	0.5	5
Canyon Dam DUA	5	18	7	3	145	10.4	44
Hamilton Branch Access	2	5	4	5	61	4.4	12
Lake Almanor Country Club 1 DUA	2	13	43	10	242	17.3	86
Lake Almanor Country Club 2 DUA	0	22	18	7	226	16.1	55
Lake Almanor West DUA	1	40	25	15	363	25.9	175
Lake Almanor West Boat Launch	0	2	0	0	13	0.4	6

[1]Two sample days before Memorial Day.

[2]Six sample days from the day after Memorial Day up to Labor Day.

[3]Three sample days: Memorial Day, Independence Day, Labor Day.

[4]Three sample days from the day after Labor Day through end of sample season.

[5]All visitors counted at a given site.

[6]Average PAOT at a given site based on all activities throughout season.

[7]Maximum PAOT reached during all sample dates.

Source: EDAW, Inc.

In several cases the holiday weekends and non-holiday weekends during the peak season hosted higher use that during the early and late seasons combined. Examples of this typical recreation season use distribution were observed at Dyer View DUA, Almanor Boat Launch, Almanor Beach, Canyon Dam DUA, Lake Almanor Country Clubs 1 and 2, and Lake Almanor West DUA. At these sites, use was highest during peak season. At several sites (Canyon Dam Boat Launch/DUA, Canyon Dam DUA, and Lake Almanor West DUA) the mean PAOT was substantially higher on non-holiday sampling periods than during holiday sampling periods.

Also, to a lesser extent but evident nonetheless, SR 89 Rest Stop, Eastshore DUA, Hamilton Branch Access, and Lake Almanor West Boat Launch had proportionally greater use during the peak season than throughout the early and late seasons combined.

Table E5.2.2-6 shows mean VAOTs for Lake Almanor area sites, and vehicle and picnic table occupancy by site. Only categories (vehicles, vehicles with trailers, and picnic tables occupied) observed at sites are reported (e.g., if no one was seen at picnic tables or trailers without vehicles were not observed, they were not reported). Slightly more than 490 vehicles were observed during the nine sample dates at the seven developed sites identified around Lake Almanor. Between holiday and non-holiday counts, peak season observations were 493 vehicles. Holiday counts during the peak season had 325 observations, 66 percent of the peak season counts. Non-holiday Season counts had 168 observations, 34 percent of the peak season counts.

Table E5.2.2-6
Mean VAOT for Lake Almanor Developed DUAs and Parking Area and Picnic Table Occupancy

Sites and Vehicle or Development Counted	Summer Season[1]		Total[2]	Summer Season Mean[3]	Max At One Time[4]	Parking or Tables	Percent Occupancy[5]
	Non-Holiday	Holiday					
Canyon Dam Boat Launch/DUA							
Vehicles	9	38	165	18.3	37	13	140.8
Vehicles w/ trailers	12	30	160	17.8	32	51	34.9
Vehicle Subtotal	**121**	**204**	**325**				
Picnic tables	1	5	18	2	4	5	40
Canyon Dam DUA							
Vehicles	2	10	40	4.4	16	45	9.8
Picnic tables	0	2	9	1	4	19	5.3
Eastshore DUA							
Vehicles	0	2	9	1	2	10	10
Picnic tables	0	1	2	0.2	2	9	2.2
Dyer View DUA							
Vehicles	2	5	28	3.1	7	13	23.9
Almanor Beach							
Vehicles	3	13	56	6.2	15	42	14.8
Picnic tables	0	4	18	2	6	7	28.6
Almanor Rest Stop (SR 89)							
Vehicles	0	3	10	1.1	4	15	7.3
Picnic tables	0	0	1	0.1	1	7	1.4
Almanor Boat Launch							
Vehicles	1	6	25	2.8	12	58	4.8

[1]Six sample days from the day after Memorial Day up to Labor Day. Three sample days: Memorial Day, Independence Day, and Labor Day.

[2]All vehicle, trailers with vehicles, trailers without vehicles, and occupied picnic tables counted at a given site.

[3]Average VAOT at a given site based on all activities throughout peak season.

[4]Maximum VAOT or occupied picnic tables reached during all sample dates.

[5]Average occupancy rate.

Source: EDAW, Inc.

The highest mean VAOT was found for Canyon Dam Boat Launch/DUA. This site also had the most vehicles counted throughout the sample with 165. This site also had the highest number of vehicles with trailers-at-one-time (32), with 160 counted throughout the peak season.

On average, approximately 18 vehicles and vehicles with trailers were seen at Canyon Dam Boat Launch/DUA on study dates. For the holiday sampling period the mean PAOT was 38 for this site. The fewest VAOT were observed at the Eastshore DUA (2).

Parking area occupancy rates were calculated where applicable (site had designated parking and vehicles were observed). Canyon Dam Boat Launch/DUA has the highest occupancy rates with an average of over 100 percent of single vehicle spaces occupied. There are 13 spaces and the average VAOT was 18.3, resulting in an average of 140.8 percent occupancy. Canyon Dam Boat Launch/DUA had an occupancy rate for vehicles with trailers of 34.9 percent, with an average of 17.8 vehicles with trailers observed using the 51 spaces available. Almanor Boat Launch had an average of 2.8 vehicles observed on sample dates and 58 spaces available, resulting in a 4.8 percent occupancy rate.

Picnic table occupancy rates were calculated where applicable (site had picnic tables and use was observed). Canyon Dam Boat Launch/DUA had the highest occupancy rates with an average of 40 percent of picnic tables occupied. There are five picnic tables and the average number of tables occupied at one time was 2.0, thus 40 percent occupancy. The second highest occupancy rates occurred at Almanor Beach with an average occupancy rate for picnic tables of 28.6 percent. The Almanor Rest Stop (SR 89) area had the lowest occupancy rate with an average of 1.4 percent of picnic tables occupied on sample days.

Table E5.2.2-7 shows mean VAOTs for Lake Almanor area sites, vehicles with trailers, trailers without vehicles, and picnic tables being used. For these sites, occupancy rates were not calculated because they are private, undeveloped, or facility information was not gathered on site visits.

Table E5.2.2-7
Mean VAOT for Lake Almanor Developed, Undeveloped, Public or Private DUAs and Picnic Tables Occupancy

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]
	Non-Holiday	Holiday			
Public Sites					
LART—South Trailhead					
Vehicles	0	4	16	1.1	6
Trailers	0	0	1	0.1	1.0
Vehicle Subtotal	**4**	**13**	**17**		
Pull-out 0.125 mile West of Lake Almanor Dam					
Vehicles	0	0	1	0.1	1
Super Channel Shoreline Area					
Vehicles	0	1	4	0.4	2
Almanor Scenic Overlook					
Vehicles	0	2	5	0.6	5
Hamilton Branch Access					
Vehicles	0	2	6	0.7	2
Vehicles w/ trailers	0	1	6	0.7	2
Trailers	0	0	1	0.1	1
Vehicle Subtotal	**5**	**8**	**13**		
Vehicle Subtotal for Lake Almanor Area	**11**	**29**	**40**		
Private Sites					
Lake Almanor Country Club 1 DUA					
Vehicles	8	23	115	8.2	25
Vehicles w/ trailers	7	11	71	5.7	22
Trailers	1	1	7	0.8	4
Vehicle Subtotal	**15**	**34**	**193**		
Picnic tables	0	0	1	0.1	1
Lake Almanor Country Club 2 DUA					
Vehicles	2	30	101	7.2	23
Vehicles w/ trailers	6	15	80	5.7	19
Trailers	0	0	2	0.1	1
Vehicle Subtotal	**8**	**45**	**183**		
Picnic tables	0	1	4	0.3	2

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]
	Non-Holiday	Holiday			
Lake Almanor West DUA					
Vehicles	5	25	107	7.6	45
Vehicles w/ trailers	1	0	5	0.4	2
Trailers	0	0	1	0.1	1
Vehicle Subtotal	**6**	**25**	**113**		
Picnic tables	1	5	19	1.4	10
Lake Almanor West Boat Launch					
Vehicles	0	1	6	0.4	2
Vehicles w/ trailers	2	2	21	1.5	8
Trailers	0	1	2	0.1	1
Vehicle Subtotal	**2**	**4**	**29**		
Vehicle Totals by Season	**200**	**358**	**558**		
Total All Sites/All Vehicles			**1,116**		

[1] *Six sample days from the day after Memorial Day up to Labor Day. Three sample days: Memorial Day, Independence Day, and Labor Day.*

[2] *All visitors counted at a given site.*

[3] *Average VAOT at a given site based on all activities throughout peak season.*

[4] *Maximum VAOT reached during all sample dates.*

Source: EDAW, Inc.

Only categories (vehicles, vehicles with trailers, trailers without vehicles, and picnic tables occupied) observed at sites are reported (e.g. if no one was seen at picnic tables or trailers without vehicles were not observed, they were not reported).

Lake Almanor West DUA had the most VAOT of the private sites at Lake Almanor (45). Seventy-five of the 107 vehicles observed at this site were counted on non-holiday weekends during the peak season. The LART—South Trailhead had the second most VAOT of the public sites at Lake Almanor (6). Twelve of the 16 vehicles observed at this site were counted on non-holiday weekends during the peak season. The

LART—South Trailhead had 17 vehicles of various types observed during all sample days.

Lake Almanor Country Club 1 had the most observations for all types of vehicles (193), and Lake Almanor Country Club 2 had the second most observations for all types of vehicles with 183. Lake Almanor Country Club 1 had the second most overall VAOT with 25, compared to 45 at Lake Almanor West DUA. In general, Lake Almanor Country Club 1 holiday use was not substantially greater than non-holiday use during the peak season.

Lake Almanor West DUA had the highest amount of picnic tables occupied at one time (10), and use was almost tripled during holiday compared to non-holidays times during the summer season. Lake Almanor Country Club 1 had the fewest picnic tables occupied (1) during the one-time observations of the sites where picnic tables existed were conducted. Lake Almanor Country Club 2 had two observations of picnic tables occupied at one time and all of the site's use occurred on non-holiday weekends during the peak season.

E5.2.2.4.3 Butt Valley Reservoir

Table E5.2.2-8 shows a breakdown of sites around Butt Valley Reservoir and counts for PAOT. 184 people were observed during the 13 sample dates at the six sites identified around Butt Valley Reservoir. Between holiday and non-holiday counts, peak season

observations were 137 persons, 74.5 percent of all counts for the season. The majority of people counted during the peak season were observed on holiday weekends.

Table E5.2.2-8
Mean PAOT for Butt Valley Reservoir Developed and Undeveloped DUAs

Sites	Early Season[1] Mean	Summer Mean		Late Season[4] Mean	All Seasons Total[5] PAOT	All Seasons Mean[6]	Max PAOT[7]
		Non-Holiday[2]	Holiday[3]				
Butt Creek Access Road	0	2	3	2	25	2	8
Butt Valley Powerhouse to Ponderosa Flat Campground	6	4	4	2	41	3	12
Ponderosa Flat Campground to Alder Creek DUA/Boat Launch	0	2	3	0	14	1	9
Alder Creek DUA/Boat Launch	6	1	8	3	50	4	21
Alder Creek DUA/Boat Launch to Cool Springs Campground	0	1	3	2	23	2	6
Cool Springs Campground to Butt Valley Dam	0	2	8	0	31	2	12

[1]One sample day before Memorial Day.

[2]Four sample days from July 6th through August 17th when the late season began.

[3]Three sample days for two holidays: Memorial Day, Independence Day (3rd and 5th).

[4]Five sample days after Labor Day and continuing through end of sample season.

[5]All visitors counted at a given site.

[6]Average PAOT at a given site based on all activities throughout season.

[7]Maximum PAOT reached during all sample dates.

Source: EDAW, Inc.

Although there were more non-holiday sample dates, holiday use observations resulted in higher counts (88 people vs. 49). The early season had 12 observations, 8.8 percent of the peak season counts and 6.5 percent of all counts. The late season had 39 observations, 28.5 percent of the peak season counts and 21.2 percent of all counts.

The highest numbers of PAOT were seen at Alder Creek DUA/Boat Launch, with a maximum count of 21 people and a mean of four people. This number is nearly twice as

high as the second highest max PAOT. The second highest number of PAOT occurred at a dispersed site alongside Butt Valley Road between Butt Valley Powerhouse and Ponderosa Flat Campground (41) with an average 3 people present.

The dispersed site between Ponderosa Flat Campground and Alder Creek DUA/Boat Launch had an average of 1 person present on sample dates (the lowest). Visitors were not always present at all sites on sample dates, but all sites had observed use on at least one or more of the sample dates.

In several cases the holiday weekends and non-holiday weekends during the peak season hosted higher use that during the early and late seasons combined. Examples of this typical recreation season use distribution were observed at dispersed sites: between Butt Valley Powerhouse and Ponderosa Flat Campground, between Ponderosa Flat Campground and Alder Creek DUA/Boat Launch, and between Cool Springs Campground and Butt Valley Dam. At these sites, use was highest during peak season. Also, to a lesser extent but evident nonetheless, along Butt Creek Access Road, between Alder Creek and Cool Springs Campground, and Alder Creek DUA/Boat Launch had proportionally greater use during the peak season than throughout the early and late seasons combined.

Table E5.2.2-9 shows a breakdown of VAOT for Butt Valley Reservoir sites, vehicles with trailers-at-one-time, and vehicle and picnic table occupancy. Alder Creek DUA/Boat Launch is the only developed site within this area. Only vehicles, vehicles

with trailers, and picnic tables occupied observed at sites were reported (e.g. if no one was seen at picnic tables or trailers without vehicles were not observed, they were not reported). A total of 11 vehicles (vehicles and vehicles with trailers) were observed during the seven sample dates at the site. Holiday counts during the peak season had three observations, 27.3 percent of the peak season counts.

Table E5.2.2-9
Mean VAOT for Butt Valley Reservoir Developed DUAs
Parking Area and Picnic Table Occupancy

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]	Parking or Tables	Percent Occupancy[5]
	Holiday	Non-Holiday					
Alder Creek DUA/Boat Launch							
Vehicles	1	1	5	0.7	1	10	7
Vehicles w/ trailers	0	1	6	0.9	3	10	9
Vehicle Subtotal	1	2	11		4		
Picnic tables	0	0	3	0.4	1	3	13.3

[1]Three sample days for two holidays: Memorial Day and Independence Day (3rd and 5th). Four sample days after Memorial Day.

[2]All vehicles counted at a given site.

[3]Average VAOT at a given site based on all activities throughout peak season.

[4]Maximum VAOT reached during all sample dates.

[5]Average occupancy rate

Source: EDAW, Inc.

Non-holiday season counts had eight observations, 72.7 percent of the peak season counts.

The highest number of VAOT was 3. On average 1.6 vehicles were seen at Alder Creek DUA/Boat Launch on study dates reported (peak season).

An average of 7 percent of single vehicle spaces were occupied. There are 10 spaces and the average number of vehicles observed at one time was 0.7, thus an average of 7

percent occupancy was observed. An average of 9 percent of vehicles with trailers spaces were occupied. There are 10 spaces and the average number of vehicles with trailers observed was 0.9, thus an average of 9 percent occupancy was observed.

An average of less than 1 percent of picnic tables were occupied. There are three spaces and the average number of vehicles observed at one time was 0.4, thus yielding a 13.3 percent occupancy.

Table E5.2.2-10 shows a breakdown of VAOT for Butt Valley Reservoir sites, and vehicles with trailers-at-one-time, and trailers without VAOT. For these sites, parking area and picnic table occupancy rates were not calculated because they are undeveloped and those facilities do not exist. Only categories (vehicles, vehicles with trailers, or trailers without vehicles) observed at sites are reported (e.g. if trailers without vehicles were not observed, they were not reported).

The area between Butt Valley Powerhouse to Ponderosa Flat Campground had the highest mean VAOT of the sites around Butt Valley Reservoir (3.5). Along with vehicles, vehicles with trailers (2) were also observed at this site on Memorial Day Weekend (maximum vehicles with trailers-at-one-time). Three of the five sites around Butt Valley Reservoir had 20 or more combined types of vehicles observed throughout sample dates. Two of the five sites had less than 20 or more combined types of vehicles observed throughout sample dates.

Table E5.2.2-10
Mean VAOT for Butt Valley Reservoir Undeveloped DUAs

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]
	Non-Holiday	Holiday			
Butt Creek Main Access Road					
Vehicles	3	3	19	2.7	7
Vehicles w/ trailers	0	0	1	0.1	1
Vehicle Subtotal	**3**	**3**	**20**		
Butt Valley Powerhouse to Ponderosa Flat Campground					
Vehicles	3	4	24	3.5	9
Vehicles w/ trailers	1	0	4	0.6	3
Trailers	0	0	1	0.1	1
Vehicle Subtotal	**4**	**4**	**29**		
Ponderosa Flat Campground to Alder Creek DUA/Boat Launch					
Vehicles	4	0	14	2	14
Vehicles with trailers	3	0	12	2	2
Vehicle Subtotal	**2**	**1**	**26**		
Alder Creek/DUA Boat Launch to Cool Springs Campground					
Vehicles	1	1	6	0.9	4
Vehicles w/ trailers	1	0	3	0.5	3
Vehicle Subtotal	**2**	**1**	**9**		
Cool Springs Campground to Butt Valley Dam					
Vehicles	2	1	11	1.6	4
Vehicles w/ trailers	2	0	6	0.9	6
Vehicle Subtotal	**4**	**1**	**17**		

[1]Three sample days for two holidays: Memorial Day and Independence Day (3rd and 5th). Four sample days after Memorial Day.

[2]All vehicle types counted at a given site.

[3]Average VAOT at a given site based on all activities throughout season.

[4]Maximum VAOT reached during all sample dates.

Source: EDAW, Inc.

E5.2.2.4.4 Belden Reach

Table E5.2.2-11 shows a breakdown of Belden Reach area sites and mean PAOT measures. A total of 243 people were observed during the 12 sample dates at the seven sites identified around Belden Reach. Summer season observations were 191 persons, 79 percent of counts for the three seasons.

Mean PAOT levels were highest during holiday weekends, with the exception of Siphon to North Fork campground.

Table E5.2.2-11
Mean PAOT for Belden Reach Area Developed and Undeveloped DUAs

Sites	Early Season[1] Mean	Summer Mean		Late Season[4] Mean	All Seasons Total[5] PAOT	All Seasons Mean[6]	Max PAOT[7]
		Non-Holiday[2]	Holiday[3]				
Belden Rest Stop (SR 70)	11	5	8	0	49	4.1	17
Caribou Corners RV Park to Gansner Bar Campground	0	5	10	0	45	3.8	15
Gansner Bar Campground to Siphon	0	6	7	0	40	1.7	12
Siphon to North Fork Campground	0	4	3	2	28	2.3	8
North Fork Campground to Queen Lily Campground	3	0	5	0	12	1	9
Queen Lily to Belden Forebay Dam	5	7	8	2	54	4.5	15
Caribou Powerhouse Gate/NFFT Start	4	0	3	0	15	1.3	6

[1]Two sample days before Memorial Day.

[2]Four sample days from July 15th to August 24th.

[3]Two sample days: Memorial Day and Labor Day.

[4]Four sample days from the day after Labor Day through end of sample season.

[5]All visitors counted at a given site.

[6]Average PAOT at a given site based on all activities throughout season.

[7]Maximum PAOT reached during all sample dates.

Source: EDAW, Inc.

Although there were more non-holiday sample dates, holiday use observations resulted, but there were twice as many sample days as for holidays (4 non-holiday vs. 2 holiday). Thus on a per sample day basis, holidays had more observations (41) on average than non-holiday weekends (27) during the peak season. The early season had 23 observations, 12 percent of the peak season counts and 10 percent of all counts. The late season had 29 observations, 15 percent of the peak season counts and 12 percent of all counts.

The highest mean PAOT was found at the dispersed area from Queen Lily to Belden Forebay. This site had the greatest number of people counted throughout sample dates, with 54. On average, about 5 people were observed at the dispersed site: between Queen Lily Campground and Belden Forebay. The Holiday mean PAOT was highest at the dispersed areas from Caribou Corners RV Park to Gansner Bar Campground (10), followed by Queen Lily to Belden Forebay (18). The dispersed site between Ponderosa Flat Campground and Alder Creek DUA/Boat Launch had an average of 1 person present on sample dates (the lowest). On average, 20.3 people were seen at sites around Belden Reach on study dates, regardless of season. Visitors were not always present at all sites on sample dates, but all sites had observed use on at least one or more of the sample dates.

In several cases the holiday weekends and non-holiday weekends during the peak season hosted higher use that during the early and late seasons combined.

Examples of this typical recreation season use distribution were observed at dispersed sites: between the Caribou Corners RV Park and Gansner Bar Campground, between Gansner Bar Campground and the Siphon, between North Fork Campground and Queen Lily Campground, and at the Belden Rest Stop (SR 70). At these sites, use was highest during peak season.

Table E5.2.2-12 shows a breakdown of VAOT for Belden Reach area sites and vehicle occupancy rates. Belden Rest Stop (SR 70) is the only developed site in the area where occupancy can be assessed based on developed parking spaces.

Only one type of vehicle (without trailers) was observed at this site.

Between holiday and non-holiday counts, peak season observations were 42 vehicles. Holiday counts during the peak season had seven observations, 16.7 percent of the peak season counts. Non-holiday season counts had 35 observations, 83.3 percent of the peak season counts. The highest number of VAOT was 25. On average seven vehicles were seen at Belden Powerhouse Rest Stop on study dates reported (peak season).

Table E5.2.2-12
Mean VAOT for Belden Reach Developed DUA and Parking Area Occupancy

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]	Parking Spaces	Percent Occupancy[5]
	Holiday	Non-Holiday					
Belden Rest Stop (SR 70)							
Vehicles	4	8	42	7	25	15	47

[1]Memorial Day and Labor Day. Four sample days from July 15th to August 24th.

[2]All visitors counted at a given site.

[3]Average VAOT at a given site based on all activities throughout peak season.

[4]Maximum VAOT reached during all sample dates.

[5]Average occupancy.

Source: EDAW, Inc.

Table E5.2.2-13 shows a breakdown of VAOT for Belden Reach area sites, vehicles with trailers-at-one-time, and picnic tables occupied. For these sites, parking area and picnic table occupancy rates were not calculated because they are undeveloped and those facilities do not exist, or information about facilities was not gathered during field visits. Only categories (vehicles and vehicles with trailers) observed at sites are reported.

Table E5.2.2-13
Belden Reach Undeveloped DUAs VAOT and Picnic Tables Occupancy

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]
	Non-Holiday	Holiday			
Caribou Corners RV Park to Gansner Bar Campground					
Vehicles	1	2	9	1	4
Vehicles w/ trailers	2	0	8	1.1	8
Vehicle Subtotal	**3**	**2**	**17**		
Gansner Bar Campground to Siphon					
Vehicles	4	7	28	4.7	13
Vehicles w/ trailers	2	0	8	1.1	7
Vehicle Subtotal	**6**	**7**	**36**		
Picnic tables	0	2	3	0.5	3
Siphon to North Fork Campground					
Vehicles	2	4	13	2.2	6
Vehicles w/ trailers	0	0	3	0.4	2
Vehicle Subtotal	**2**	**4**	**16**		
North Fork Campground to Queen Lily Campground					
Vehicles	1	0	5	0.8	4
Vehicles w/ trailers	2	0	6	0.9	6
Vehicle Subtotal	**3**	**0**	**11**		
Queen Lily Campground to Belden Forebay Dam					
Vehicles	3	9	28	4.7	9
Vehicles w/ trailers	0	0	1	0.1	1
Vehicle Subtotal	**3**	**9**	**29**		
Caribou Powerhouse Gate/NFFT Start					
Vehicles	3	2	5	0.8	3

[1]Memorial Day and Labor Day. Four sample days from July 15th to August 24th.

[2]All visitors counted at a given site.

[3]Average VAOT at a given site for item counted.

[4]Maximum VAOT reached during all sample dates.

Source: EDAW, Inc.

The area between Gansner Bar Campground and the Siphon had the most VAOT of the sites around Belden Reach (13). Half the vehicles (14) observed at this site were counted on holidays and the other half during the remainder of the peak season. The site also had the most vehicles (with and without trailers) observed during the sample season (36).

The site with the second most total VAOT for the sample season was the area between Queen Lily Campground and Belden Forebay Dam (29). The average amount of observations per sample day for all types of vehicles across all sites around Belden Reach was 19. Two of the five sites around Butt Valley Reservoir had 20 or more combined types of vehicles observed throughout sample dates. Three of the five sites had less than 20 or more combined types of vehicles observed throughout sample dates. A total of 114 vehicles of all types were observed throughout the sample season.

E5.2.2.4.5 Seneca Reach

Table E5.2.2-14 shows a breakdown of Seneca Reach area sites and PAOT counts. Seven people were observed during the 13 sample dates at the single site identified around Seneca Reach. Between holiday and non-holiday counts, peak season observations were 7 persons, 100 percent of all counts for the season. The majority of people counted during the peak season were observed on non-holiday weekends. The proportion of observations was similar for holiday and non-holiday sample dates. Both the early season and late season had no observations. On average, one person was observed on just over half the sample dates.

Table E5.2.2-15 shows a breakdown of PAOT by Project resource areas. Throughout the sample season 1,993 persons were observed at Lake Almanor sites, 184 persons were observed at Butt Valley Reservoir sites, 243 persons were observed at Belden Reach sites, and seven persons were observed at the Seneca Bridge. Combined, the Project had 2,427 persons observed for all sample days.

Table E5.2.2-14
Mean PAOT for Seneca Reach Undeveloped

Sites	Early Season[1] Mean	Summer Mean		Late Season[4] Mean	All Seasons Total[5] PAOT	All Seasons Mean[6]	Max PAOT[7]
		Non-Holiday[2]	Holiday[3]				
Seneca Bridge Area (Total)	0	1	0	1	7	0.5	4

[1]One sample day before Memorial Day.

[2]Four sample days from July 10th to August 17th.

[3]Three sample days for two holidays: Memorial Day, Independence Day (3rd and 5th).

[4]Five sample days from September 8th through end of sample season.

[5]All visitors counted at given site.

[6]Average PAOT at given site based on all activities throughout season.

[7]Maximum PAOT reached during all sample dates.

Source: EDAW, Inc.

Table E5.2.2-15
Summary of Total People Observed within Project Area

Resource Area	People	Percent of Project Total
Lake Almanor	1,993	82.1
Butt Valley Reservoir	184	7.6
Belden Reach	243	10.0
Seneca Reach	7.0	0.3
Project Total	2,427	100

Source: EDAW, Inc.

Table E5.2.2-16 shows a breakdown of VAOT for Seneca Reach area sites. Seneca Bridge in the Town of Seneca was the site that was assessed.

Only one type of vehicle (without trailers) was observed at this site. Between holiday and non-holiday counts, peak season observations were seven vehicles. Holiday counts during the peak season had five observations, 71.4 percent of the peak season counts. Non-holiday season counts had two observations, 28.6 percent of the peak season counts.

Table E5.2.2-16
Mean VAOT for Seneca Reach Undeveloped DUA

Sites and Vehicle or Development Counted	Summer Season[1]		Summer Season Total[2]	Summer Season Mean[3]	Max At One Time[4]
	Non-Holiday	Holiday			
Seneca Reach Area					
Vehicles	0	1	7	1	2

[1]Four sample days from July 10th to August 17th. Three sample days for two holidays: Memorial Day, Independence Day (3rd and 5th).

[2]All visitors counted at given site.

[3]Average VAOT at given site based on all activities throughout peak season.

[4]Maximum VAOT reached during all sample dates.

Source: EDAW, Inc.

The highest numbers of VAOT was 2. On average one vehicles was seen at Seneca Town Bridge on study dates reported (peak season). Table E5.2.2-17 shows a breakdown of VAOT counts for the four Project area resource areas. Throughout the sample season 1,051 vehicles were observed at Lake Almanor sites, 114 vehicles were observed at Butt Valley Reservoir sites, 156 vehicles were observed at Belden Reach sites, and seven vehicles were observed at Seneca Bridge (the Seneca Reach site). Combined, the Project had 1,328 vehicles observed for all sample days.

Table E5.2.2-17
Total Vehicles Observed within Project Area During Peak Season

Resource Area	All Types of Vehicles	Percent of Project Total
Lake Almanor	1,051	79.1
Butt Valley Reservoir	114	8.6
Belden Reach	156	11.8
Seneca Reach	7	0.5
Project Total	**1,328**	**100**

Source: EDAW, Inc.

E5.2.2.4.6 Campground Facilities Occupancy and Visitation

The following section describes campground use levels and occupancy levels for developed Licensee and Forest Service Campgrounds throughout the Project area, including a section on historic campground occupancy data from the Licensee's Lake Almanor Campground and the Forest Service's Almanor Campground. For all the following Campground tables, early season begins when campgrounds open and ends the day before Memorial Day. Peak season begins Memorial Day and ends with the Labor Day Weekend. Late season begins after Labor Day Weekend and ends when campgrounds close for the season. There are no developed campgrounds in the Seneca Reach area, thus no information for the area is reported in this section.

E5.2.2.4.6.1 16-Year Trends in Licensee Campground Occupancy at Lake Almanor

Figures E5.2.2-2 through E5.2.2-4 depict 16-year trends in occupancy for Licensee campground occupancy at Lake Almanor, Last Chance, and Ponderosa Flat Campgrounds. Figure E5.2.2-5 depicts 3-year trends in occupancy for the Forest Service-managed Almanor Campground (Forest Service did not provide pre-1999 data, nor data for campgrounds on the Belden Reach). Figures E5.2.2-6 through E5.2.2-13 depict trends in monthly campground occupancy for 2001 for all Licensee campgrounds.

Regarding 16-year data, occupancy at Lake Almanor campgrounds has remained relatively constant (see Figure E5.2.2-2), has decreased at Last Chance Campground/Group Camp (see Figure E5.2.2-3), and decreased by more than 10 percent at Ponderosa Flat Campground (see Figure E5.2.2-4). During August 2001, there were

several days in July and August when weekday occupancy levels exceeded 100 percent at Last Chance Campground/Group Camp (see Figure E5.2.2-8). Similarly, weekday

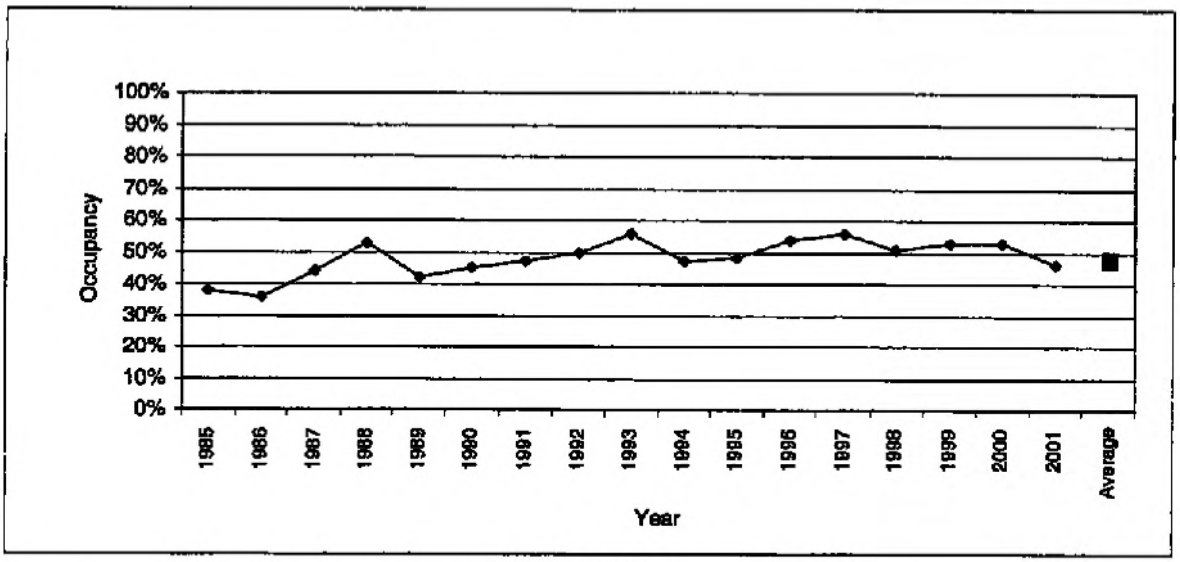


Figure E5.2.2-2
Lake Almanor Campground Occupancy (1985–2001)

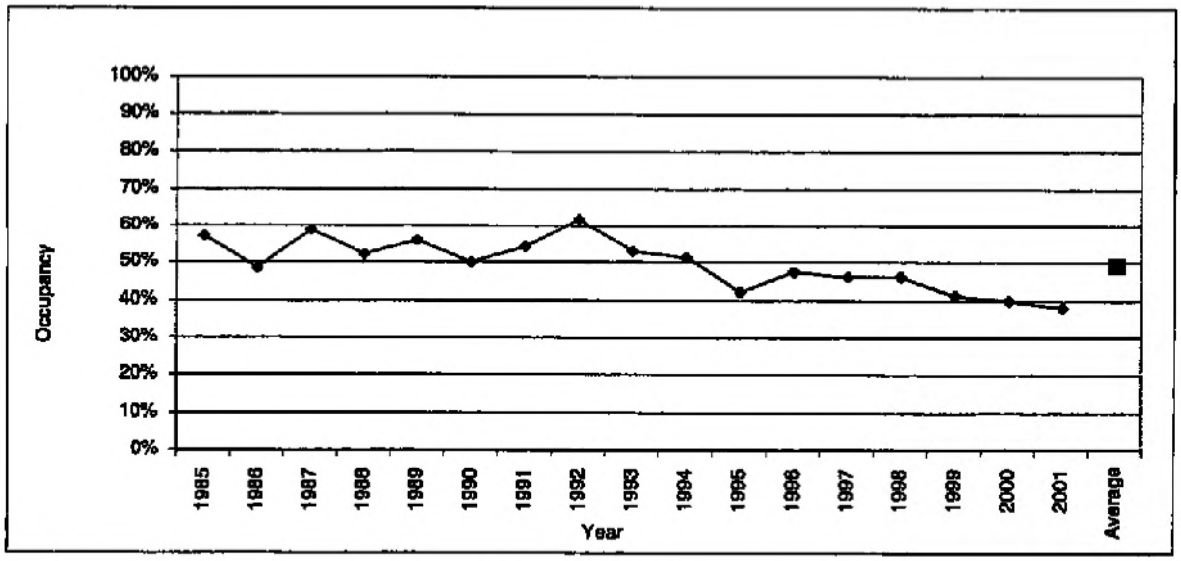


Figure E5.2.2-3
Last Chance Campground/Group Camp Occupancy (1985–2001)

occupancy levels reached 100 percent at Ponderosa Flat Campground (see Figure E5.2.2-10) for 2 days in August. A similar trend was observed at Queen Lily Campground (see Figure E5.2.2-11) and Gansner Bar (see Figure E5.2.2-13).

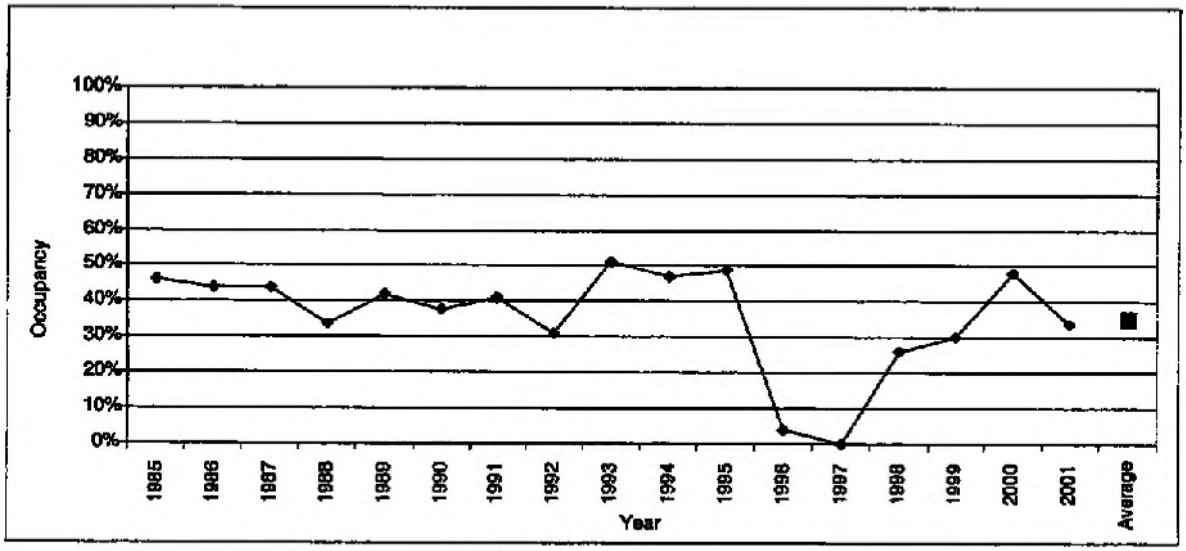


Figure E5.2.2-4
Ponderosa Flat Campground Occupancy (1985–2001)

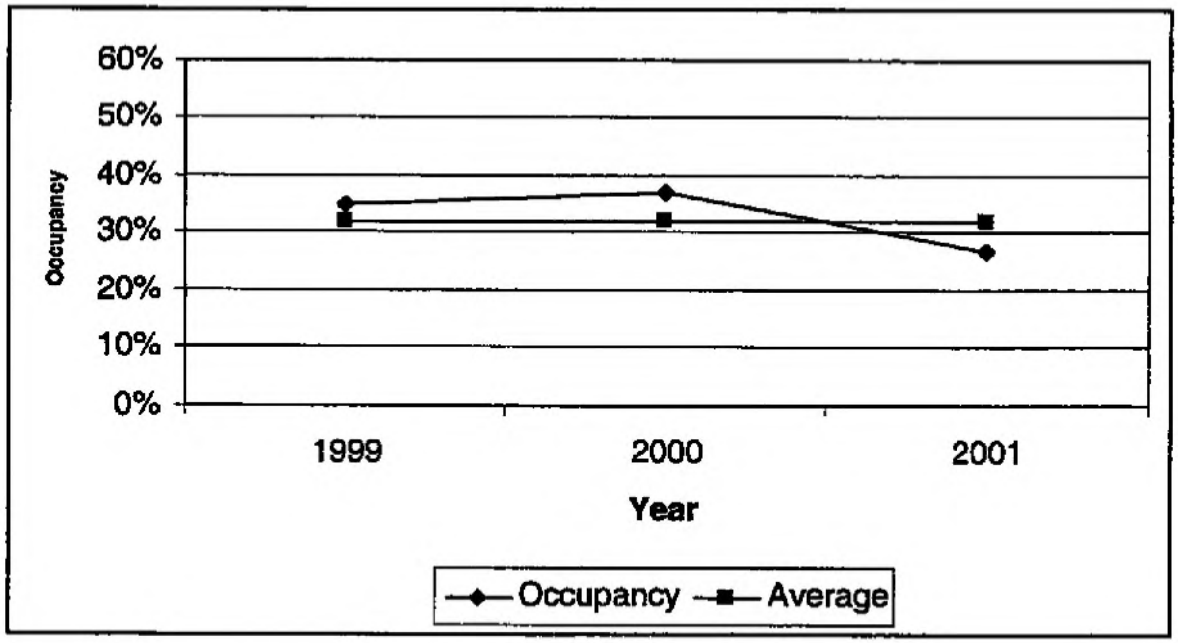


Figure E5.2.2-5
3-Year Trends in Forest Service Campground Occupancy at Lake Almanor

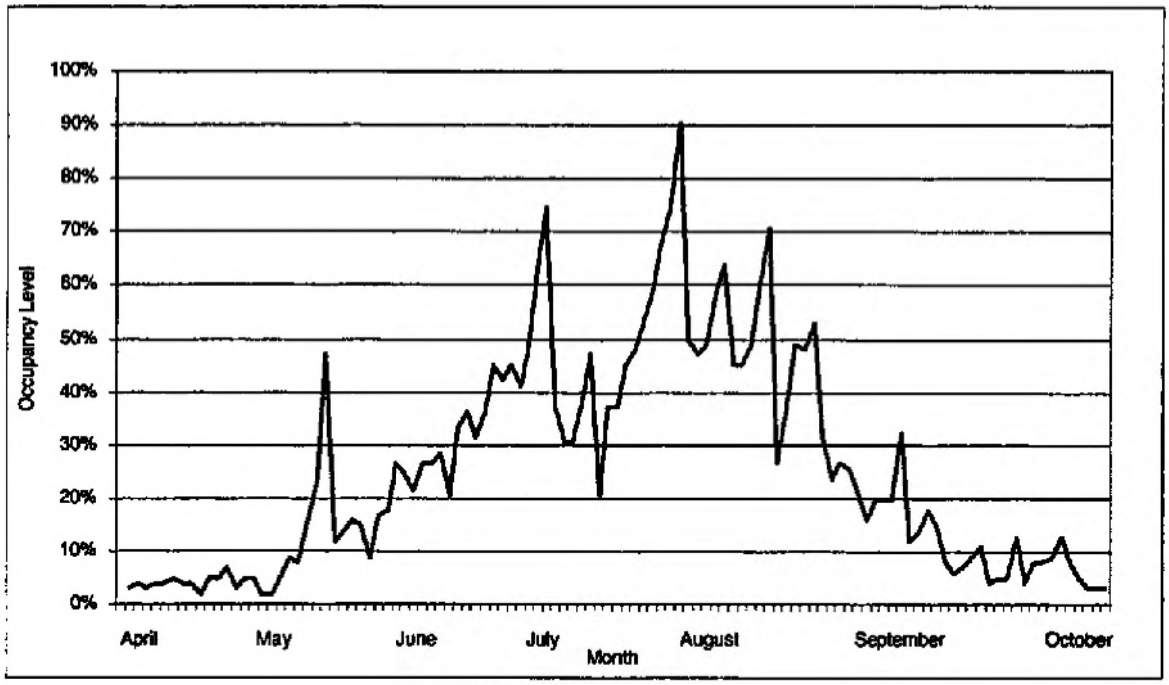


Figure E5.2.2-6
Almanor Campground 2001 Weekday Occupancy

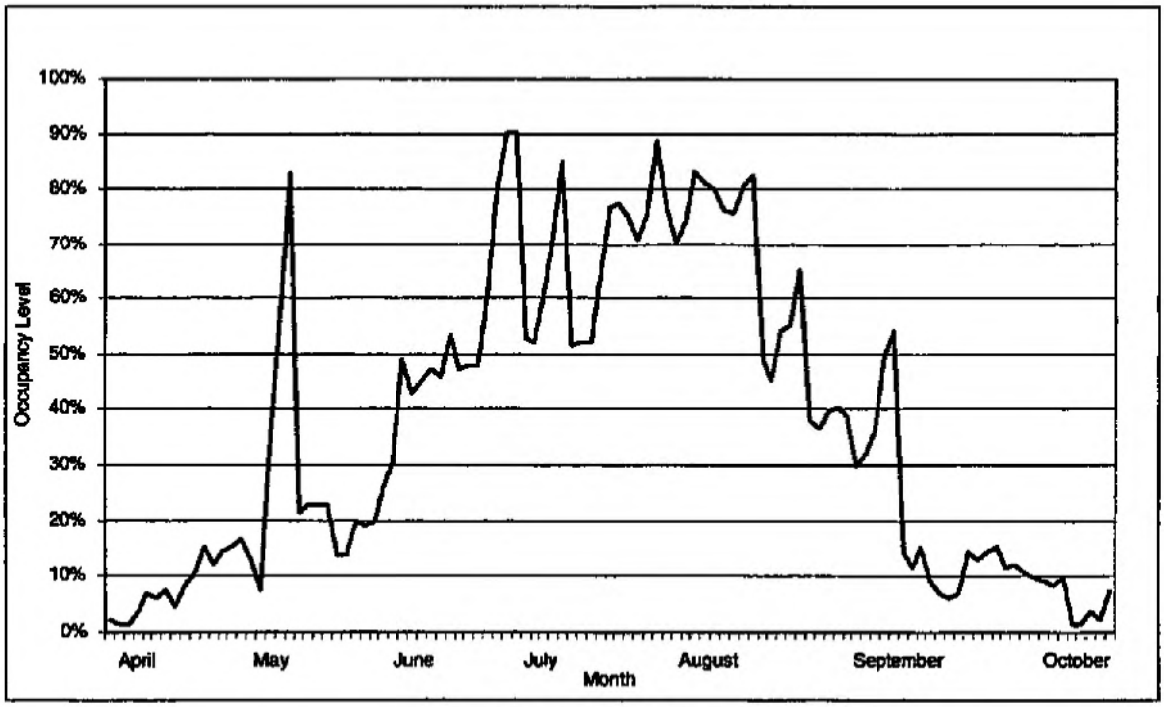


Figure E5.2.2-7
Lake Almanor Campground 2001 Weekday Occupancy

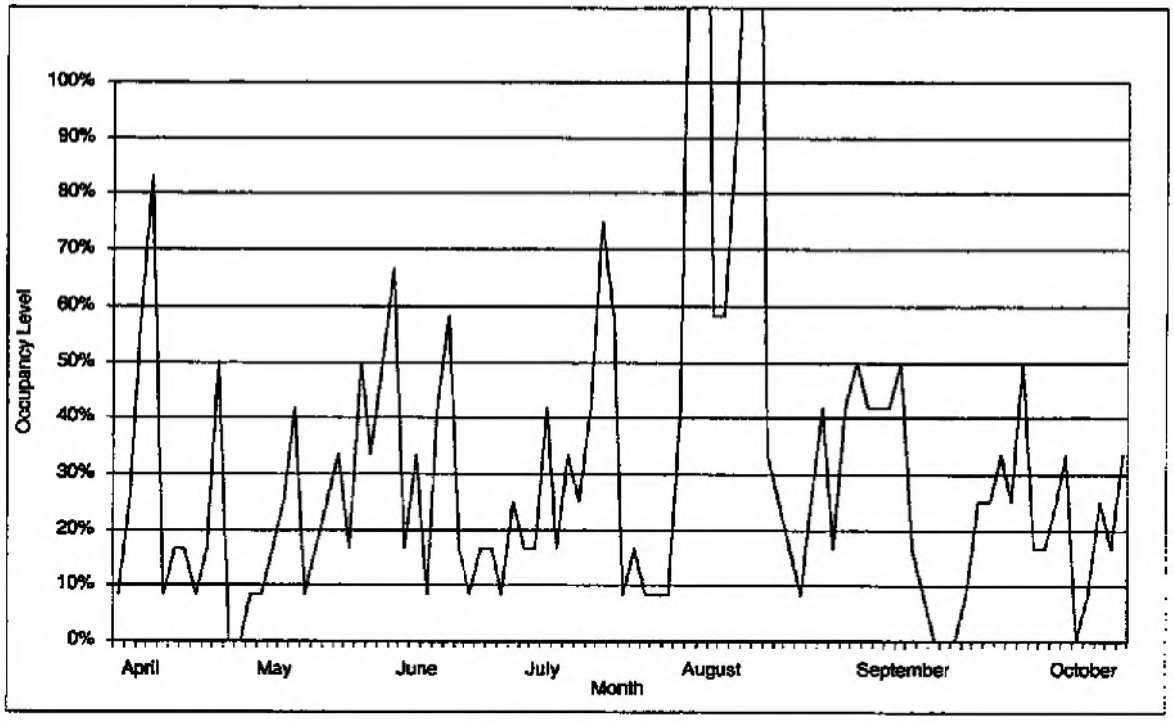


Figure E5.2.2-8
Last Chance Campground/Group Camp 2001 Weekday Occupancy

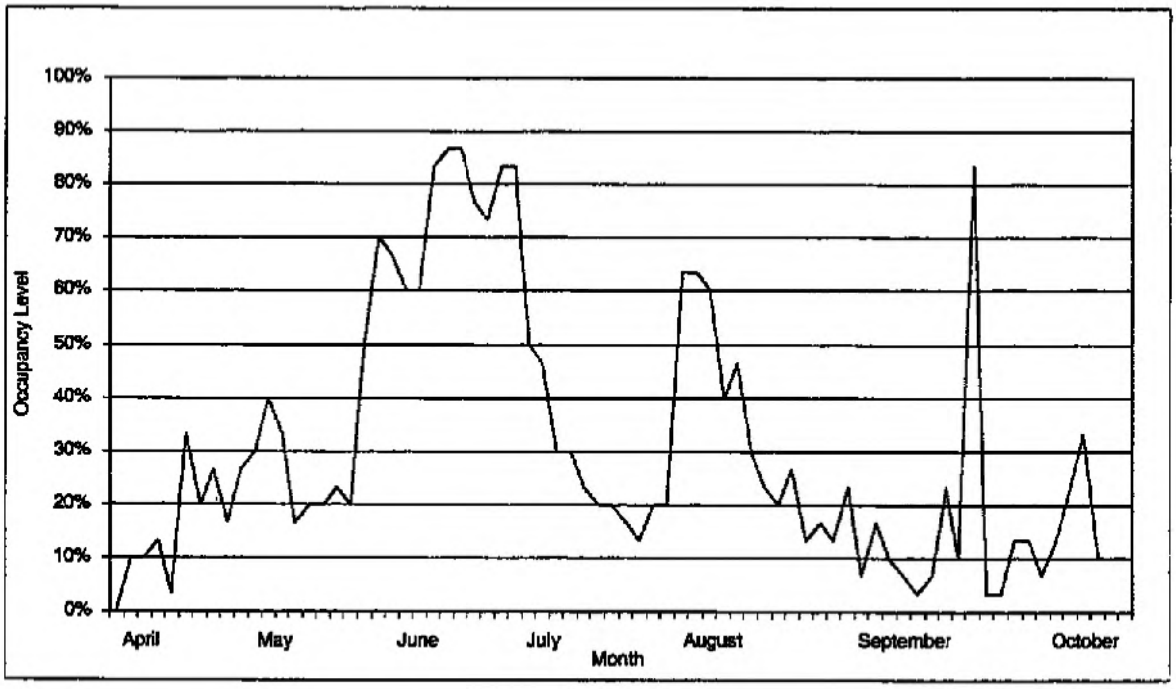


Figure E5.2.2-9
Cool Springs Campground 2001 Weekday Occupancy

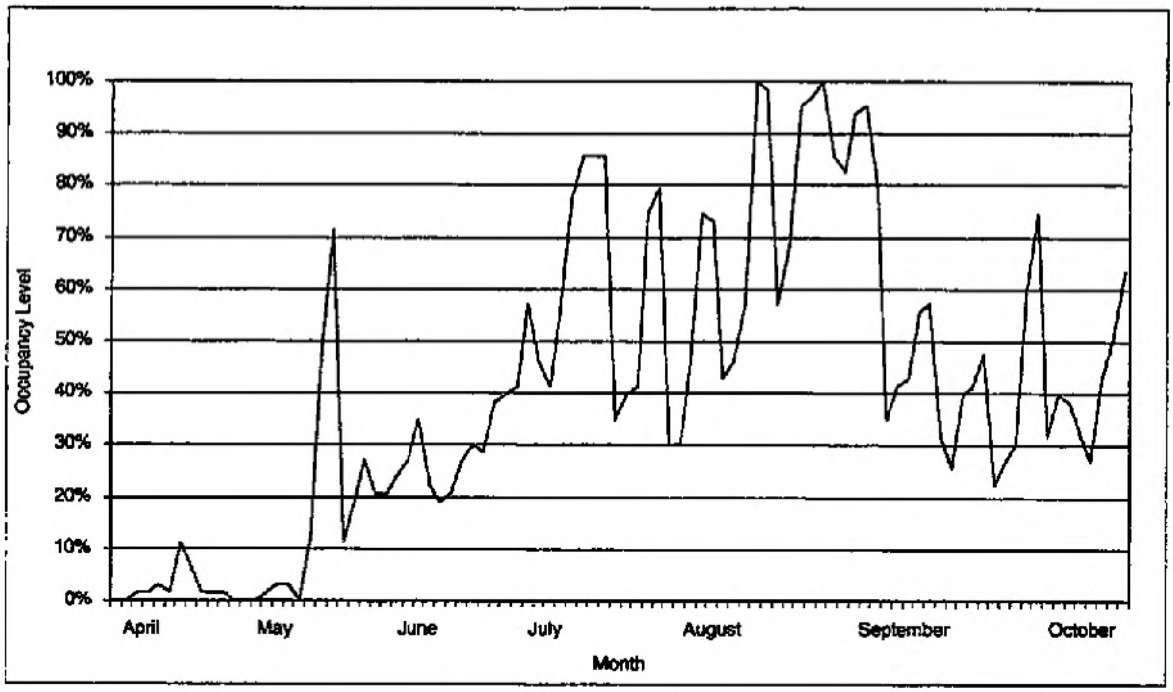


Figure E5.2.2-10
Ponderosa Flat Campground 2001 Weekday Occupancy

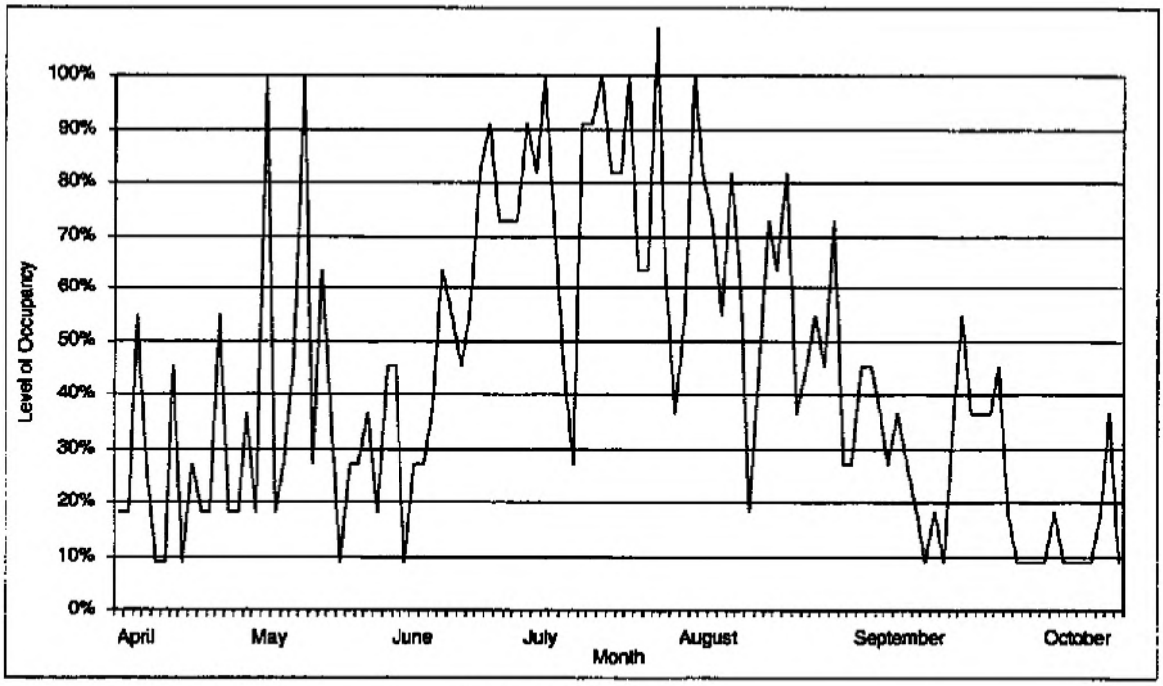


Figure E5.2.2-11
Queen Lily Campground 2001 Weekday Occupancy

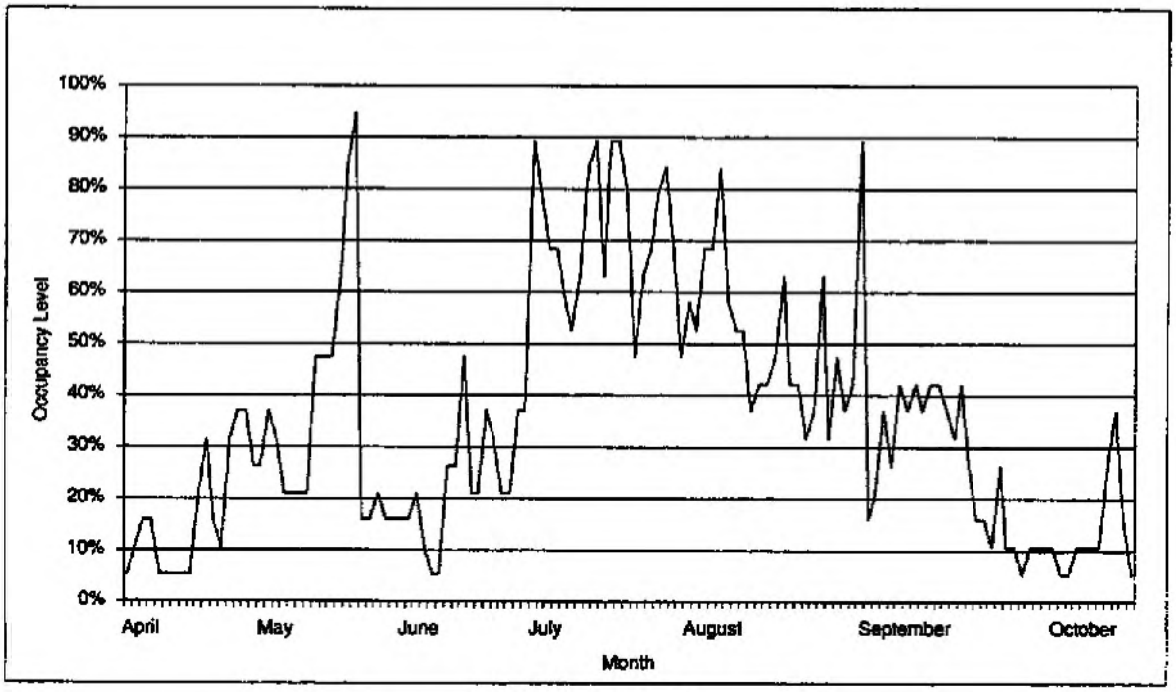


Figure E5.2.2-12
North Fork Campground 2001 Weekday Occupancy

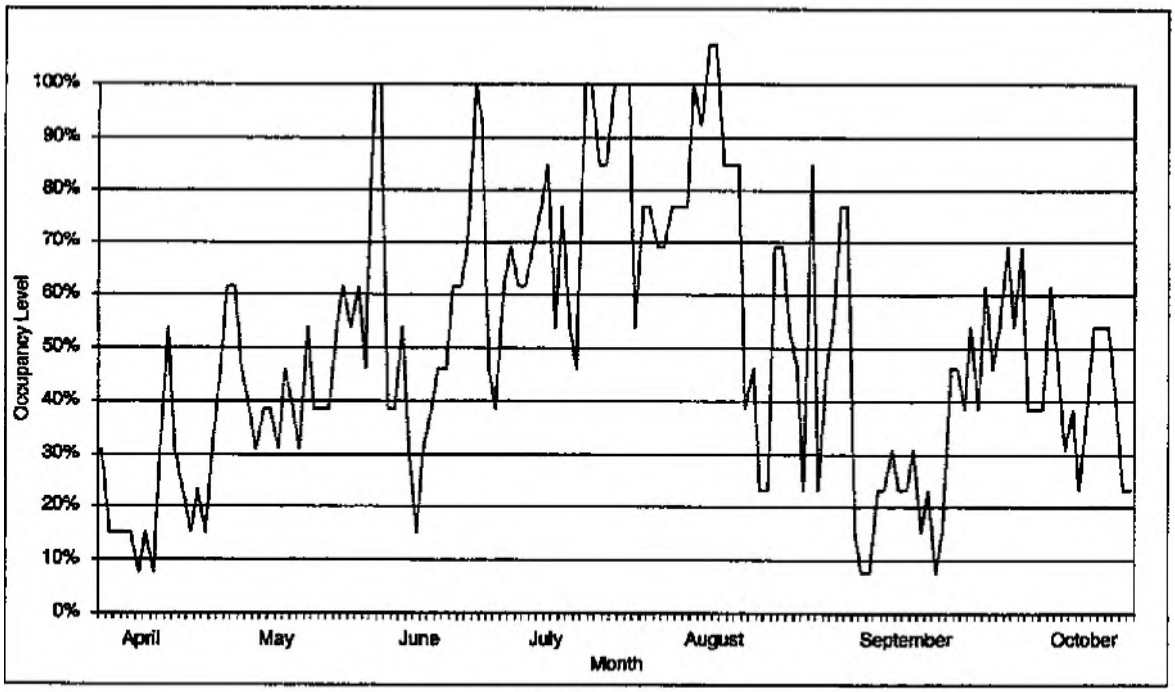


Figure E5.2.2-13
Gansner Bar Campground 2001 Weekday Occupancy

E5.2.2.4.6.2 Weekday Occupancy at Project Area Campgrounds

Table E5.2.2-18 shows a breakdown of weekday visits by season for each Project area resource area. For the Lake Almanor area, Lake Almanor Campground had over 19,500 weekday visitation with peak season having the majority of use (92.4 percent) and an average of 183 RDs. Last Chance Campground/Group Camp had the fewest weekday RDs with peak season having the majority of use (67.5 percent) and an average of 11 RDs. In the Butt Valley Reservoir area, Ponderosa Flat Campground had 7,000 weekday RDs with peak season having the majority of use (92.1 percent) and an average of 75 RDs. Cool Springs Campground had approximately 33 percent of the RDs with an average of 31 and the majority during peak season. Belden Reach area campgrounds had a similar amount of use.

Table E5.2.2-18
Visits to Project Area Campgrounds—Weekdays 2001

Site	Total	Average	Early Non-Peak	Peak	Late Non-Peak
Lake Almanor Area Campgrounds					
Lake Almanor Campground	19,564	183	838	18,082	644
Last Chance Campground/Group Camp	736	11	28	497	211
Almanor Campground	8,736	79	445	7,902	389
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	2,233	31	88	2,144	22
Ponderosa Flat Campground	7,000	75	178	6,448	374
Belden Reach Area Campgrounds					
Queen Lily Campground	1,737	16	190	1,351	196
Gansner Bar Campground	2,995	21	679	1,845	471
North Fork Campground	2,679	21	362	1,986	331

Source: EDAW, Inc.

Gansner Bar Campground had 2,995 weekday RDs with peak season having the majority of use (61.6 percent) and an average of 21 RDs.

Queen Lily Campground had 1,737 weekday RDs with peak season having the majority of use (77.8 percent) and an average of 16 visits

E5.2.2.4.6.3 Weekend Occupancy at Project Area Campgrounds

Figures E5.2.2-14 through E5.2.2-21 describe weekend occupancy at campgrounds during 2001. Cool Springs Campground exceeded 100 percent for a weekend or more (see Figure E5.2.2-17), as did Queen Lily Campground (see Figure E5.2.2-19), Gansner Bar Campground (see Figure E5.2.2-20), and North Fork Campground (see Figure E5.2.2-21).

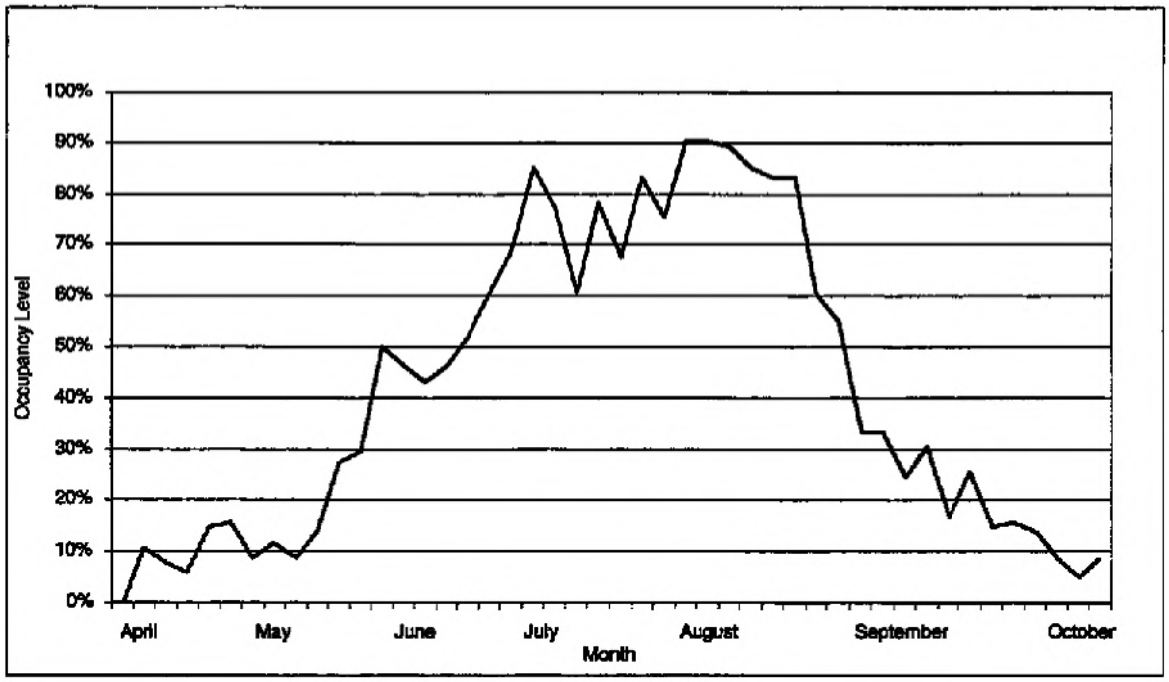


Figure E5.2.2-14
Almanor Campground 2001 Weekend Occupancy

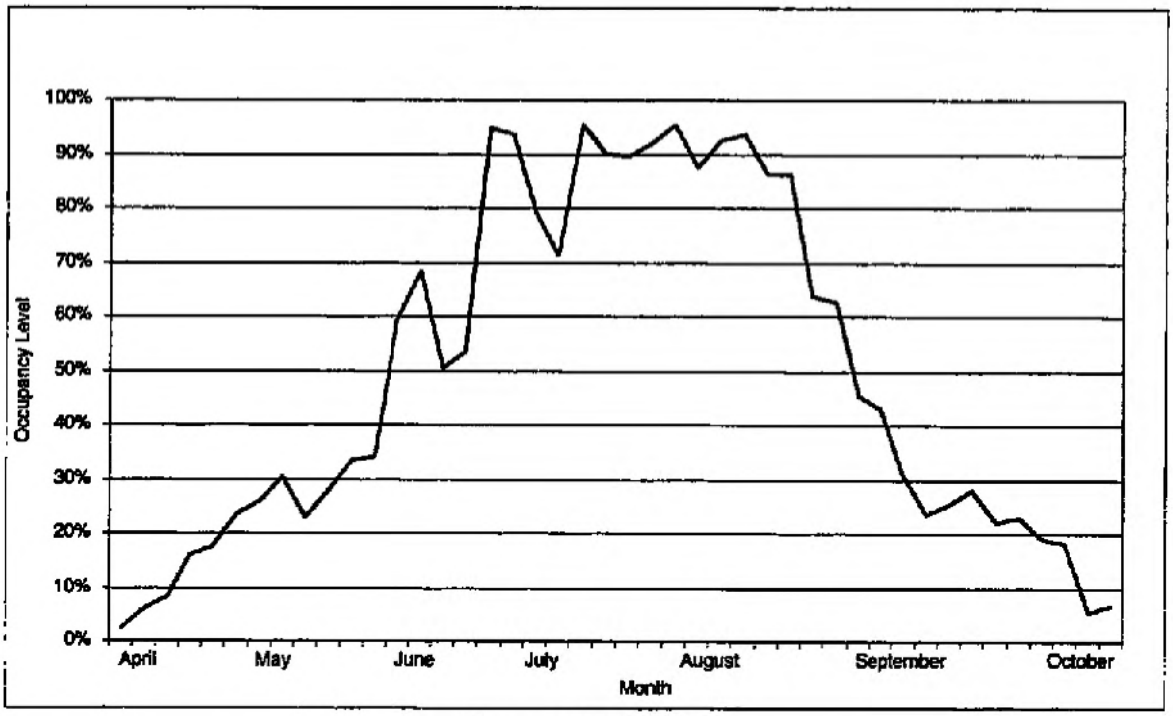


Figure E5.2.2-15
Lake Almanor Campground 2001 Weekend Occupancy

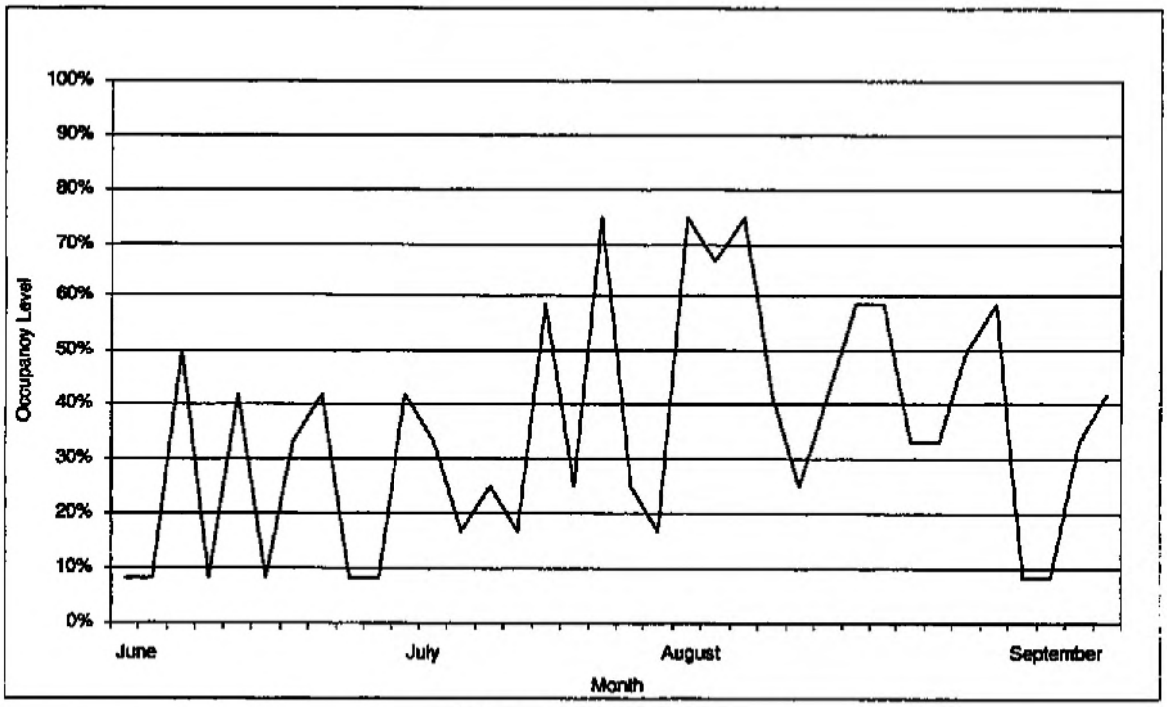


Figure E5.2.2-16
Last Chance Campground/Group Camp 2001 Weekend Occupancy

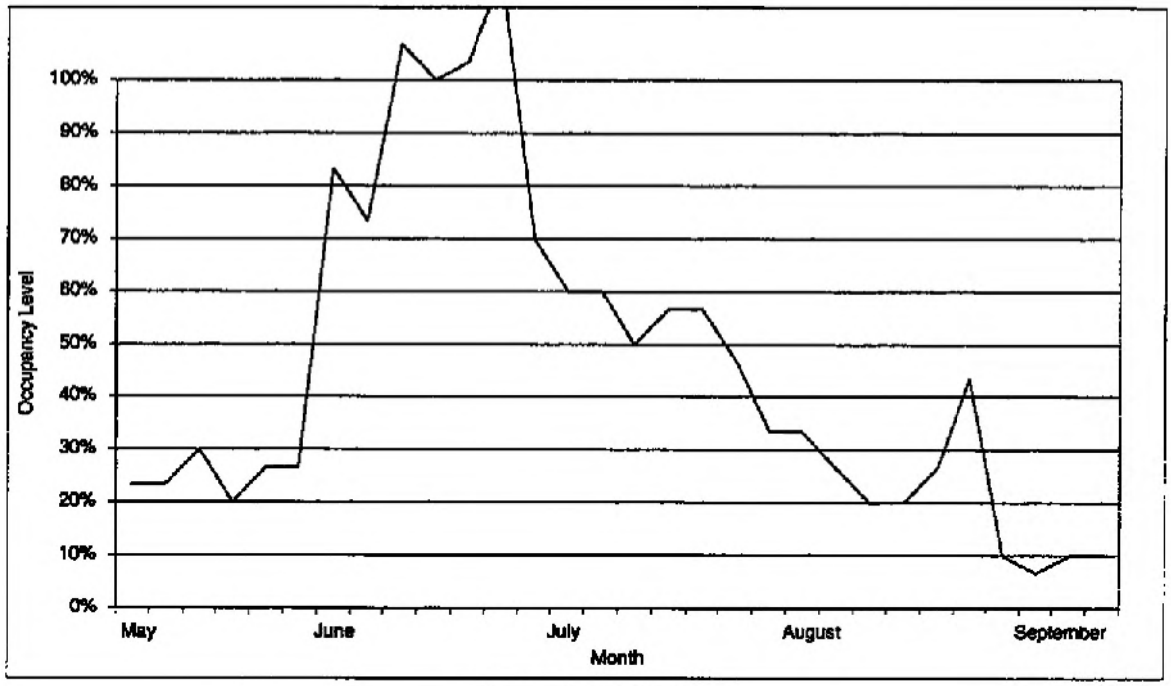


Figure E5.2.2-17
Cool Springs Campground 2001 Weekend Occupancy

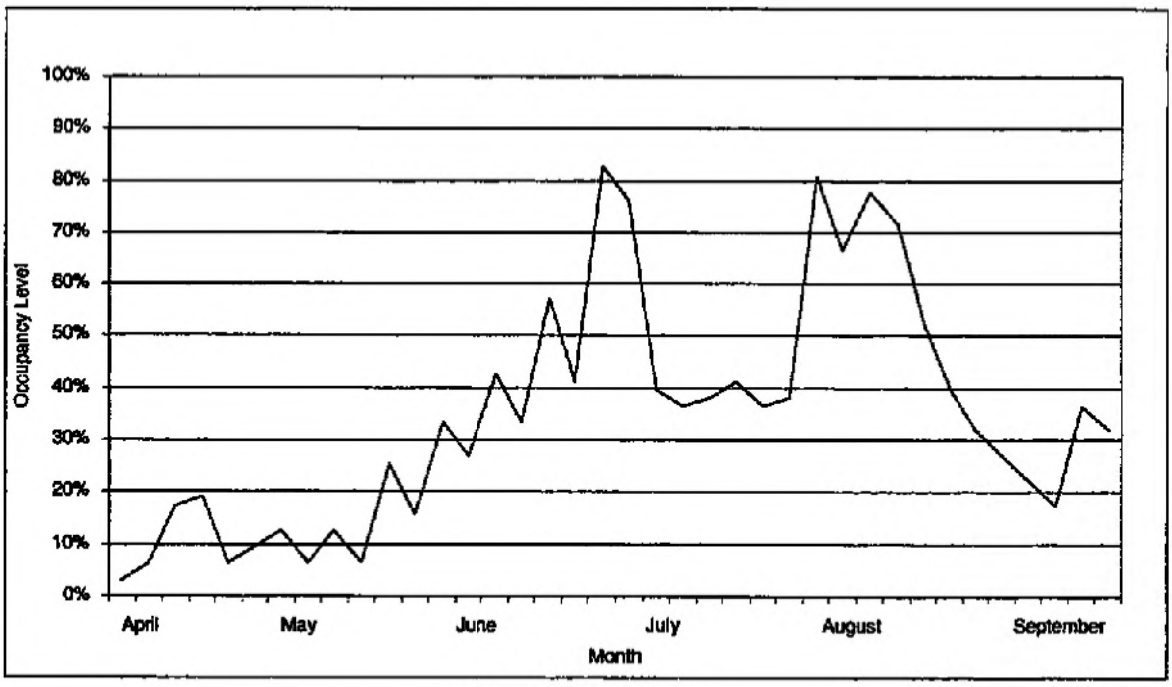


Figure E5.2.2-18
Ponderosa Flat Campground 2001 Weekend Occupancy

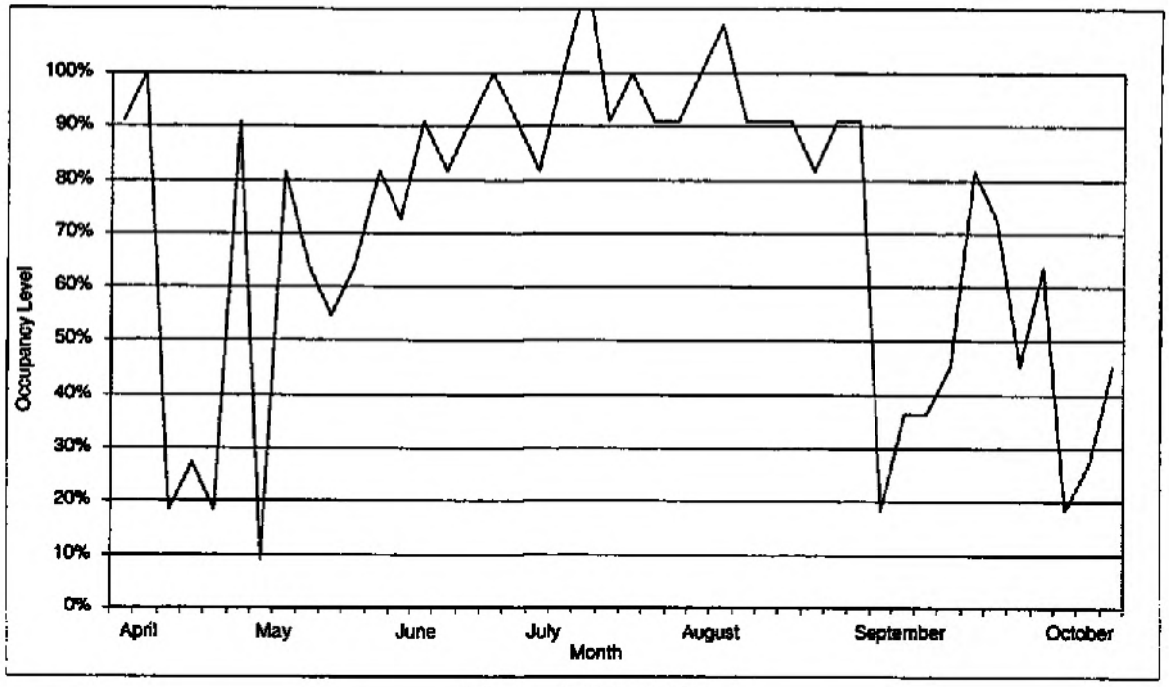


Figure E5.2.2-19
Queen Lily Campground 2001 Weekend Occupancy

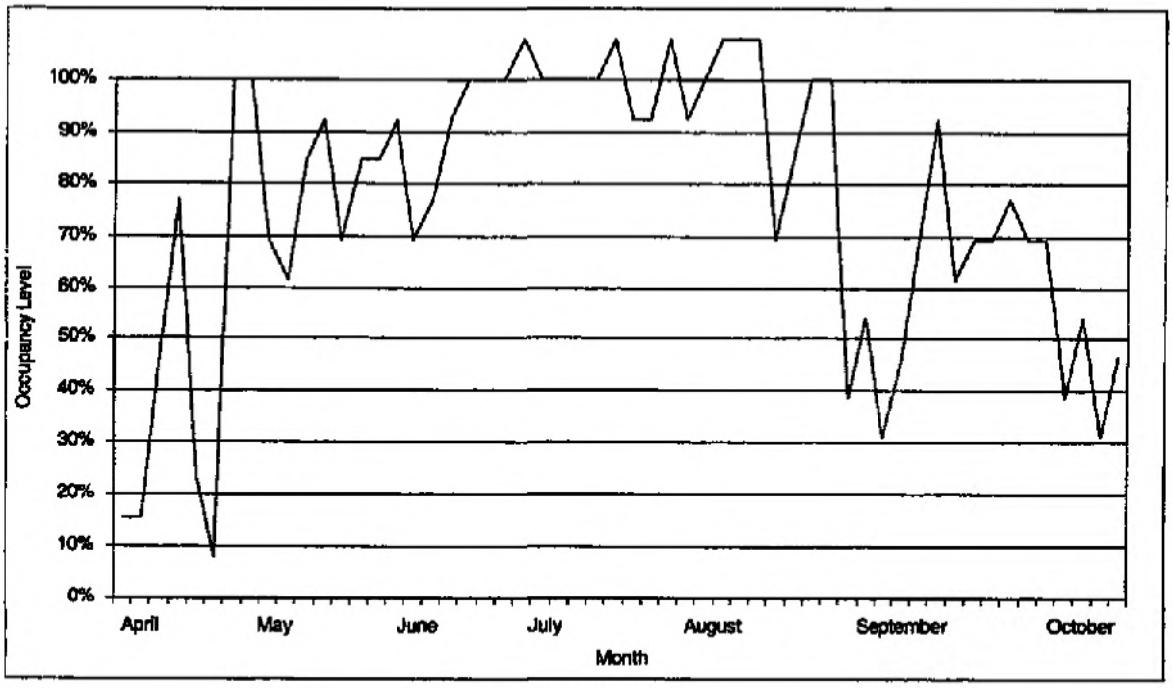


Figure E5.2.2-20
Gansner Bar Campground 2001 Weekend Occupancy

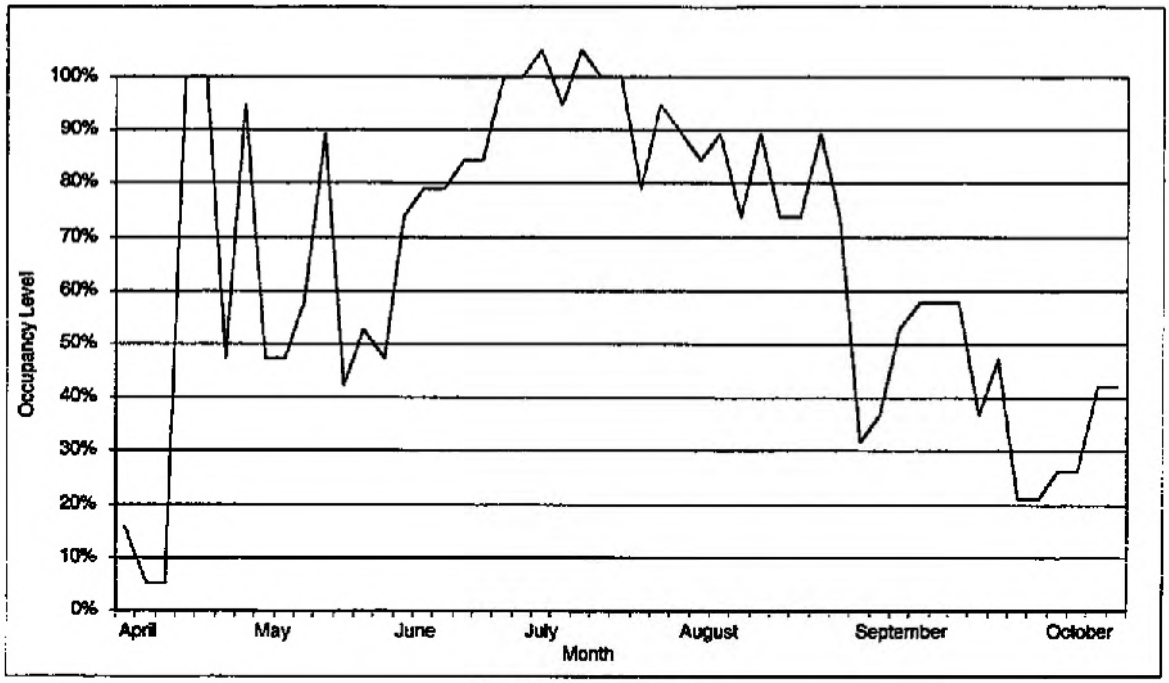


Figure E5.2.2-21
North Fork Campground 2001 Weekend Occupancy

Table E5.2.2-19 shows a breakdown of RDs by season and of weekday RDs by season for Project area resource areas. For the Lake Almanor area, Lake Almanor Campground had over 11,125 weekend RDs with peak season having the majority of use (89.1 percent) and an average of 253 RDs. Last Chance Campground/Group Camp had the fewest weekend RDs with peak season having the majority of use (79 percent) and an average of 18 RDs. In the Butt Valley Reservoir area, Ponderosa Flat Campground had 6,220 weekend RDs with peak season having the majority of use (90.7 percent) and an average of 156 RDs. Cool Springs Campground had less than 33 percent of the RDs with an average of 50 and the majority during peak season. In the Belden Reach area North Fork Campground had 2,145 weekend RDs with peak season having the majority of use (69.9 percent) and an average of 42 RDs.

Queen Lily Campground had the fewest weekend RDs (1,226) with peak season having the majority of use (74 percent) and an average of 28 RDs.

Table E5.2.2-19
Visits to Project Area Campgrounds—Weekends 2001

Site	Total	Average	Early Non-Peak	Peak	Late Non-Peak
Lake Almanor Area Campgrounds					
Lake Almanor Campground	11,125	253	472	9,911	742
Last Chance Campground/Group Camp	624	18	0	493	131
Almanor Campground	5,903	165	166	5,345	392
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	1,508	50	16	1,458	34
Ponderosa Flat Campground	6,220	156	211	5,642	367
Belden Reach Area Campgrounds					
Queen Lily Campground	1,226	28	145	907	174
Gansner Bar Campground	1,949	35	402	1,178	369
North Fork Campground	2,145	42	326	1,499	320

Source: EDAW, Inc.

E5.2.2.4.6.4 Holiday Occupancy at Project Area Campgrounds

This section describes holiday occupancy at Project area sites. Occupancy rates are illustrated by site in Figures E5.2.2-22 through E5.2.2-29.

Table E5.2.2-20 shows a breakdown of holiday RDs to Project area sites. For the Lake Almanor area, Lake Almanor Campground had over 4,232 holiday RDs with an average of 385 RDs. Last Chance Campground/Group Camp had the fewest holiday RDs with an average of 30. In the Butt Valley Reservoir area, Ponderosa Flat Campground had 1,570 holiday RDs with an average of 143 RDs. Cool Springs Campground had less than 33 percent of the RDs with an average of 40 RDs. In the Belden Reach area North Fork

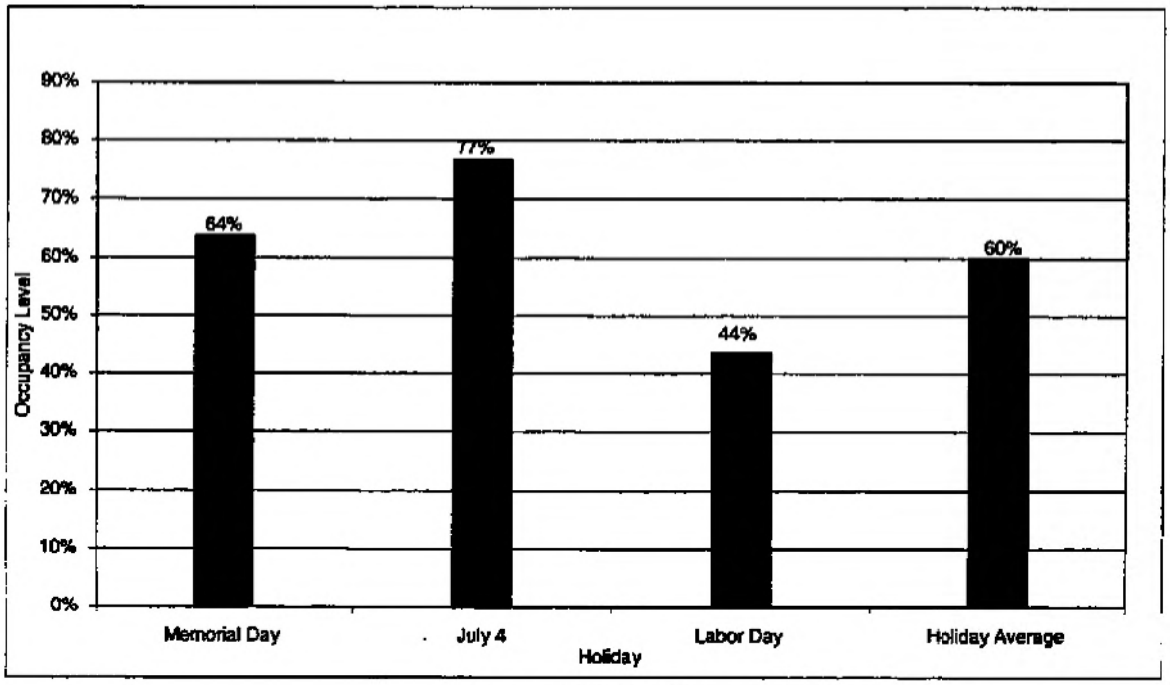


Figure E5.2.2-22
Almanor Campground 2001 Holiday Occupancy

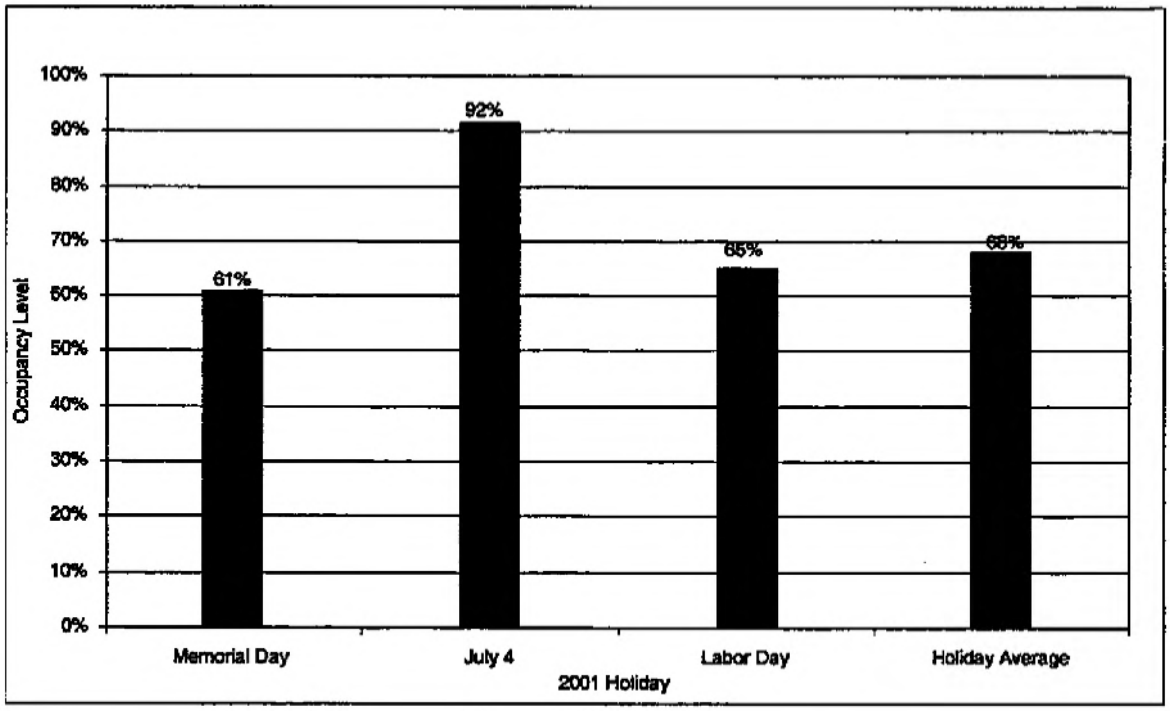


Figure E5.2.2-23
Lake Almanor Campground 2001 Holiday Occupancy

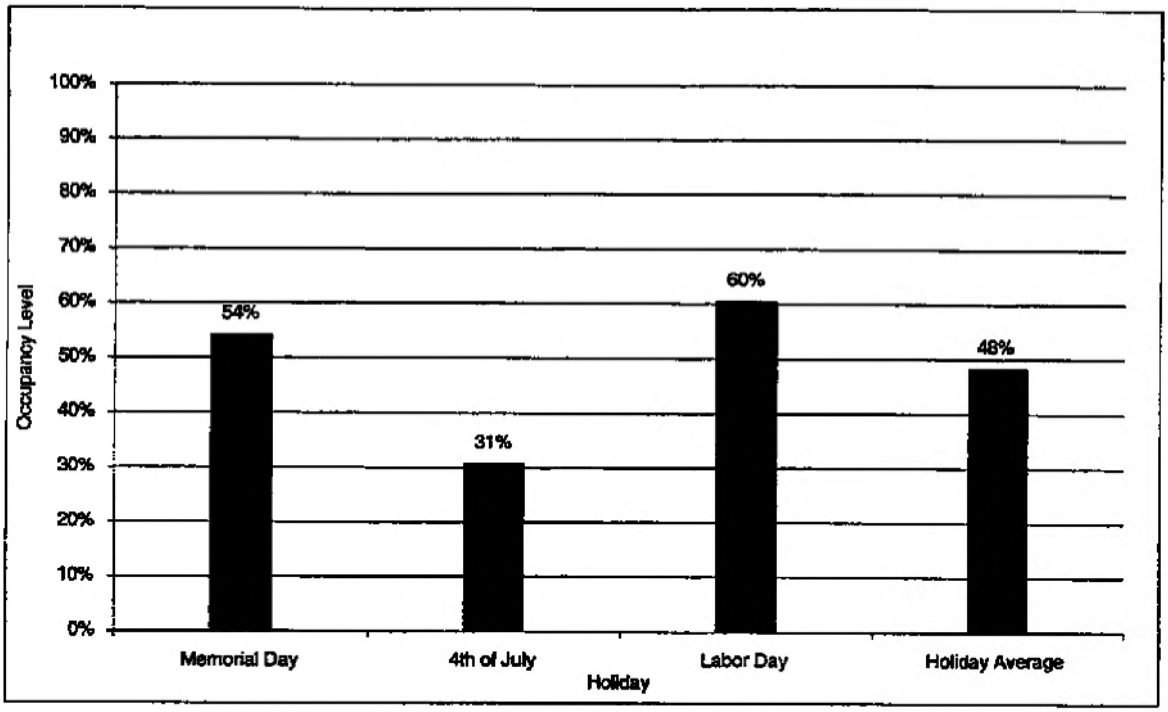


Figure E5.2.2-24
Last Chance Campground/Group Camp 2001 Holiday Occupancy

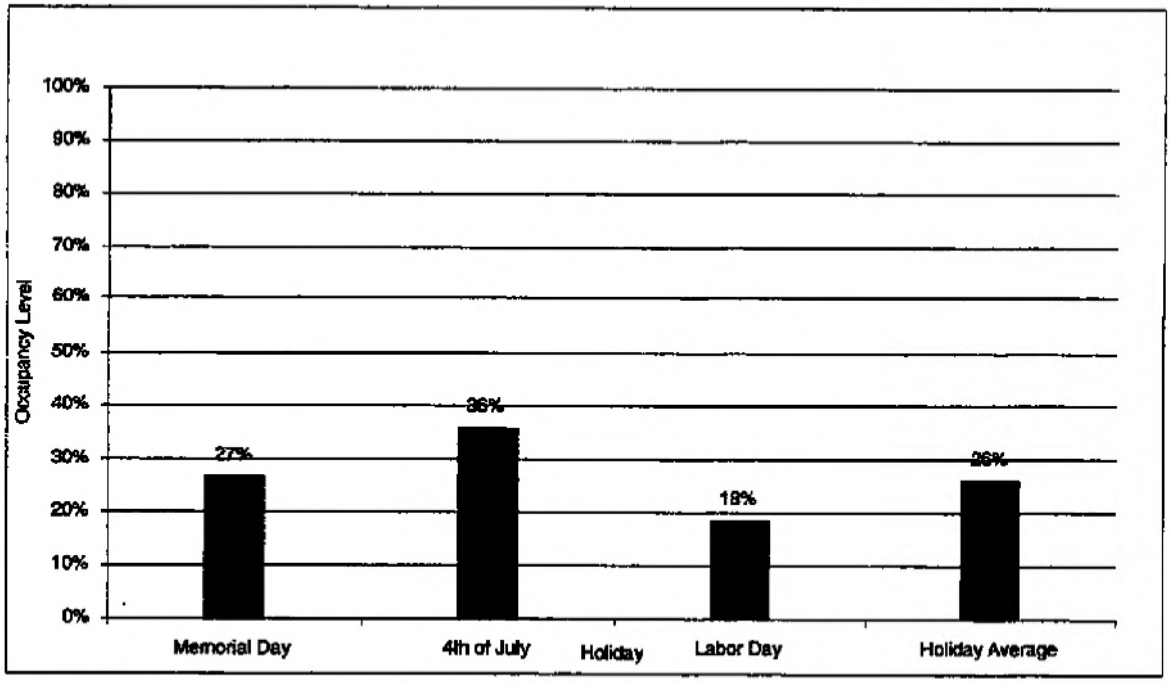


Figure E5.2.2-25
Cool Springs Campground 2001 Holiday Occupancy

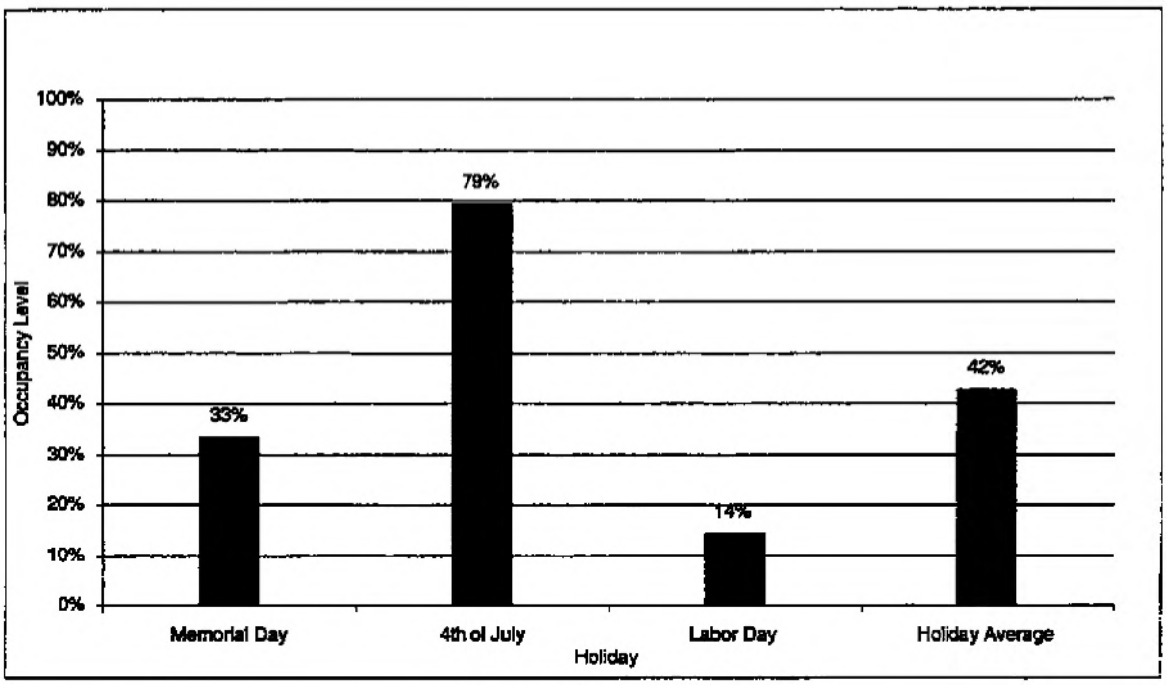


Figure E5.2.2-26
Ponderosa Flat Campground 2001 Holiday Occupancy

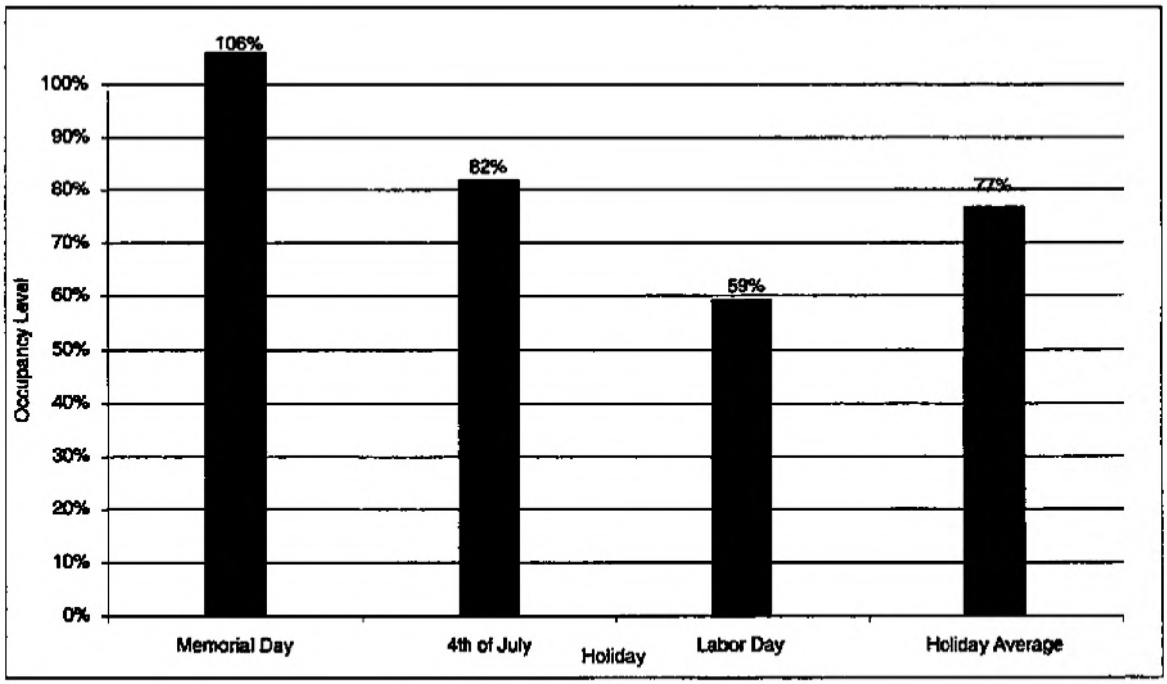


Figure E5.2.2-27
Queen Lily Campground 2001 Holiday Occupancy

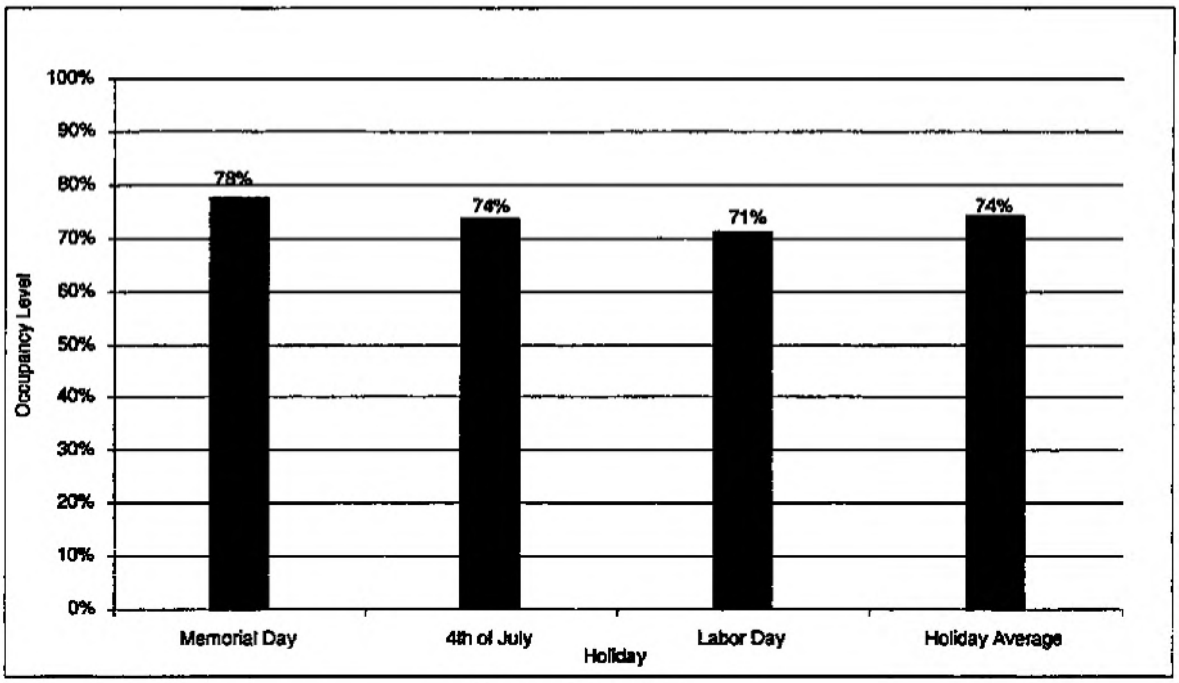


Figure E5.2.2-28
North Fork Campground 2001 Holiday Occupancy

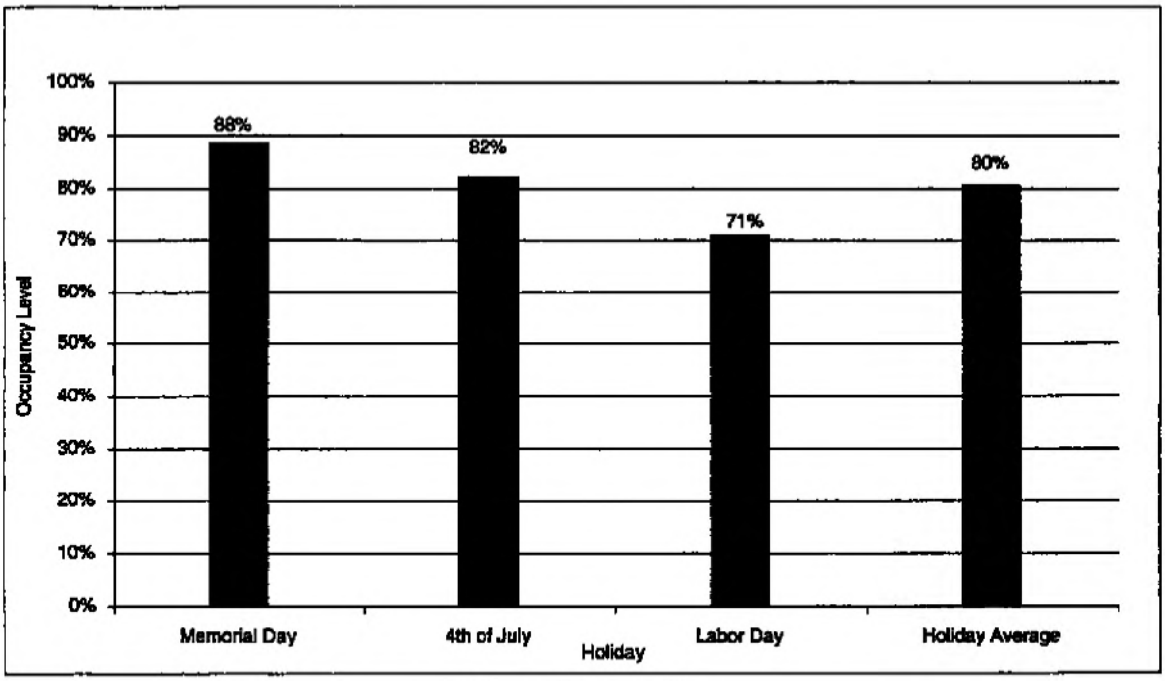


Figure E5.2.2-29
Gansner Bar Campground 2001 Holiday Occupancy

Campground had 548 holiday RDs with an average of 50 RDs. Queen Lily Campground had the fewest holiday RDs (approximately half of North Fork Campground) with an average of 48 RDs.

Table E5.2.2-20
Visitors to UNFFR Campgrounds—Holidays 2001

Site	Total	Average
Lake Almanor Area Campgrounds		
Lake Almanor Campground	4,232	385
Last Chance Campground/Group Camp	333	30
Almanor Campground	2,218	202
Butt Valley Reservoir Area Campgrounds		
Cool Springs Campground	439	40
Ponderosa Flat Campground	1,570	143
Belden Reach Area Campgrounds		
Queen Lily Campground	289	48
Gansner Bar Campground	452	41
North Fork Campground	548	50

Source: EDAW, Inc.

Table E5.2.2-21 shows a breakdown by of campground visits to all Project area resource areas for the entire season. For the Lake Almanor area, Lake Almanor Campground had almost 35,000 RDs with peak season having the majority of use (80.2 percent). Note that use during the peak season was substantially higher that the early and late seasons combined.

Last Chance Campground/Group Camp had the fewest RDs with peak season having the majority of use (58.5 percent). In the Butt Valley Reservoir area, Ponderosa Flat Campground had 14,790 RDs with peak season having the majority of use (81.7 percent). Note that use during the peak season was substantially higher that the early and late seasons combined. Cool Springs Campground had less than 33 percent of the RDs with

the vast majority during peak season. In the Belden Reach area, Gansner Bar Campground had 5,396 RDs with peak season having the majority of use (56 percent). Queen Lily had the fewest RDs (3,252) with peak season having the majority of use (69.4 percent). The entire Project area had 86,461 RDs with the vast majority of them occurring during peak season (77.1 percent). Note that use during the peak season was substantially higher that the early and late seasons combined.

Table E5.2.2-21
Project Area Campground Visits—Total 2001

Site	Total No. Visits	Average	Early Non-Peak	Peak	Late Non-Peak
Lake Almanor Area Campgrounds					
Lake Almanor Campground	34,921	820	1,310	27,993	1,386
Last Chance Campground/Group Camp	1,693	59	28	990	342
Almanor Campground	16,857	446	611	13,247	781
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	4,180	121	104	3,602	56
Ponderosa Flat Campground	14,790	373	389	12,090	741
Belden Reach Area Campgrounds					
Queen Lily Campground	3,252	92	335	2,258	370
Gansner Bar Campground	5,396	97	1,081	3,023	840
North Fork Campground	5,372	112	688	3,485	651
Totals	**86,461**	**265**	**4,546**	**66,688**	**5,167**

Source: EDAW, Inc.

Table E5.2.2-22 shows use at Project area campgrounds by season. For the Lake Almanor area, the seasonal use distribution among Campgrounds was similar as far as the majority of use occurred during the peak season. Among the campgrounds in the area, Last Chance Campground/Group Camp had a greater percent of its use during the late season and holidays than the other campgrounds in the area (less use occurred during the peak season, proportionally). The Butt Valley Reservoir area campgrounds had typical seasonal use with the majority occurring during the peak season. Seasonal use

distribution was also similar between the two campgrounds. Belden Reach area campgrounds had a fair amount of use during the late season (more than holiday use, which doesn't paralleled other sites). Among the campgrounds at this area, Gansner Bar had proportionally less use during the peak season than the others.

Table E5.2.2-22
Distribution of Use to Project Area Campgrounds During 2001 Season[1]

Site	Early Non-Peak (Percent)	Peak (Percent)	Late Non-Peak (Percent)	Holiday (Percent)
Lake Almanor Area Campgrounds				
Lake Almanor Campground	4	80	4	12
Last Chance Campground/Group Camp	2	58	20	20
Almanor Campground	4	79	5	13
Butt Valley Reservoir Area Campgrounds				
Cool Springs Campground	2	86	1	11
Ponderosa Flat Campground	3	82	5	11
Belden Reach Area Campgrounds				
Queen Lily Campground	10	69	11	9
Gansner Bar Campground	20	56	16	8
North Fork Campground	13	65	12	10

[1] *Percentages may not sum to 100 percent due to figure rounding.*

Source: EDAW, Inc.

E5.2.2.4.6.5 Campground Occupancy Equal or Exceeding Capacities—2001 Recreation Season

The following section describes campground use levels and occupancy levels for developed Licensee and Forest Service campgrounds throughout the Project area and discusses when campgrounds were at or above capacity. For all the following tables, early season begins when campgrounds open and ends the day before Memorial Day. Peak season begins Memorial Day and ends with the Labor Day weekend. Late season begins after Labor Day Weekend and ends when campgrounds close for the season.

There are no developed campgrounds in the Seneca Reach area, thus no information for the area is reported in this section.

Weekdays

Table E5.2.2-23 shows a breakdown of campground occupancy on weekdays for the Project area. None of the Lake Almanor area campgrounds were at or above capacity at any point during the recreation season. Combined, three campgrounds received a lot of use and apparently had enough sites to accommodate visitors because they never reached capacity on a non-holiday weekday. Both of the Butt Valley Reservoir area campgrounds were at capacity on more than one occasion during the recreation season. Cool Springs Campground was at or above capacity on 4 weekdays (6 percent) during the recreation season. Ponderosa Flat Campground was at or above capacity on 2 weekdays (2.2 percent) during the recreation season. Two of the three Belden Reach area campgrounds were at or above capacity on more than one occasion during the recreation season. Queen Lily Campground was at or above capacity on seven weekdays (6 percent) during the recreation season.

Gansner Bar Campground was at or above capacity on 11 weekdays (8 percent) during the recreation season. Overall, weekday occupancy ranged from 26 to 50 percent.

Weekends

Table E5.2.2-24 shows a breakdown of campground occupancy on weekends for the Project area. None of the Lake Almanor area campgrounds were at or above capacity on

Table E5.2.2-23
UNFFR Campground Sites Occupied—Weekdays 2001

Site	No. Days At or Above Capacity	Percent of Days At or Above Capacity	Total No. Occupied	Average No. Sites Occupied	Overall Weekday Occupancy (Percent)
Lake Almanor Area Campgrounds					
Lake Almanor Campground	0	0	5,905	56	35
Last Chance Campground/Group Camp	0	0	322	4	29
Almanor Campground	0	0	2,893	26	26
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	4	6	659	9	31
Ponderosa Flat Campground	2	2.2	2,416	27	41
Belden Reach Area Campgrounds					
Queen Lily Campgroumd	7	6	531	5	45
Gansner Bar Campground	11	8	921	7	50
North Fork Campground	0	0	894	7	36

Source: EDAW, Inc.

Table E5.2.2-24
Project Area Sites Occupied—Weekends 2001

Site	No. Days At or Above Capacity	Percent of Days At or Above Capacity	Total No. Occupied	Average No. Sites Occupied	Overall Weekend Occupancy (Percent)
Lake Almanor Area Campgrounds					
Lake Almanor Campground	0	0	3,389	77	49
Last Chance Campground/Group Camp	0	0	119	4	28
Almanor Campgroumd	0	0	1,865	51	42
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	4	14	1,508	50	173[1]
Ponderosa Flat Campground	0	0	832	22	34
Belden Reach Area Campgrounds					
Queen Lily Campground	7	16	345	8	73
Gansner Bar Campground	19	35	553	10	77
North Fork Campground	8	16	632	12	67

[1]*This site was above capacity.*

Source: EDAW, Inc.

a weekend at any point during the recreation season. Combined, the campgrounds received a lot of use and apparently had enough sites to accommodate visitors because they never reached capacity on a non-holiday weekend. In the Butt Valley Reservoir area, Cool Springs Campground was at or above capacity on 4 weekend days (14 percent) during the recreation season and reached 173 percent overall weekend occupancy. This is the only site in the Project area that exceeded overall weekend occupancy.

It means that among all recreation season weekends, there were almost 75 percent as many cars parked in the area of Cool Springs Campground as could fit into designated parking areas. All of the Belden Reach area campgrounds were at or above capacity on more than one occasion during the recreation season. Queen Lily Campground was at or above capacity on 7 weekend days (16 percent) during the recreation season. Gansner Bar Campground was at or above capacity on 19 weekend days (35 percent) during the recreation season. North Fork Campground was at or above capacity on 8 weekend days (16 percent) during the recreation season. Weekend occupancy ranged from 28 to 173 percent.

Holidays

Table E5.2.2-25 shows a breakdown of campground occupancy on holidays in the Project area. In the Lake Almanor area, Last Chance Campground/Group Camp was at or above capacity on 2 holiday days (18 percent) during the recreation season.

None of the Butt Valley Reservoir area campgrounds were at or above capacity on a holiday and overall holiday occupancy was 50 percent or less. All of the Belden Reach area campgrounds were at or above capacity on more than one occasion during the recreation season. North Fork Campground was at or above capacity on 2 holiday days (18 percent) during the recreation season. Queen Lily Campground was at or above capacity on 4 holiday days (36 percent) during the recreation season. Gansner Bar Campground was at or above capacity on 5 holiday days (45 percent) during the recreation season. Holiday occupancy ranged from 26 to 77 percent.

Table E5.2.2-25
Project Area Sites Occupied—Holidays 2001

Site	No. Days At or Above Capacity	Percent of Days At or Above Capacity	Total No. Occupied	Average No. Sites Occupied	Overall Holiday Occupancy (Percent)
Lake Almanor Area Campgrounds					
Lake Almanor Campground	0	0	1,204	109	68
Last Chance Campground/Group Camp	2	18	66	6	50
Almanor Campground	0	0	673	61	60
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	0	0	86	8	26
Ponderosa Flat Campground	0	0	345	31	50
Belden Reach Area Campgrounds					
Queen Lily Campground	4	36	93	16	77
Gansner Bar Campground	5	45	101	10	71
North Fork Campground	2	18	155	14	74

Source: EDAW, Inc.

Entire Season

Table E5.2.2-26 shows a breakdown of campground occupancy at Project area sites for the entire recreation season. In the Lake Almanor area, Last Chance Campground/Group

Camp was at or above capacity on 2 holiday days (1.4 percent) during the recreation season.

Both the Butt Valley Reservoir area campgrounds were at or above capacity during the recreation season. Ponderosa Flat Campground was at or above capacity on 2 days (1.4 percent) during the recreation season. Cool Springs Campground was at or above capacity on 8 days (7 percent) during the recreation season. All of the Belden Reach area campgrounds were at or above capacity on more than one occasion during the recreation season. North Fork Campground was at or above capacity on 10 days (5 percent) during the recreation season. Queen Lily Campground was at or above capacity on 18 holiday days (11 percent) during the recreation season.

Table E5.2.2-26
UNFFR Project Campground Sites Occupied—Total 2001

Site	No. Days At or Above Capacity	Percent of Days At or Above Capacity	Total No. Occupied	Average No. Occupied	Overall Occupancy (Percent)
Lake Almanor Area Campgrounds					
Lake Almanor Campground	0	0	10,498	242	14
Last Chance Campground/Group Camp	2	1.4	507	14	10
Almanor Campground	0	0	5,431	138	11
Butt Valley Reservoir Area Campgrounds					
Cool Springs Campground	8	7	2,253	67	22
Ponderosa Flat Campground	2	1.4	3,593	80	13
Belden Reach Area Campgrounds					
Queen Lily Campground	18	11	969	29	18
Gansner Bar Campground	35	17	1,575	27	20
North Fork Campground	10	5	1,681	33	16
Project Total			**26,507**		

Source: EDAW, Inc.

Gansner Bar Campground was at or above capacity on 35 days (35 percent) during the recreation season. Occupancy across the entire recreation season ranged from 10 to 22 percent.

Table E5.2.2-27 shows a breakdown of Project area site occupancy by all season types. In the Lake Almanor area, Lake Almanor Campground had 56 percent occupancy during the peak season, 15 percent for the early season, and 13 percent for the late season. Almanor Campground had 47 percent occupancy during the peak season, 6 percent for the early season, and 11 percent for the late season. Last Chance Campground/Group Camp stands out among Lake Almanor area campgrounds because it had the majority of its use during the early rather than the peak season. It had 44 percent occupancy during the early season, 35 percent for the peak season, and 9 percent

Table E5.2.2-27
Project Area Campground Occupancy—All Days by 2001 Non-Peak and Peak Season

Site	Early Non-Peak Sites Occupied	Early Non-Peak Occupancy (Percent)	Peak Sites Occupied	Peak Occupancy (Percent)	Late Non-Peak Sites Occupied	Late Non-Peak Occupancy (Percent)
Lake Almanor Area Campgrounds						
Lake Almanor Campground	513	15	8,200	56	581	13
Last Chance Campground/Group Camp	21	44	387	35	33	9
Almanor Campground	254	6	4,134	47	358	11
Butt Valley Reservoir Area Campgrounds						
Cool Springs Campground	54	15	1,022	37	12	8
Ponderosa Flat Campground	170	9	2,830	49	248	33
Belden Reach Area Campgrounds						
Queen Lily Campground	115	37	645	64	116	29
Gansner Bar Campground	305	44	868	73	301	72
North Fork Campground	277	36	1,000	58	249	25

Source: EDAW, Inc.

for the late season. Almanor Campground had 47 percent occupancy during the peak season, 6 percent for the early season, and 11 percent for the late season. In the Butt Valley Reservoir area, Cool Springs Campground had 37 percent occupancy during the peak season, 15 percent for the early season, and 8 percent for the late season. Ponderosa Flat Campground had 49 percent occupancy during the peak season, 9 percent for the early season, and 33 percent for the late season.

In the Belden Reach area, Queen Lily Campground had 64 percent occupancy during the peak season, 37 percent for the early season, and 29 percent for the late season. North Fork Campground had 58 percent occupancy during the peak season, 36 percent for the early season, and 25 percent for the late season. Gansner Bar Campground had 73 percent occupancy during the peak season, 44 percent for the early season, and 72 percent for the late season. Note that the late season occupancy for Gansner Bar Campground was almost as high as peak season occupancy.

E5.2.2.4.7 Private Resort Occupancy

The following section describes the occupancy rates of several of the private resorts within the Project area.

As Table E5.2.2-28 displays, 17 private resorts at Lake Almanor were identified by researchers in order to determine levels of use of private recreation facilities within the Project area. Private resort occupancy was reported for seven of the 17 resorts researchers attempted to contact. The seven resorts that provided occupancy estimates

represent approximately 41 percent of those identified as private suppliers of recreation at Lake Almanor. This is fairly representative sample based on two factors. Those represented are geographically distributed throughout Lake Almanor's shoreline and they offer a variety of amenities from tent camping to luxury motel rooms.

Table E5.2.2-28
Private Resorts Capacity and Percent Occupancy

Private Resorts	[1]Early Season (Percent)	[2]Peak Season (Percent)	[3]Late Season (Percent)	Capacity	Capacity Total	[4]Percent Occupancy
Big Cove Resort	95	100	95	35 RV, 8 cabin	43	96.7
Dorado Inn	60	95	45	7 cabins, 20 rooms	27	66.7
Knotty Pine Resort	60	92	60	6 cabins, 4 RV	10	70.7
Lake Haven Resort	80	95	75	10 cabins	10	83.3
Lassen View Resort	40	96	50	13 tent, 51 RV	64	62
Little Norway Resort	40	60	40	11 cabins, 1 RV	12	46.7
Plumas Pines Resort	70	100	70	8 cabins, 9 rooms, 63 RV	80	80
				Subtotal Resort Capacity	**246**	**N/A**
Private Resorts with Capacity Information but No Occupancy Data						
Almanor Lakefront Village				12 cabins	12	
Almanor Lakeside Resort				10 cabins	10	
High Sierra Resort				10 RV	10	
Lake Almanor Resort				14 rooms, 3 cabins	17	
Lake Cove Resort				51 tent, 46 RV	97	
North Shore Campground				120 RV and tent	120	
Novotny's				3 rooms	3	
Vagabond Resort				2 cabins	2	
Villager Resort				4 cabins	4	
Wilson's Camp Prattville				5 cabins, 34 RV	39	
				Subtotal Resort Capacity	**376**	
				Total	**560**	

[1]Previous to Memorial Day

[2]Memorial Day through Labor Day

[3]After Labor Day

[4]Average percent occupancy throughout sample season based on owner/operator estimate.

Source: EDAW, Inc.

As displayed in Table E5.2.2-28, owners and operators of resorts were asked to estimate, as best they could, use levels for the recreation season prior to Memorial Day (early season), use between Memorial Day and Labor Day (peak season), and use after Labor Day (late season). Early season use ranged from 40 to 95 percent and averaged 64 percent for resorts that reported.

Peak season use ranged from 60 to 100 percent and averaged 91 percent for resorts that reported. Late season use ranged between 40 to 95 percent and averaged 62 percent for resorts that reported. The average for all resorts that reported occupancy data for the whole sample season (early through late season) was 72 percent. It should be reported that researchers found (quantitatively) that several operators felt that the reservoir level negatively affected their business. Considering that this was a relatively low water year, an average of 72 percent occupancy for resorts that reported use suggests resorts still did fair business.

E5.2.2.4.8 Day Use Area Visitation

The total number of RDs at each of the Project area's DUAs are reported in this section. For the purposes of this study, an RD is defined as any person visiting an area for all or part of a 24-hour period. While the precise number of RDs at Project campgrounds was directly available through daily records made by campground host staff, such daily information on use levels at DUAs was not available. Day use estimates have been calculated based on traffic counter device readings at selected sites, while other day use estimates were made from manual traffic counts made by field researchers.

E5.2.2.4.8.1 Estimates of RDs

Estimates for RDs at Project DUAs utilized data collected from traffic counter devices placed at half of the Project area DUAs, and from manual traffic counter sessions conducted by field researchers at the other half of DUAs. RDs were calculated as described below, with results displayed in Table E5.2.2-29.

Table E5.2.2-29
Estimates for Recreation Days at DUAs Based on Traffic Counter Readings and Manual Traffic Counts

Location	Season	Days	No. of Vehicles	Recreation Days
Lake Almanor Public DUAs				
Almanor Boat Launch	April 23–Oct 6	167	8,386.1	19,288
Almanor Beach	April 23–Oct 6	167	15,004.4	34,510
Canyon Dam Boat Launch/DUA	April 23–Oct 14	175	34,513	79,380
Dyer View DUA	April 23–Oct 14	175	5,024.4	11,556[1]
Almanor Scenic Overlook	May 19–Oct 1	136	8,178	16,356
Canyon Dam DUA	May 19–Oct 1	136	12,710.4	29,234
Eastshore DUA	May 19–Oct 1	136	4,420	9,724[1]
Total Lake Almanor Public DUAs				**224,960**
Lake Almanor Private Areas				
Lake Almanor Country Club 1	April 23–Oct 14	175	32,114	80,285
Lake Almanor Country Club 2	April 23–Oct 14	175	8,592	21,480
Hamilton Branch DUA/Boat Launch	April 23–Oct 14	175	3,100.6	9,922
Lake Almanor West DUA	April 23–Oct 14	175	11,086.2	28,824
Lake Almanor West Boat Ramp	April 23–Aug 1	101	N/A	4,800
Total Lake Almanor Private DUAs				**169,299**
Total All Lake Almanor DUAs				**338,599**
Butt Valley Reservoir DUAs				
Alder Creek DUA/Boat Launch	May 4–Sept 24	143	9,746.7	17,544
Belden Reach DUAs				
Belden Rest Stop (SR 70)	Entire Year	365	76,367	175,644[2]
Total Project Area DUA Visits				**531,787**

[1] *Numbers do not equal the numbers in the Recreation Carrying Capacity Study due to differing assumptions about length of an RD.*

[2] *RDs based on all visitors to the rest stop, some of whom are not recreationists.*

Note: Multiplier values range between 1.8 and 3.2.

Source: EDAW, Inc.

Vehicle counts were combined with an average number of passengers per vehicle to determine the total RDs at each site in the study. Assumptions used to calculate estimates for the number of vehicles stopping at each DUA were different for the device-based data than for the manual counts.

From the traffic counter devices, the mean daily number of vehicles was derived for non-peak and peak season periods. In turn, these means were multiplied by the corresponding number of days in each season. From the manual observation data collected by field staff, hourly averages were determined for weekdays and weekend days. This hourly average was multiplied by eight, which researchers determined to be the typical daily use hourly period for each site after several observations sessions. These weekday/weekend averages were then multiplied by the number of corresponding days for the non-peak and peak season.

The number of people visiting a site was derived by multiplying the number of vehicles entering a site by the average number of passengers observed when vehicles entered individual DUAs. At sites with traffic counter devices, this was accomplished during the traffic counter calibration task. During manual traffic count sessions, the number of passengers per vehicle was recorded by field researchers. The average number of passengers in each vehicle ranged from 1.7 at lower used sites (rest stops and secondary Project roads) to 3.2 at higher used sites (picnic and beach areas). The Project area average number of people per vehicle was 2.3 passengers, suggesting that relatively small groups characterize RDs to most DUAs.

E5.2.2.4.8.2 Recreation Days: Assumptions by Location

Almanor Boat Launch

Estimates are based on traffic counter data, and assume the Project average of 2.3 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Almanor Beach

Estimates are based on traffic counter data, and assume the Project average of 2.3 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Canyon Dam Boat Launch/DUA

Estimates are based on traffic counter data, and assume the Project average of 2.3 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Dyer View DUA

Estimates are based on manual traffic count observations made by field staff, and assume the Project average of 2.3 people per vehicle.

Almanor Scenic Overlook

Estimates are based on manual traffic count observations made by field staff, and assume 2 people per vehicle.

Canyon Dam DUA

Estimates are based on traffic counter data, and assume the Project average of 2.3 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Eastshore DUA

Estimates are based on manual traffic count observations made by field staff, and assume 2.2 people per vehicle.

Lake Almanor Country Club 1

Estimates are based on traffic counter data, and assume the Project average of 2.5 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Lake Almanor Country Club 2

Estimates are based on manual traffic count observations made by field staff, and assume 2.5 people per vehicle.

Hamilton Branch Day Use Area/Boat Launch

Estimates are based on manual traffic count observations made by field staff, and assume 3.2 people per vehicle.

Lake Almanor West DUA

Estimates are based on traffic counter data, and assume the Project average of 2.6 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

Lake Almanor West Boat Ramp

Field observations from this site were not available. A consideration was also made for the boat ramp at this site becoming unusable mid-way through the recreation season, so the estimate was based on half the use of the comparable private site of Hamilton Branch.

Alder Creek DUA/Boat Launch

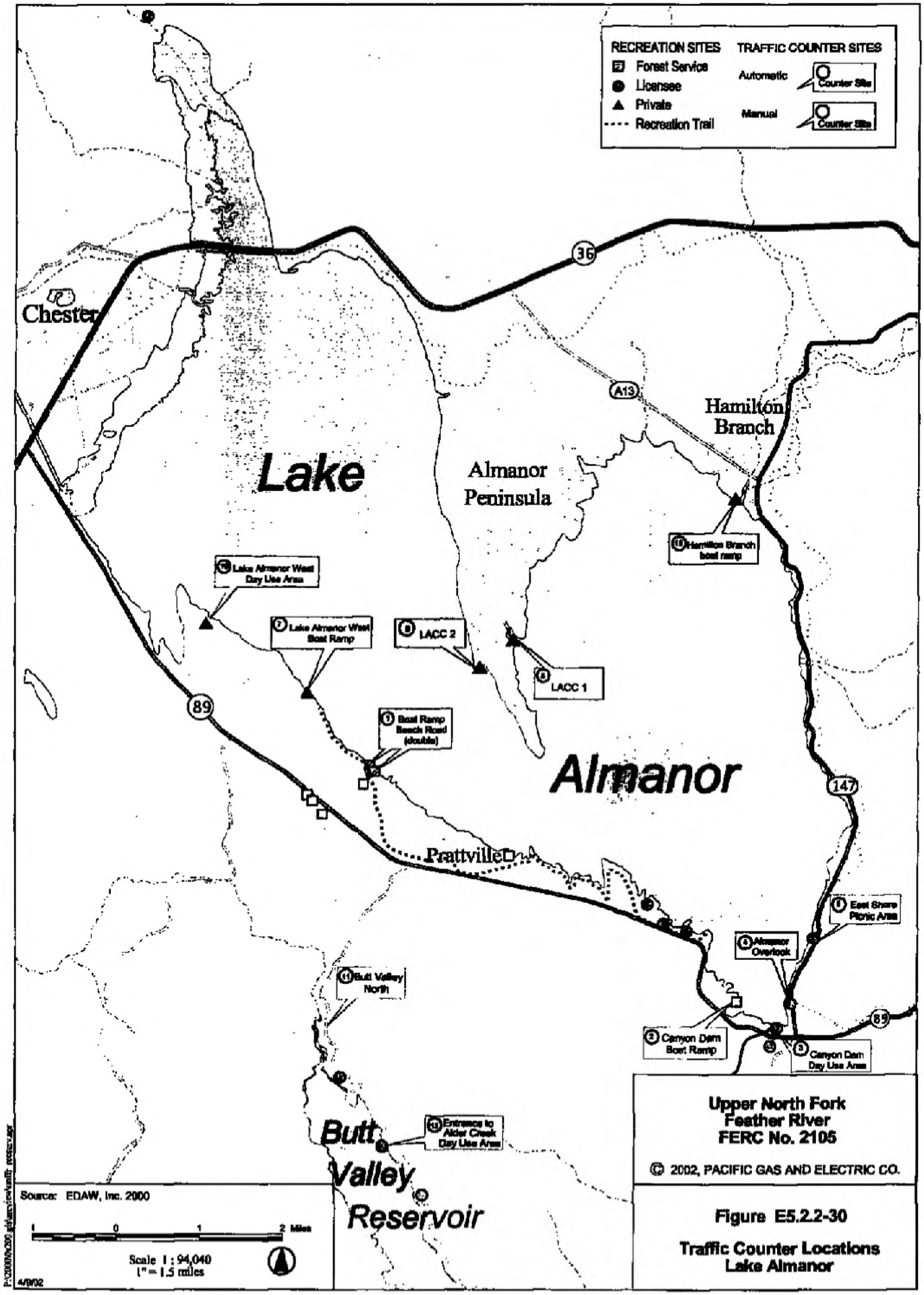
Estimates are based on traffic counter data, and assume 1.8 people per vehicle (based on the traffic counter calibration task). Vehicles enter and leave the site through the same point, so vehicle counts were halved.

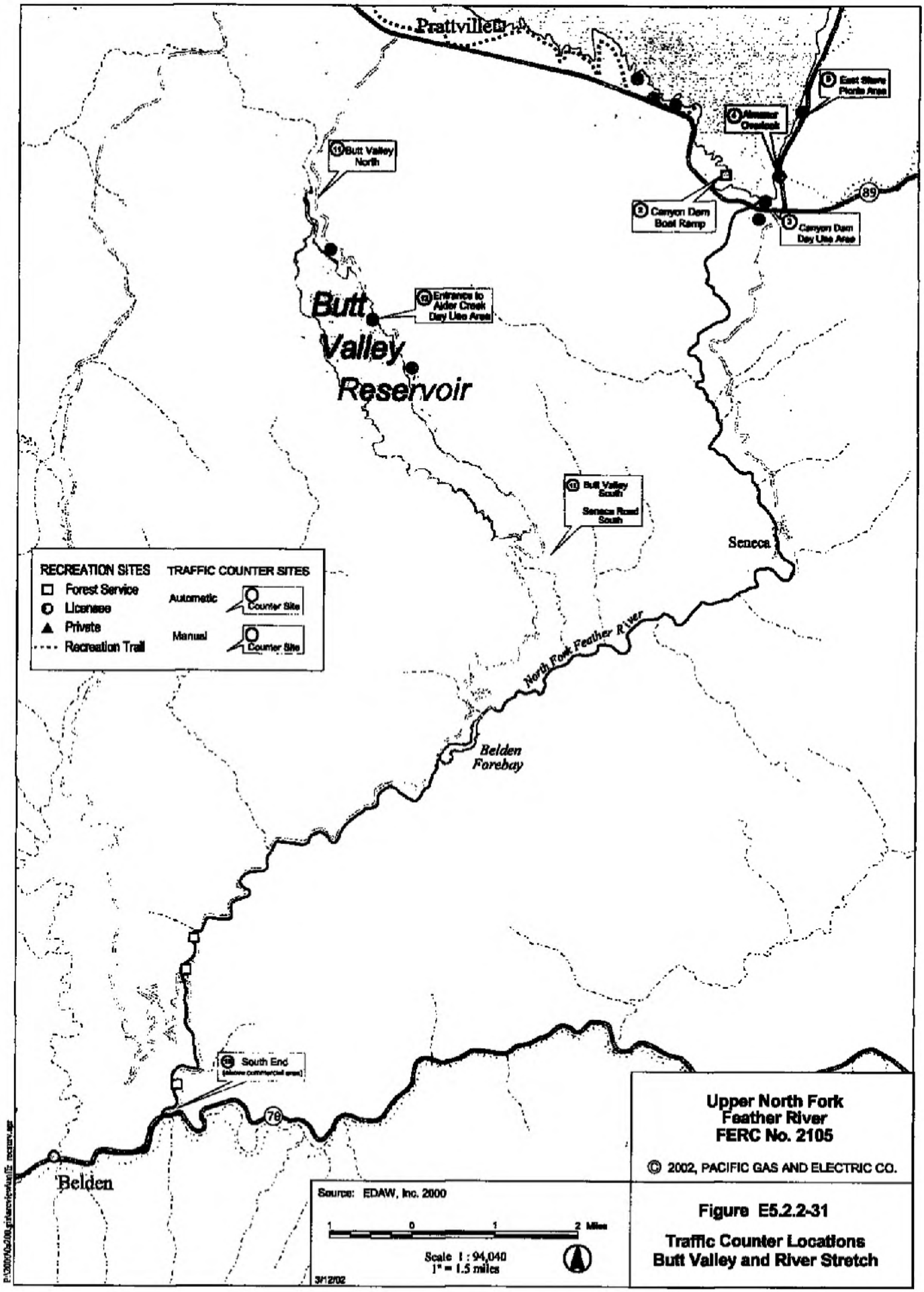
Belden Rest Stop (SR 70)

Estimates are based on manual traffic count observations and in-person interviews conducted by field staff, and assume 2.3 people per vehicle.

E5.2.2.4.8.3 Traffic Counter Information

Locations of traffic counter devices have been illustrated in Figures E5.2.2-30 and E5.2.2-31. Specific information relating to the average daily counts registered by traffic counter devices have been provided in Appendix E5-L.





E5.2.2.4.9 Distribution of Day Use Recreation Activities

The following section describes observed activity participation in the Lake Almanor, Butt Valley Reservoir, and the Belden and Seneca Reach areas, and distribution of those activities across sites. Participants were observed by field researchers who tallied the number of activities by site and day. Each selected site was sampled equally over the duration of the study. Day use sites were sampled primarily during mid-afternoon periods, which are typically the times of maximum use/utilization. Some sites were sampled earlier or later in the day based upon site-specific use patterns. Estimated maximum use/utilization times for each site was determined based on conversations with site owner/operators and during preliminary site visits. Activities are reported in tabular and graphical formats.

Table E5.2.2-30 displays the activities observed at the 20 Lake Almanor area sites. Canyon Dam Boat Launch/DUA (Figure E5.2.2-32) had 125 participants swimming and sunning (41 percent of the total use at the site and 24 percent of the use at the Project area) followed by picnicking with 64 people (21 percent of site and 18 percent of Project area). Dyer View DUA (Figure E5.2.2-33) had 54 participants swimming and sunning (45 percent of site and 10 percent of Project area) followed by general recreation with 31 people (26 percent of site and 6 percent of Project area). Almanor Boat Launch (Figure E5.2.2-34) had 36 participants swimming and sunning (41 percent of site and 7 percent of Project area) followed by general recreation with 31 people (35 percent of site and 6 percent of Project area).

Table E5.2.2-30
Lake Almanor Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Canyon Dam Boat Launch/DUA			
Swimming and Sunning	125	41	24
Picnicking	64	21	18
General Recreation	33	11	6
PWC Use	21	7	23
Bank Fishing	20	7	13
Rest Stop Use	15	5	13
Waterskiing	9	3	21
Biking/Hiking	8	3	6
Inflatable Boat Use	8	3	15
Equestrian	0	0	0
Windsurfing	0	0	0
Almanor Boat Launch			
Swimming and Sunning	36	41	7
General Recreation	31	35	6
PWC Use	9	10	10
Biking/Hiking	6	7	4
Inflatable Boat Use	3	3	6
Picnicking	2	2	1
Waterskiing	1	1	2
Bank Fishing	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Lake Almanor Country Club 1			
General Recreation	131	57	25
Swimming and Sunning	53	23	10
Biking/Hiking	17	7	12
Picnicking	12	5	3
PWC Use	6	3	7
Bank Fishing	6	3	4
Waterskiing	4	2	9
Inflatable Boat Use	1	0	2
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Dyer View DUA			
Swimming and Sunning	54	45	10
General Recreation	31	26	6
Biking/Hiking	11	9	8
Rest Stop Use	9	8	81
PWC Use	7	6	8
Waterskiing	7	6	8
Inflatable Boat Use	1	1	2
Bank Fishing	0	0	0
Picnicking	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Almanor Beach			
Swimming and Sunning	125	53	24
Picnicking	63	27	17
Inflatable Boat Use	14	6	26
General Recreation	18	8	3
Biking/Hiking	9	4	6
PWC Use	5	2	6
Rest Stop Use	3	1	3
Waterskiing	0	0	0
Bank Fishing	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Lake Almanor Country Club 2			
Swimming and Sunning	152	72	29
General Recreation	29	14	6
PWC Use	10	5	11
Inflatable Boat Use	7	3	13
Picnicking	5	2	1
Waterskiing	5	2	12
Biking/Hiking	2	1	1
Bank Fishing	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0

Table E5.2.2-30
Lake Almanor Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Lake Almanor West DUA			
General Recreation	137	41	26
Picnicking	103	31	28
Swimming and Sunning	82	24	16
Inflatable Boat Use	5	1	9
Biking/Hiking	4	1	3
Waterskiing	3	1	7
PWC Use	2	1	2
Bank Fishing	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Almanor Rest Stop (SR 89)			
Rest Stop Use	24	67	21
General Recreation	12	33	2
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/Hiking	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
LART Crossing at 1st House			
Biking/Hiking	7	100	5
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Lake Almanor West Boat Launch			
PWC Use	7	70	8
Biking/Hiking	3	30	2
Bank Fishing	0	0	0
Picnicking	0	0	0
Swim and Sunning	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0
Dyer View DUA/LART			
Biking/Hiking	6	100	4
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0
Super Channel Shoreline Access Site			
General Recreation	1	100	0
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/Hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0

Table E5.2.2-30
Lake Almanor Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Eastshore DUA			
Picnicking	15	29	4
Waterskiing	10	19	23
Biking/Hiking	9	17	6
Rest Stop Use	9	17	8
General Recreation	5	10	1
Bank Fishing	2	4	1
PWC Use	1	2	1
Swimming and Sunning	1	2	0
Equestrian	0	0	0
Windsurfing	0	0	0
Inflatable Boat Use	0	0	0
Canyon Dam DUA			
Swim and Sunning	30	25	6
Picnicking	28	23	8
General Recreation	25	21	5
Rest Stop Use	13	11	12
Bank Fishing	7	6	5
PWC Use	7	6	8
Inflatable Boat Use	7	6	13
Biking/Hiking	2	2	1
Waterskiing	1	1	2
Equestrian	0	0	0
Windsurfing	0	0	0
LART—South Trailhead			
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/Hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Almanor Scenic Overlook			
Rest Stop Use	5	100	4
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/Hiking	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0
Hamilton Branch DU/ Boat Launch			
PWC Use	14	37	16
General Recreation	10	26	2
Swimming and Sunning	7	18	1
Waterskiing	3	8	7
Biking/Hiking	2	5	1
Inflatable Boat Use	2	5	4
Bank Fishing	0	0	0
Picnicking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Pull-out West of Canyon Dam			
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

Table E5.2.2-30
Lake Almanor Area Activity Participation Observations by Site (Continued)

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Site South of Almanor Scenic Overlook			
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
East Entrance to Dyer View DUA			
Bank Fishing	0	0	0
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Biking/hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

[1] *These percentages reflect the proportion each individual site count comprises in proportion to the total number of people in the study observed doing the activity. Source: EDAW, Inc.*

As Table E5.2.20-30 displays, Almanor Beach (Figure E5.2.2-35) had 125 participants swimming and sunning (53 percent of site and 24 percent of Project area) followed by picnicking with 63 people (27 percent of site and 17 percent of Project area). Lake Almanor Country Club 1 (Figure E5.2.2-36) had 131 participants in general recreation (57 percent of site and 25 percent of Project area) followed by swimming and sunning with 53 people (23 percent of site and 10 percent of Project area). Lake Almanor Country Club 2 (Figure E5.2.2-37) had 152 participants in swimming and sunning (72 percent of site and 29 percent of Project area) followed by general recreation with 29 people (14 percent of site and 6 percent of Project area).

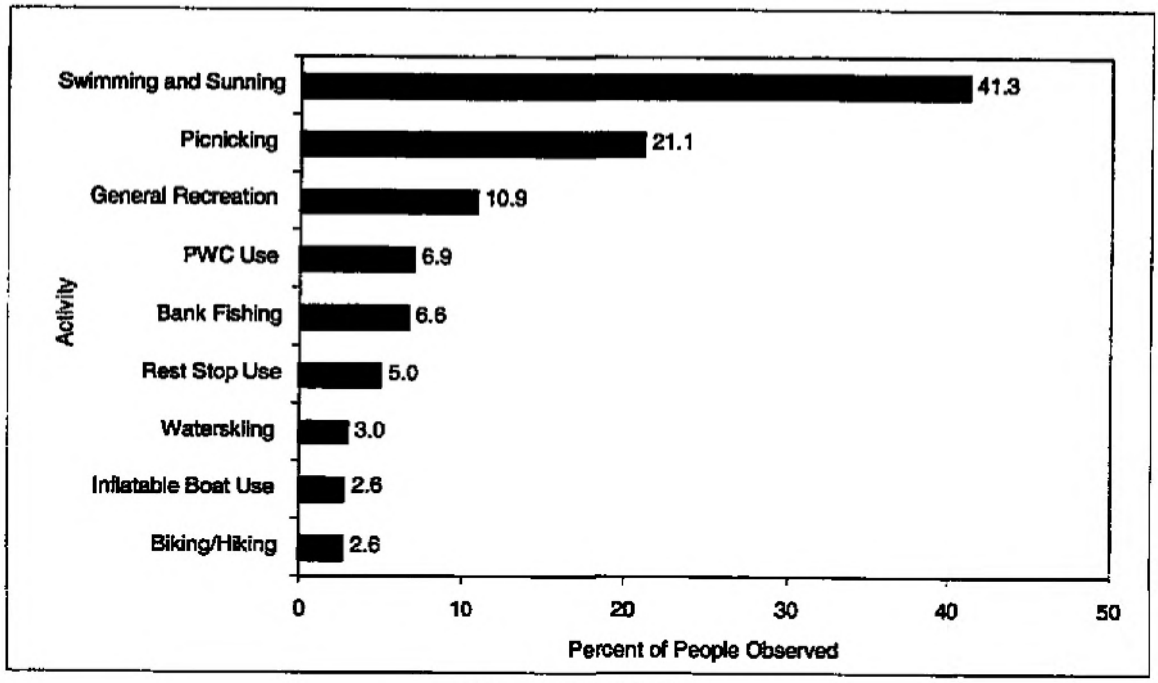


Figure E5.2.2-32
Most Common Activities at Canyon Dam Boat Launch/DUA

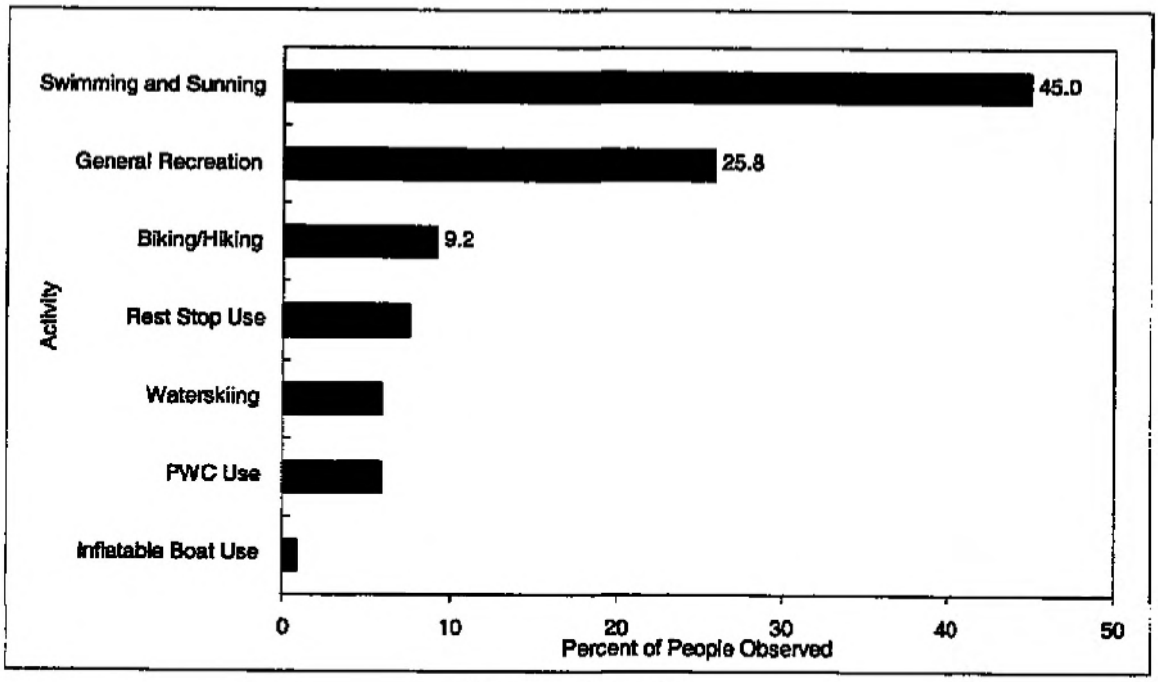


Figure E5.2.2-33
Most Common Activities at Dyer View DUA

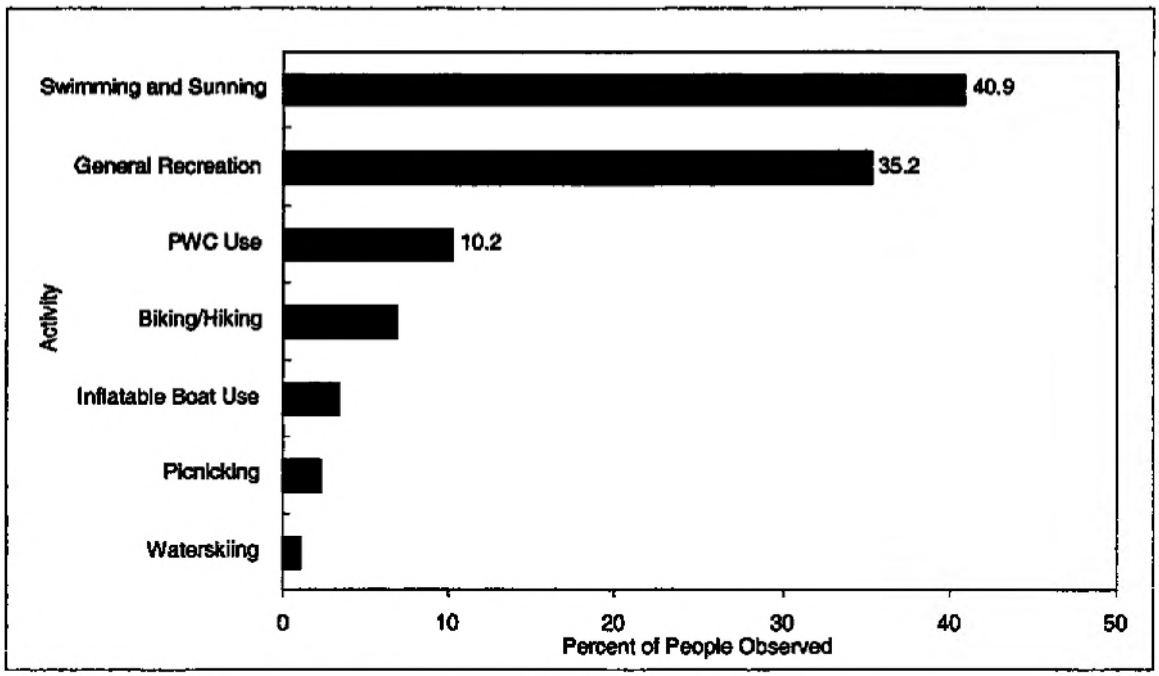


Figure E5.2.2-34
Most Common Activities at Almanor Boat Launch

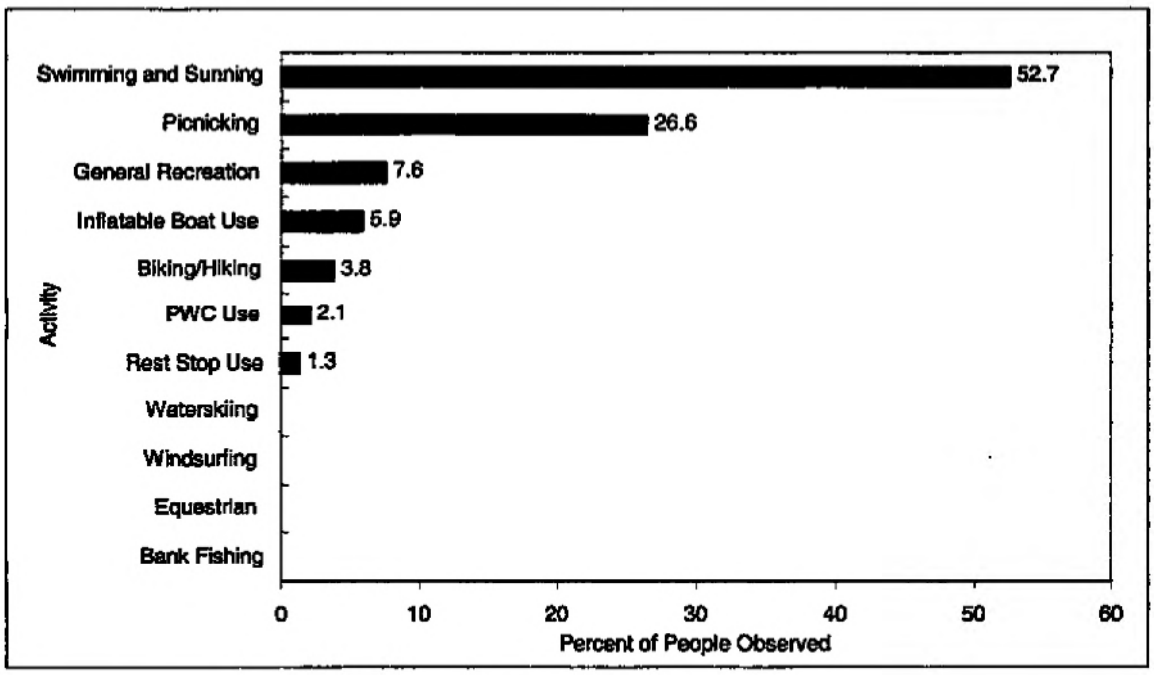


Figure E5.2.2-35
Most Common Activities at Almanor Beach

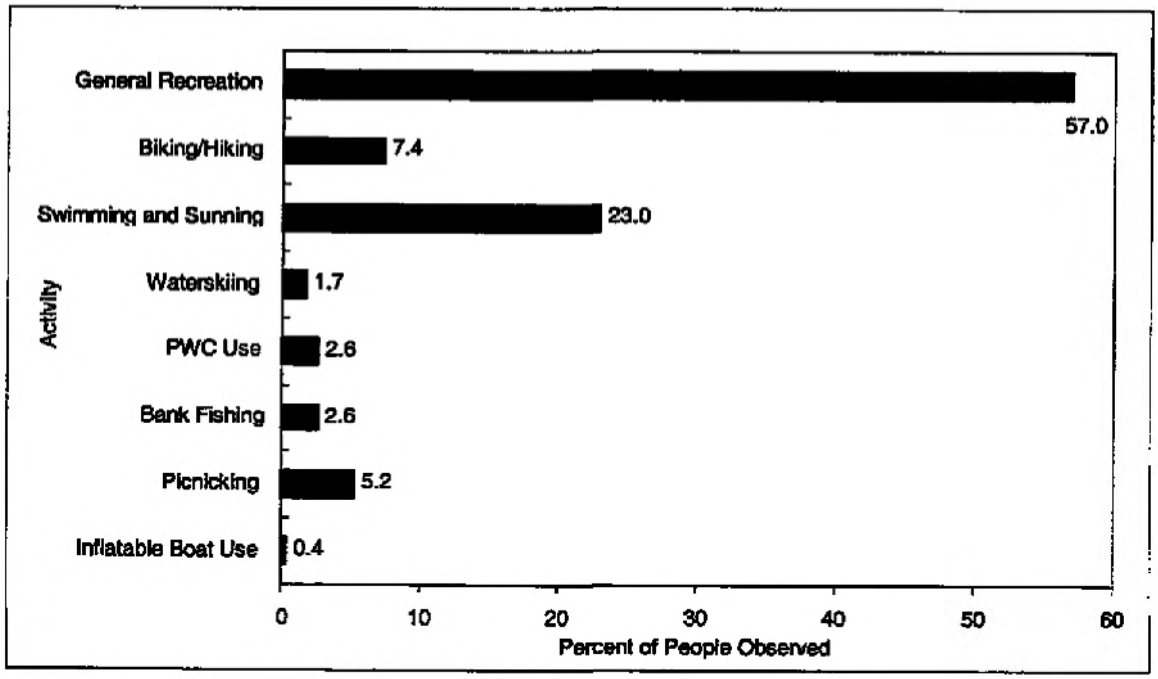


Figure E5.2.2-36
Most Common Activities at Lake Almanor Country Club 1

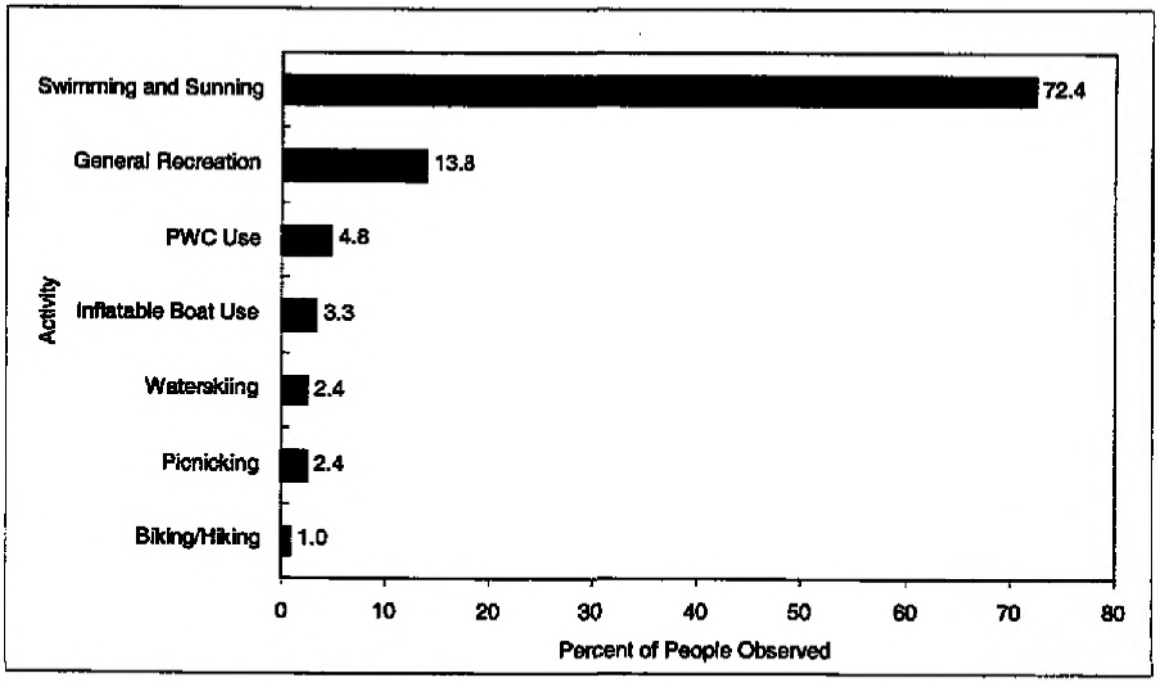


Figure E5.2.2-37
Most Common Activities at Lake Almanor Country Club 2

As Table E5.2.2-30 displays, Lake Almanor West DUA (Figure E5.2.2-38) had 137 participants in general recreation (41 percent of site and 26 percent of Project area) followed by picnicking with 103 people (31 percent of site and 28 percent of Project area). Lake Almanor West Boat Launch (Figure E5.2.2-39) had seven participants in PWC use (70 percent of site and 8 percent of Project area) followed by biking and hiking with three people (30 percent of site and 2 percent of Project area). Almanor Rest Stop (SR 89) (Figure E5.2.2-40) had 24 participants in rest stop use (67 percent of site and 21 percent of Project area) followed by general recreation with 12 people (33 percent of site and 2 percent of Project area).

As Table E5.2.2-30 displays, Dyer View DUA/LART Crossing had six participants in biking/hiking (100 percent of site and 4 percent of Project area) followed by no other activities.

LART Crossing at the first house had seven participants in biking/hiking (100 percent of site and 5 percent of Project area) followed by no other activities. The Super Channel Shoreline Access Site had one participant in general recreation (100 percent of site and 0 percent (virtually) of Project area) followed by no other activities.

As Table E5.2.2-30 displays, Eastshore DUA (Figure E5.2.2-41) had 15 participants in picnicking (29 percent of site and 4 percent of Project area) followed by waterskiing with 10 people (19 percent of site and 23 percent of Project area). Almanor Scenic Overlook

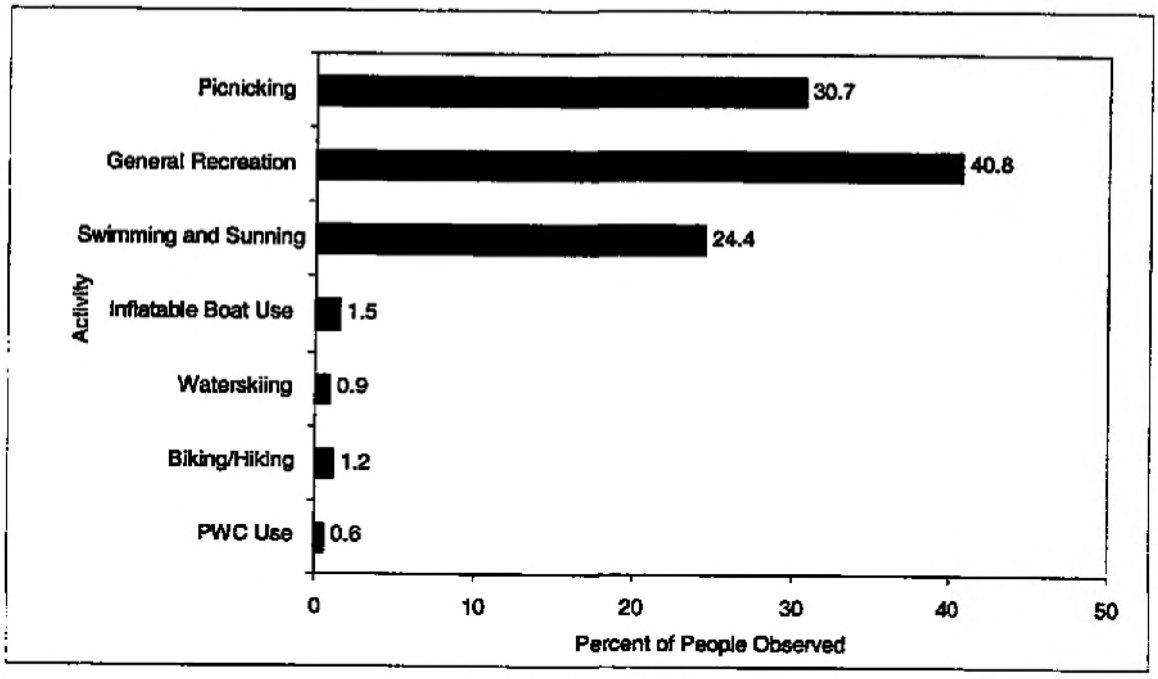


Figure E5.2.2-38
Most Common Activities at Lake Almanor West DUA

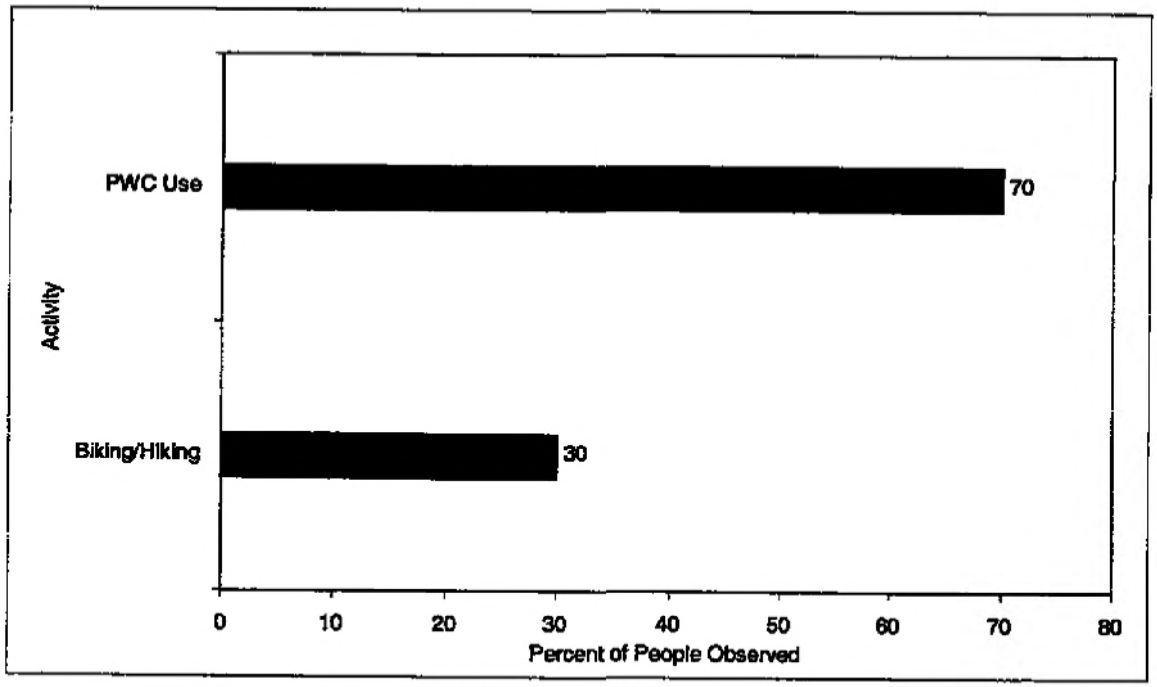


Figure E5.2.2-39
Most Common Activities at Lake Almanor West Boat Launch

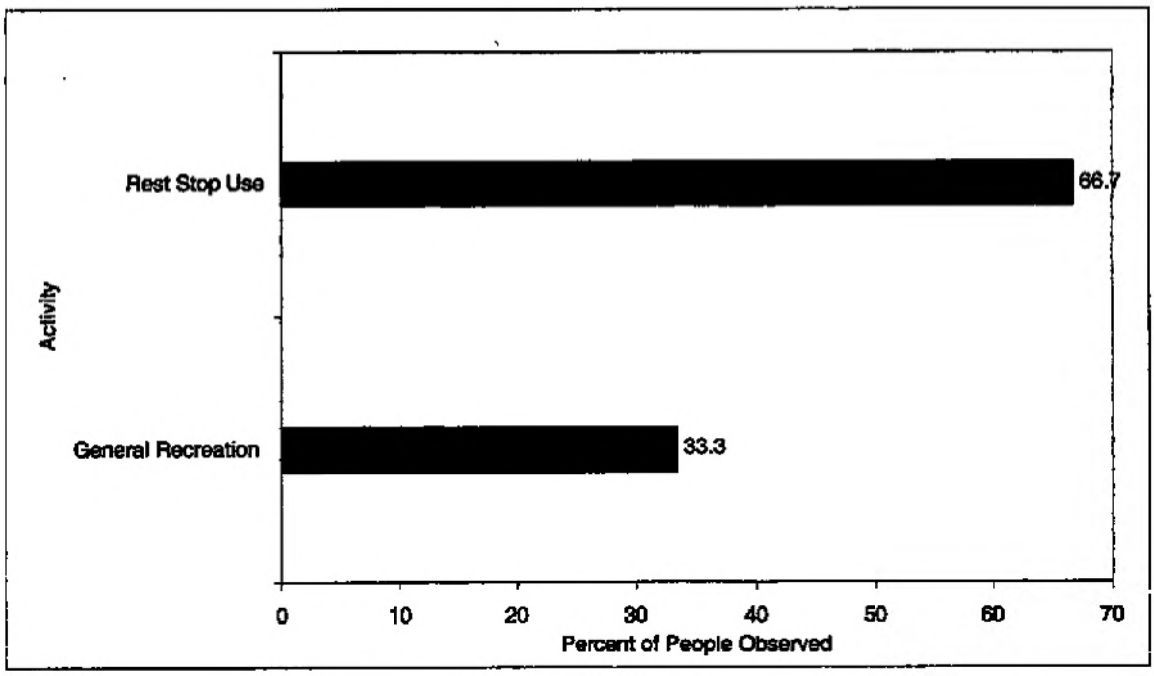


Figure E5.2.2-40
Most Common Activities at Almanor Rest Stop (SR 89)

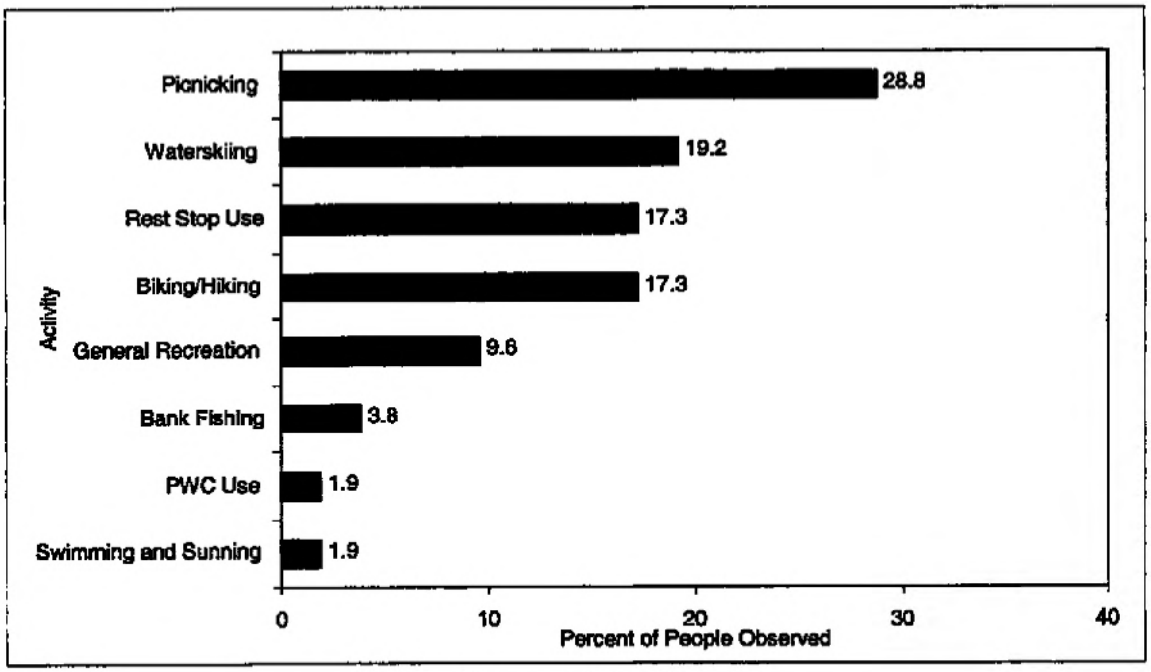


Figure E5.2.2-41
Most Common Activities at Eastshore DUA

(Figure E5.2.2-42) had five participants in rest stop use (100 percent of site and 4 percent of Project area) followed by no other activities.

Canyon Dam DUA (Figure E5.2.2-43) had 30 participants in swimming and sunning (25 percent of site and 6 percent of Project area) followed by picnicking with 28 people (23 percent of site and 8 percent of Project area).

As Table E5.2.2-30 displays, Hamilton Branch DUA/Boat Launch (Figure E5.2.2-44) had 14 participants in PWC use (37 percent of site and 16 percent of Project area) followed by general recreation with 10 people (26 percent of site and 2 percent of Project area). None of the remaining Lake Almanor sites had observed activities during the sample dates. These sites include: LART—South Trailhead, the pull-out west of Canyon Dam, the site to south of Almanor Scenic Overlook, and the east entrance to Dyer View DUA.

Table E5.2.2-31 displays the activities observed at the six Butt Valley Reservoir area sites. The dispersed site: Butt Creek Main Access Road, had 21 bank fishing participants (87.5 percent of site and 33 percent of Project area) followed by biking/hiking with two people (8.3 percent of site and 8 percent of Project area). The dispersed site: Butt Valley Powerhouse to Ponderosa Flat Campground, had 26 bank fishing participants (70 percent of site and 41 percent of Project area) followed by a tie between picnicking and biking/hiking with four people each (each with 11 percent of site and 16 percent of

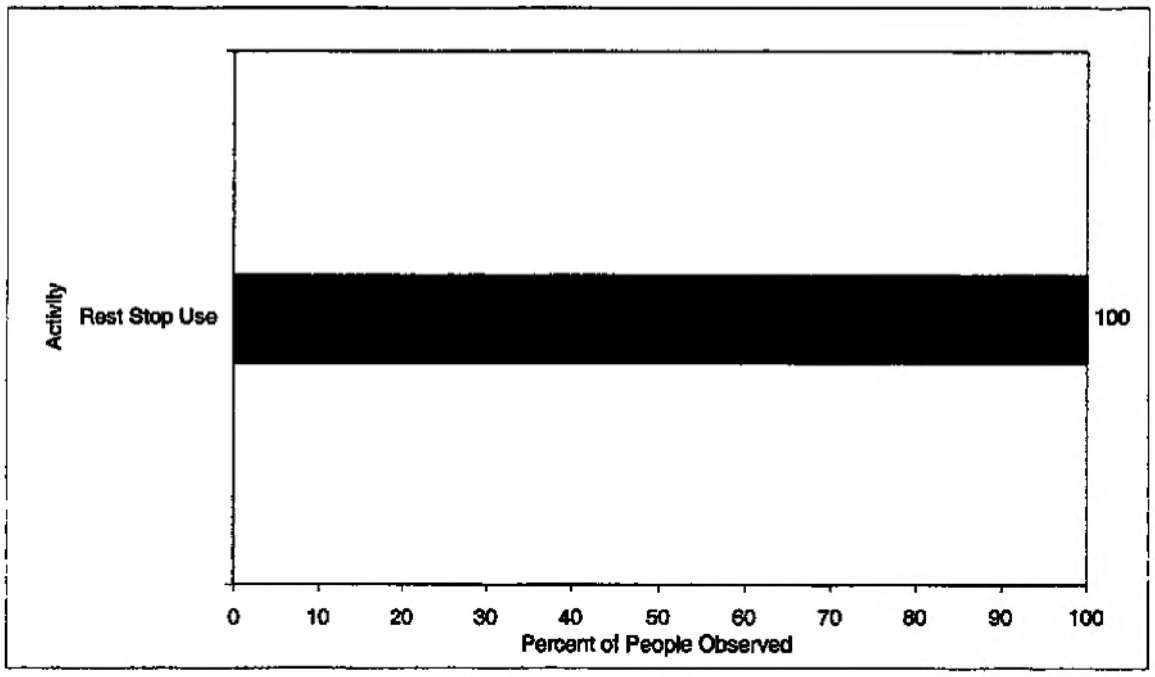


Figure E5.2.2-42
Most Common Activities at Almanor Scenic Overlook

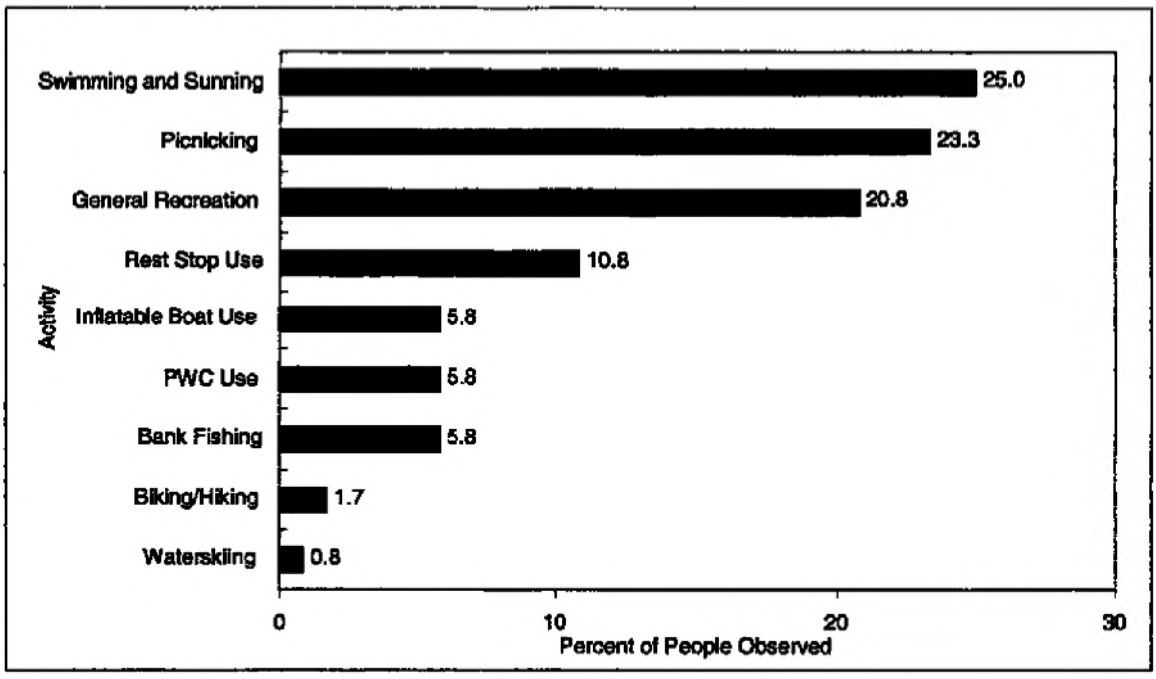


Figure E5.2.2-43
Most Common Activities at Canyon Dam DUA

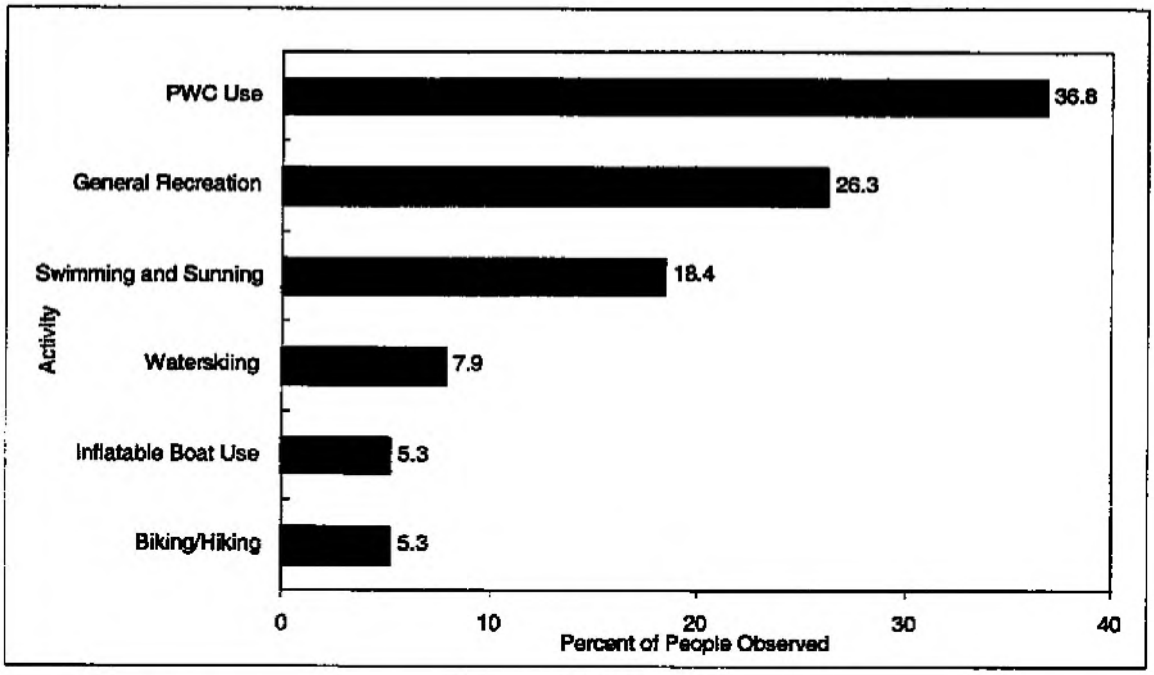


Figure E5.2.2-44
Most Common Activities at Hamilton Branch DUA/Boat Launch

Project area). The dispersed site: Ponderosa Flat Campground to Alder Creek DUA/Boat Launch, had five picnicking participants and five biking/hiking participants (each with 50 percent of site and 20 percent of Project area).

As Table E5.2.2-31 displays, Alder Creek DUA/Boat Launch had nine picnicking participants (27 percent of site and 36 percent of Project area) followed by swimming and sunning with eight people (24 percent of site and 40 percent of Project).

The dispersed site: Alder Creek DUA/Boat Launch to Cool Springs Campground had seven participants in general recreation (33 percent of site and 41 percent of Project) followed by bank fishing (24 percent of site and 8 percent of Project area). The dispersed site: Cool Springs Campground to Butt Valley Dam, had nine participants in swimming

Table E5.2.2-31
Butt Valley Reservoir Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Butt Creek Main Access Road			
Bank Fishing	21	87.5	33
Biking/Hiking	2	8.3	8
Inflatable Boat Use	1	4.2	25
Picnicking	0	0	0
Swimming and Sunning	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
General Recreation	0	0	0
Ponderosa Flat Campground to Alder Creek DUA/Boat Launch			
Picnicking	5	50	20
Biking/Hiking	5	50	20
Bank Fishing	0	0	0
Swimming and Sunning	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0
Alder Creek DUA/Boat Launch to Cool Springs Campground			
General Recreation	7	33	41
Bank Fishing	5	24	8
Picnicking	4	19	16
Biking/Hiking	4	19	16
Swimming and Sunning	1	5	5
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Butt Valley Powerhouse to Ponderosa Flat Campground			
Bank Fishing	26	70	41
Picnicking	4	11	16
Biking/Hiking	4	11	16
Swimming and Sunning	2	5	10
General Recreation	1	3	6
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
Alder Creek DUA/Boat Launch			
Picnicking	9	27	36
Swimming and Sunning	8	24	40
General Recreation	7	21	41
Biking/Hiking	4	12	16
Bank Fishing	3	9	5
PWC Use	1	3	100
Inflatable Boat Use	1	3.	25
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
Cool Springs Campground to Butt Valley Dam			
Swimming and Sunning	9	30	45
Bank Fishing	8	27	13
Biking/Hiking	6	20	24
Picnicking	3	10	12
Inflatable Boat Use	2	7	50
General Recreation	2	7	12
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0

[1] *These percentages reflect the proportion each individual site count comprises in proportion to the total number of people in the study observed doing the activity. Source: EDAW, Inc.*

and sunning (30 percent of site and 45 percent of Project area) followed by bank fishing with eight people (27 percent of site and 13 percent of Project area).

Table E5.2.2-32 displays the activities observed at the seven Belden Reach area sites. Belden Rest Stop (SR 70) had 32 participants in picnicking (65 percent of site and 94 percent of Project area) followed by general recreation with 13 people (27 percent of site and 33 percent of Project area). The dispersed site: Caribou Corners RV Park to Gansner Bar Campground had 13 participants in swimming and sunning (29 percent of site and 38 percent of Project area) followed by biking/hiking with 10 people (22 percent of site and 32 percent of Project area). The dispersed site: Gansner Bar Campground to the Siphon, had 13 participants in bank fishing (35 percent of site and 23 percent of Project area) followed by picnicking with 11 people (30 percent of site and 25 percent of Project area).

As Table E5.2.2-32 displays, the dispersed site: Siphon to North Fork Campground had 10 participants swimming and sunning (36 percent of site and 29 percent of Project) followed by bank fishing with 8 people (29 percent of site and 14 percent of Project). The dispersed site: North Fork Campground to Queen Lily Campground had 5 participants bank fishing (42 percent of site and 9 percent of Project) followed by picnicking with 4 people (33 percent of site and 9 percent of Project).

The dispersed site: Queen Lily to Belden Forebay Dam had 15 participants bank fishing (28 percent of site and 27 percent of Project) followed by picnicking with 14 people (26 percent of site and 32 percent of Project).

Table E5.2.2-32
Belden Reach Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Belden Rest Stop (SR 70)			
Rest Stop Use	32	65	94
General Recreation	13	27	33
Picnicking	2	4	5
Swimming and Sunning	1	2	3
Biking/Hiking	1	2	3
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
Bank Fishing	0	0	0
Gansner Bar Campground to Siphon			
Bank Fishing	13	35	23
Picnicking	11	30	25
General Recreation	6	16	15
Swimming and Sunning	3	8	9
Biking/Hiking	4	11	13
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
North Fork Campground to Queen Lily Campground			
Bank Fishing	5	42	9
Picnicking	4	33	9
General Recreation	3	25	8
Swimming and Sunning	0	0	0
Biking/Hiking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Caribou Corners RV Park to Gansner Bar Campground			
Swimming and Sunning	13	29	38
Biking/Hiking	10	22	32
Picnicking	8	18	18
Bank Fishing	6	13	11
General Recreation	5	11	13
Rest Stop Use	2	4	6
Inflatable Boat Use	1	2	100
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Siphon to North Fork Campground			
Swimming and Sunning	10	36	29
Bank Fishing	8	29	14
Picnicking	5	18	11
Biking/Hiking	3	11	10
General Recreation	2	7	5
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
Queen Lily Campground to Belden Forebay Dam			
Bank Fishing	15	28	27
Picnicking	14	26	32
General Recreation	11	20	28
Biking/Hiking	10	19	32
Swimming and Sunning	4	7	12
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Caribou Powerhouse Gate/NFFT Start			
Bank Fishing	9	60	16
Biking/Hiking	3	20	10
Swimming and Sunning	3	20	9
Picnicking	0	0	0
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable Boat Use	0	0	0
General Recreation	0	0	0

**These percentages reflect the proportion each individual site count comprises in proportion to the total number of people in the study observed doing the activity.*

Source: EDAW, Inc.

As Table E5.2.2-32 displays, Caribou Powerhouse Gate/NFFT Start had nine participants in bank fishing (60 percent of site and 16 percent of Project area) followed by biking/hiking with three people (20 percent of site and 10 percent of Project area).

Table E5.2.2-33 displays the activities observed at the one Seneca Reach area site. As the table displays, Seneca Bridge in the town of Seneca had four participants in general recreation (57 percent of site and 1 percent of Project area) followed by one person bank fishing (14 percent of site and 1 percent of Project area), one person picnicking (14 percent of site and 2 percent of Project area), and 1 person biking/hiking (14 percent of site and 1 percent of Project area).

Table E5.2.2-33
Seneca Reach Area Activity Participation Observations by Site

Activity	No. of Participants	Percent of Activity at Individual Project Sites	Percent Across All Project Sites[1]
Seneca Town Bridge			
General recreation	4	57	1
Bank fishing	1	14	1
Picnicking	1	14	2
Biking/hiking	1	14	1
Rest Stop Use	0	0	0
Equestrian	0	0	0
Windsurfing	0	0	0
Waterskiing	0	0	0
PWC Use	0	0	0
Inflatable boat Use	0	0	0
Swim and sunning	0	0	0

**These percentages reflect the proportion each individual site count comprises in proportion to the total number of people in the study observed doing the activity.*

Source: EDAW, Inc.

E5.2.2.5 Preliminary Monitoring Program

The Draft Recreation Resource Management Plan (RRMP) (see Appendix E5-T) is comprised of several programs, including a Recreation Monitoring Program. This program will describe the Licensee's role in providing periodic monitoring of recreation resources in the Project area over the term of the new license. Part of the program will likely involve the monitoring of recreation use levels as they change over time at some developed facilities and some dispersed recreation sites. This section describes the recreation use data that may be collected and evaluated in the future and a methodology for gathering and examining this information.

The Draft RRMP Monitoring Program utilized the concept of a long-term monitoring framework based on Limits of Acceptable Change (LAC)-type indicators and standards. This process involves: defining the type of visitor experience and sustainable site conditions to be provided, and monitoring site conditions over time to assess whether acceptable conditions have been maintained. Two of the key elements in the LAC process are indicators and standards, which serve to define the desired experience and conditions, and allow for accurate monitoring of conditions over time. Indicators are the specific, measurable variables used to define the experience (e.g., crowding scores). Standards define the minimum acceptable condition for each indicator (e.g., average crowding score of 4 on a scale of 1 to 9). Standards will vary depending on the desired experience level being provided. For example, in a more primitive area, the standard for average crowding scores may be less than 3. In a more developed area, the standard may be 4.0. Key considerations related to indicators and standards are described below.

Indicators:

- Reflect important key issues that should be monitored;
- Specific variables are indicative and realistic of field conditions;
- Allow one to define desired conditions and assess effectiveness of management practices;
- Should be measurable and responsive to possible management actions; and
- Should be easily and economically measurable.

Standards:

- Should be refined based on field conditions prior to full implementation;
- May use a judgmental process;
- Should not be idealistic goals, but conditions that can be achieved over time;
- May be a statement of existing conditions desired or status quo; and
- May be expressed in terms of probabilities (allows for some variability).

In developing the indicators and standards, careful consideration should be given regarding how each indicator will actually be monitored. This helps establish a program that can be effectively implemented over time. If supporting data cannot be collected efficiently and accurately, then the indicator should be modified.

Table E5.2.2-34 provides a list of preliminary monitoring indicators for recreation use levels that were created for developed recreation facilities and dispersed sites in the Project area. These indicators and methods are further defined in the Draft RRMP Monitoring Program (Appendix E5-T). The table also provides a description of how each indicator may be measured/monitored, and a listing of management options for each potential indicator. Management options are provided as examples of what might be considered if standards are exceeded for a given indicator. The management options provided represent a continuum of management actions, ranging from minor, less management-intensive options to major, more management-intensive options.

Table E5.2.2-34
Recreation Monitoring Indicators, Method of Measurement, and Management Options for Developed and Dispersed Recreation Sites

Key Indicators	Method of Measurement	Potential Management Options to Consider
Developed Recreation Facilities		
Day Use Site Capacity Utilization	• Monitor facility use levels during the defined summer season and peak month (July-Aug.) timeframes based on user counts and vehicle counts conducted at selected sample sites during the managed use season (approximately mid-May to mid-September). • Track data for each sample site, but also aggregate across sites to develop an overall average/indicator. • Assess annually if use levels are approaching threshold standards. If not, assess for Form 80 purposes every 6 years.	• Redistribute use by providing visitors with information about alternative sites (I&E Program). • Expand facilities and parking.
Perceived Crowding at Developed Recreation Sites and on the Reservoirs	• Periodically monitor visitor perceptions of crowding using an established 9-point crowding scale to identify the percentage of users that feel crowded. • Focus on selected sample sites and reservoirs (entire or key segments as needed) during the peak use months of July and August. • Indicators to be tracked for each sample site (rather than aggregating across sites). • Assess every 12 years or when larger visitor surveys are conducted.	• Provide adequate buffer between user groups and sites. • Address user conflicts as needed. • Provide additional enforcement. • Increase visitor management controls. • Along with other indicators, consider facility expansion.
Boating Use Levels and Impacts	• Monitor boating use on-water and at selected launch sites during the months of July and August (count boats on-water and boat trailers in parking areas). • Monitor trends in watercraft types, such as PWCs. • Assess annually if use levels are approaching threshold standards. If not, assess for Form 80 purposes every 6 years.	• Provide visitors with information about alternative boat launches (I&E Program). • Expand existing site parking capacity. • Locate new launch capacity in areas where on-water capacity has not been reached.

Key Indicators	Method of Measurement	Potential Management Options to Consider
Campground Capacity Utilization	• Monitor campground utilization by calculating the capacity utilization of selected campgrounds during the managed use season (primarily mid-May to mid-September) and during the peak months (July and August at most sites). • Assess annually if use levels are approaching threshold standards. If not, assess for Form 80 purposes every 6 years.	• Provide visitors with information about alternative sites (I&E Program). • Institute a limited entry system. • Expand the reservation system (partial or full). • Provide incentives for shoulder season use. • Shift smaller groups to new group camps. • Increase campground capacity and develop alternative sites.
Dispersed Undeveloped Recreation Areas		
Site Creep	• Identify and monitor dispersed recreation sites or areas of concern for possible expansion of the area of impact. • Document baseline conditions and monitor for "creep" at sample sites in each area of concern. • Assess every 6 years or as needed in critical areas.	• Erect barriers to better define site boundaries. • Provide additional enforcement. • Harden sites with fire rings, picnic tables, and/or tent pads on a site by site basis. • Limit use to designated dispersed sites (signed). • Site closures and rehabilitation.
Site Pioneering	• Identify and periodically survey dispersed recreation areas of concern and record the number and type of dispersed undeveloped sites. • Compare this information with baseline conditions (first establish a more detailed baseline of site conditions at sample sites). • Evidence of new informal use may include excessive bare ground, accumulated litter, site erosion, new structures, sanitation problems, and/or vegetation damage. • Assess every 6 years or as needed in critical areas.	• Provide visitors with information about location of appropriate dispersed sites (I&E Program). • Limit use to designated dispersed sites (signed). • Provide additional enforcement. • Develop more sites in suitable areas.
Dispersed Site Occupancy	• Monitor a representative sample of dispersed sites occupied during the 2 peak months (July and August). • Conduct counts every 5-10 years, or as needed in more sensitive areas.	• Provide visitors with information about alternative sites (I&E Program). • Develop alternative sites in suitable areas.

Source: EDAW, Inc.

In practice, decisions regarding future management actions would be made at the time that standards are exceeded based on the field conditions, survey, and user count data collected at that time. In all cases, the entire suite of indicators should be reviewed and examined before management actions are taken. Decisions should never be made based on one indicator alone in isolation and 1 year of data. Additionally, management actions pertaining to dispersed undeveloped sites should be considered on a site-by-site basis, as well as overall, in order to safeguard resources at each site and to maintain the desired visitor experience.

Preliminary monitoring standards were developed for each key indicator as shown in Table E5.2.2-35. These standards fall into three types (resource, social, and managerial) and may vary depending upon the recreational opportunity area found in the Project area.

These standards were developed based on existing conditions and judgments regarding acceptable conditions. The specific values shown in the table are related to the method of measurement, as shown in Table E5.2.2-34.

E5.2.2.5.1 Pre-test of Monitoring Program

Monitoring data on indicators may be derived from a combination of field observation, normal data collected by site operators, and longer-term periodic survey efforts. During the first 5-year period of implementation of the Draft RRMP, a pre-test, or pilot program is suggested to fine tune the indicators, standards, and monitoring procedures. Input from

users and resource managers regarding monitoring standards and indicators, as well as acceptable site conditions, should be built into the pre-test.

Once the Draft RRMP Monitoring Program is tested and modified accordingly, it would likely be implemented on both a regular and periodic basis as noted above for site type (developed or dispersed).

Table E5.2.2-35
Recreation Monitoring Indicators and Standards by Recreation Opportunity Area

Key Indicators	Standards by Recreation Opportunity Area		
	Semi-Primitive	Roaded Natural/ Roaded Modified	Rural/Project Facility
Developed Recreation Areas			
RESOURCE:			
No resource issues have been identified that have not been addressed in other relicensing plans	No standards at this time (May develop standards at a later date if necessary)	No standards at this time (May develop standards at a later date if necessary)	No standards at this time (May develop standards at a later date if necessary)
SOCIAL:			
Perceived Crowding at Developed Sites	N/A	Currently not a problem. Based on future survey, average crowding score of 4.0 (Shelby and Heberlein 1986).	Currently not a problem. Based on future survey, average crowding score of 4.7 (Shelby and Heberlein 1986).
MANAGERIAL:			
Campground and Day Use Capacity Utilization	N/A	Satisfy 1 or more of the following: (1) 80% occupancy during peak months (July and August); (2) 60% occupancy during the managed use season when the facility is open from mid-May to mid-September; and (3) 15% of season days at 90% (approximately 20 days). A sustained trend of 3 out of 5 years must be established. Includes both weekdays and weekends to establish occupancy rate percentages.	Satisfy 1 or more of the following: (1) 80% occupancy during peak months (July and August); (2) 60% occupancy during the managed use season when the facility is open from mid-May to mid-September; and (3) 15% of season days at 90% (approximately 20 days). A sustained trend of 3 out of 5 years must be established. Includes both weekdays and weekends to establish occupancy rate percentages.

Key Indicators	Standards by Recreation Opportunity Area		
	Semi-Primitive	Roaded Natural/ Roaded Modified	Rural/Project Facility
Boating Use Levels – Reservoir Surface Water	25 acres/boat reservoir-wide (dependent on primary boating activity)	25 acres/boat reservoir-wide (dependent on primary boating activity)	25 acres/boat reservoir-wide (dependent on primary boating activity)
Dispersed Undeveloped Recreation Areas			
RESOURCE:			
Site Creep	10 percent expansion of area of impact; 5 percent expansion into sensitive habitat	10 percent expansion of area of impact; 5 percent expansion into sensitive habitat	10 percent expansion of area of impact; 5 percent expansion into sensitive habitat
Site Pioneering	10 percent increase in total number of sites	10 percent increase in total number of sites	10 percent increase in total number of sites
Dispersed Undeveloped Recreation Areas (continued)			
SOCIAL:			
None identified at this time.	None required at this time (May develop standards at a later date if necessary)	None required at this time (May develop standards at a later date if necessary)	None required at this time (May develop standards at a later date if necessary)
MANAGERIAL:			
Dispersed Site Utilization	Up to 50 percent season long (summer)	Up to 50 percent season long (summer)	Up to 50 percent season long (summer)

Note: The recreation season is defined as when the facility is open from mid-May through mid-September. Subject to revision based on on-the-ground testing.

N/A = not applicable.

Provided by EDAW, Inc.

E5.2.2.5.2 Preliminary Monitoring Sites

Table E5.2.2-36 provides a list of preliminary monitoring sites by resource area. The Draft RRMP Monitoring Program focuses on these sites and areas.

E5.2.2.5.3 Levels of Monitoring

The Draft RRMP Monitoring Program includes two levels of monitoring. These levels include: ongoing regular monitoring of recreation sites and use areas using readily available monitoring data collected during normal routine management of recreation resources, such as paid fee receipts, camp host counts, observations made when trash is

Table E5.2.2-36
Monitoring Locations by Management Unit and Monitoring Area in the UNFFR Project Area

Management Unit	Monitoring Area	Selected Monitoring Sites/Areas
Lake Almanor (Land)	Eastshore	• Westwood Beach, Stumpy Beach, and New Eastshore Campground/DUA, Eastshore Group Camp (modified), Almanor Scenic Overlook, and Hamilton Branch Fishing Access Site (potential)
	Westshore	• Almanor Campground/Boat Launch/Swim Beach, Lake Almanor Campground/DUA, Canyon Dam Boat Launch/DUA, Canyon Dam DUA, Camp Conery Group Camp, PSEA Beach, and Southwest Shoreline Access Zone (four identified access points)
	Northshore	• North Shore Boat Launch, Chester Shoreline Access (Super Channel and Stover Ranch), and Catfish Beach Primitive DUA/Campsites
	North of Causeway	• Last Chance Campground
	Peninsula to Hamilton Branch	• None at this time (all private sites)
Lake Almanor (Water)	Segment A – North of Causeway	• Water area use by watercraft
	Segment B – West of Peninsula	• Water area use by watercraft
	Segment C – East of Peninsula, north of the Point	• Water area use by watercraft
	Segment D – Southeast of Peninsula, south of Point	• Water area use by watercraft
Butt Valley Reservoir		• Ponderosa Flat Campground
		• Cool Springs Campground
		• Alder Creek DUA/Boat Launch
		• Butt Valley Powerhouse area angler access points
		• Boat-in/walk-in sites (8) on the southwest shoreline
		• Surface water use by watercraft
Belden Forebay		• Belden Forebay Car-top Launch/Trailhead
		• Surface water use by watercraft
Belden Reach		• Belden Rest Stop (Hwy 70)
Seneca Reach		• None at this time

Provided by EDAW, Inc.

collected, vehicle counts, etc.; and more in-depth recreation survey work conducted every 12 years, such as visitor and non-visitor surveys (mail, contact, windshield, etc.). Some monitoring indicators, such as dispersed undeveloped site pioneering and creep, may be monitored more frequently.

The Licensee and others may consider a number of data gathering and analysis techniques as appropriate. The use of camp hosts to perform counts is one example of a method that could be employed to provide frequent counts at selected sites at a low cost. Recreation facility condition could be determined by periodic on-site inspections of each facility or use area. More in-depth visitor surveys could be administered less frequently (approximately every 12 years) in order to further validate peak season capacity utilization data of Project recreation areas, to validate that monitoring indicators have or have not been reached or exceeded, and to identify changing visitor and/or area resident visitor attitudes and perceptions over time.

E5.2.2.5.4 Preliminary Monitoring Management Actions

Based on the available data gathered during yearly and periodic monitoring, potential management actions for each management unit should be considered. Management options may include those listed in Table E5.2.2-34.

Management actions may also include:

- Planning, designing, expanding, renovating, and/or constructing facilities in phases;

- Increasing monitoring efforts as needed, such as collecting more detailed visitor counts at facilities in question; begin planning and designing new facilities or renovation;
- Pursuing or delaying new construction;
- Modifying monitoring indicators if conditions warrant;
- Increasing visitor information in order to redistribute use patterns; and/or
- Considering a full or partial reservation system.

Other management actions may also be considered as appropriate. Further details on the Monitoring Program are defined in the Draft RRMP (Appendix E5-T).

E5.2.2.5.5 Preliminary Reporting Approach

This section describes suggestions for periodic recreation use assessment reports that will be prepared by the Licensee and will document:

- Statistical methods applied in analyzing monitoring data;
- Success of developed recreation visitor management efforts;
- Recreation facility use levels and counts; and
- Trends in recreation facility use.

These reports will be used by Licensee and others to assess visitor trends, assess whether thresholds have been exceeded, assess the success of visitor management control measures, and make future plans. These reports are proposed to coincide with FERC Form 80 recreation reporting requirements, which require that forms on recreation use be submitted to FERC every six years.

E5.2.2.6 Summary of Recreation Use Study Findings

The objective of this study was to estimate existing recreation use at the four resource areas. Day use data were collected for 20 sites at Lake Almanor, six sites at Butt Valley Reservoir, seven sites along Belden Reach, and one site along Seneca Reach. Data measures included PAOT, VAOT, and percentage of parking spaces or picnic tables occupied. Campground occupancy data were obtained from campground hosts for eight campgrounds. Three campgrounds were in the Lake Almanor resource area, two were in the Butt Valley Reservoir resource area, and three were in the Belden Reach resource area. Occupancy data were also obtained from owners of overnight resorts. Recreation days for DUAs were calculated from traffic counter and observational data. Finally, recreational activities were observed and recorded at day use sites in the four resource areas.

At DUAs existing use rarely reached or exceeded capacity. One notable exception was the Canyon Dam Boat Launch/DUA ramp. At this site, the average VAOT was estimated to be 140 percent for single vehicle parking spaces. Most other DUAs were well below capacity. For example, at Lake Almanor, the highest used resource area, the mean VAOT did not exceed 50 percent, even during holiday sampling periods. This same pattern applied to the other three resource areas.

Overnight use was estimated for campgrounds and private resorts. Campground occupancy generally was below capacity, but there were some exceptions in the Butt Valley Reservoir and Belden Reach resource areas. In the former, there were 4 days when Cool Springs Campground exceeded capacity. At Belden Reach, all three

campgrounds for which occupancy was reported exceeded capacity, with Gansner Bar Campground showing the most number of days exceeded (19 days). These three campgrounds have low capacity (12–14 sites) that fill up more quickly than the large capacity campgrounds in the Lake Almanor area.

In contrast, private resorts did not have any days during which occupancy was exceeded. Percent occupancy averages ranged from about 47 percent for Little Norway to almost 97 percent for Big Cove.

Recreation use for the study area were estimated from traffic counter and observational data. Total recreation visitation for DUAs was estimated at 531,787 RDs. Recreation activity participation was observed at all the DUAs mentioned previously. Canyon Dam Boat Launch/DUA, Lake Almanor West DUA, and Almanor Beach reported the highest levels of activity, which is consistent with data on VAOT and PAOT for these areas. For the entire study area, the most frequently observed activity was swimming and sunning, followed by general recreation, and then picnicking. Eleven of the DUAs in the Lake Almanor area had low use levels with 50 or less visitors observed during the entire sampling period. Regarding the other resource areas, a similar trend was observed, with all sites having 50 or less visitors observed.

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E5.2.3 Reservoir Boating Study

E5.2.3.1 Introduction

This section presents the results of the Reservoir Boating Study, one of several recreation studies that were conducted by the Licensee for relicensing. The objective of this study is to describe existing boating use and water surface management on Project reservoirs to assess whether management should be considered. This study makes use of data collected during other studies, including Section E5.2.1—Questionnaire Survey, and Section E5.2.2—Existing Recreation Use.

There are four components to this section:

- Study Area—description of the areas studied;
- Methods—description of data collection;
- Results and Discussion—description of study findings on local boating issues, boating use levels, boating infrastructure, boater's perceptions, and surface water boating capacity; and
- Conclusions—study summary and recommendations.

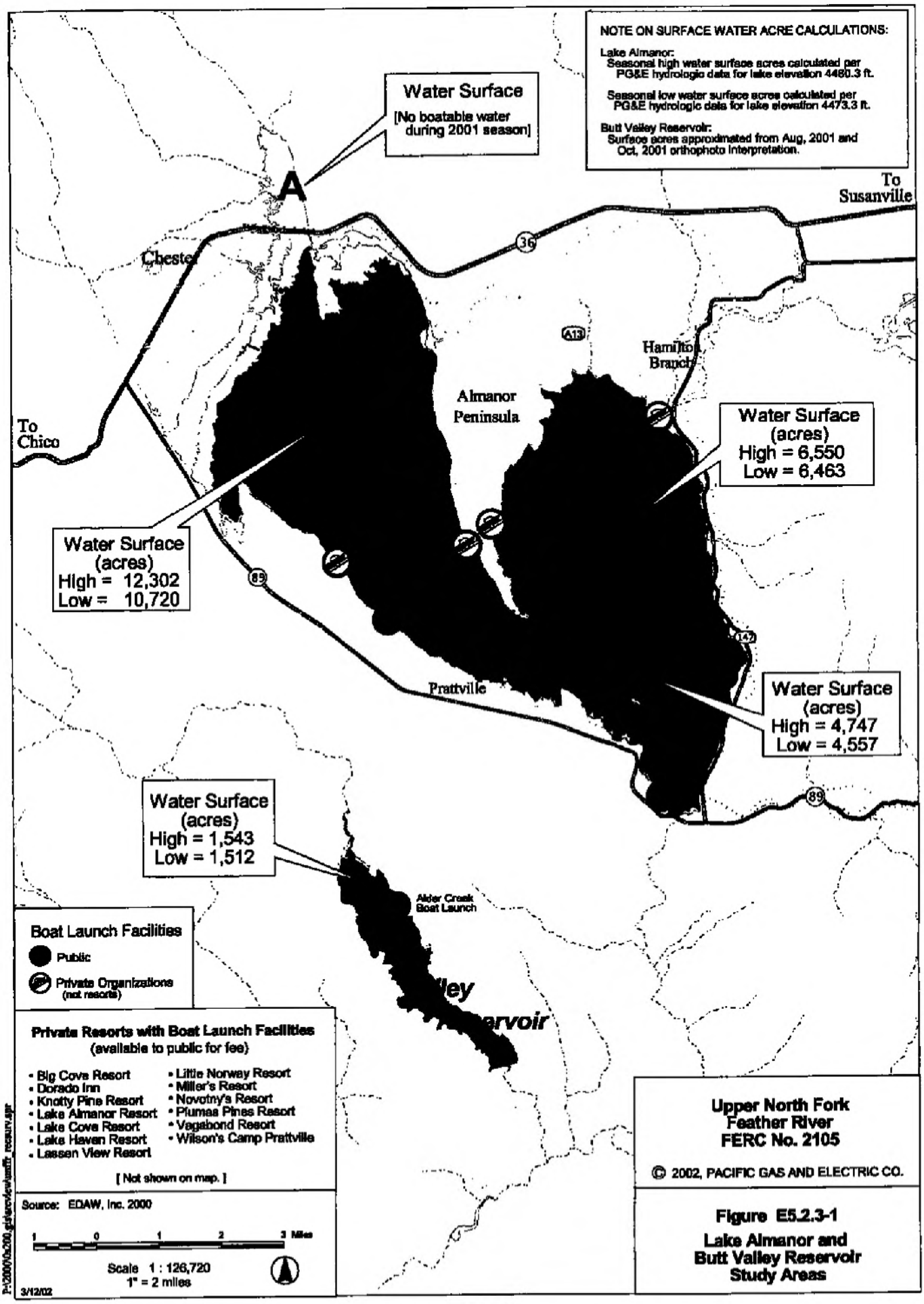
E5.2.3.2 Study Area

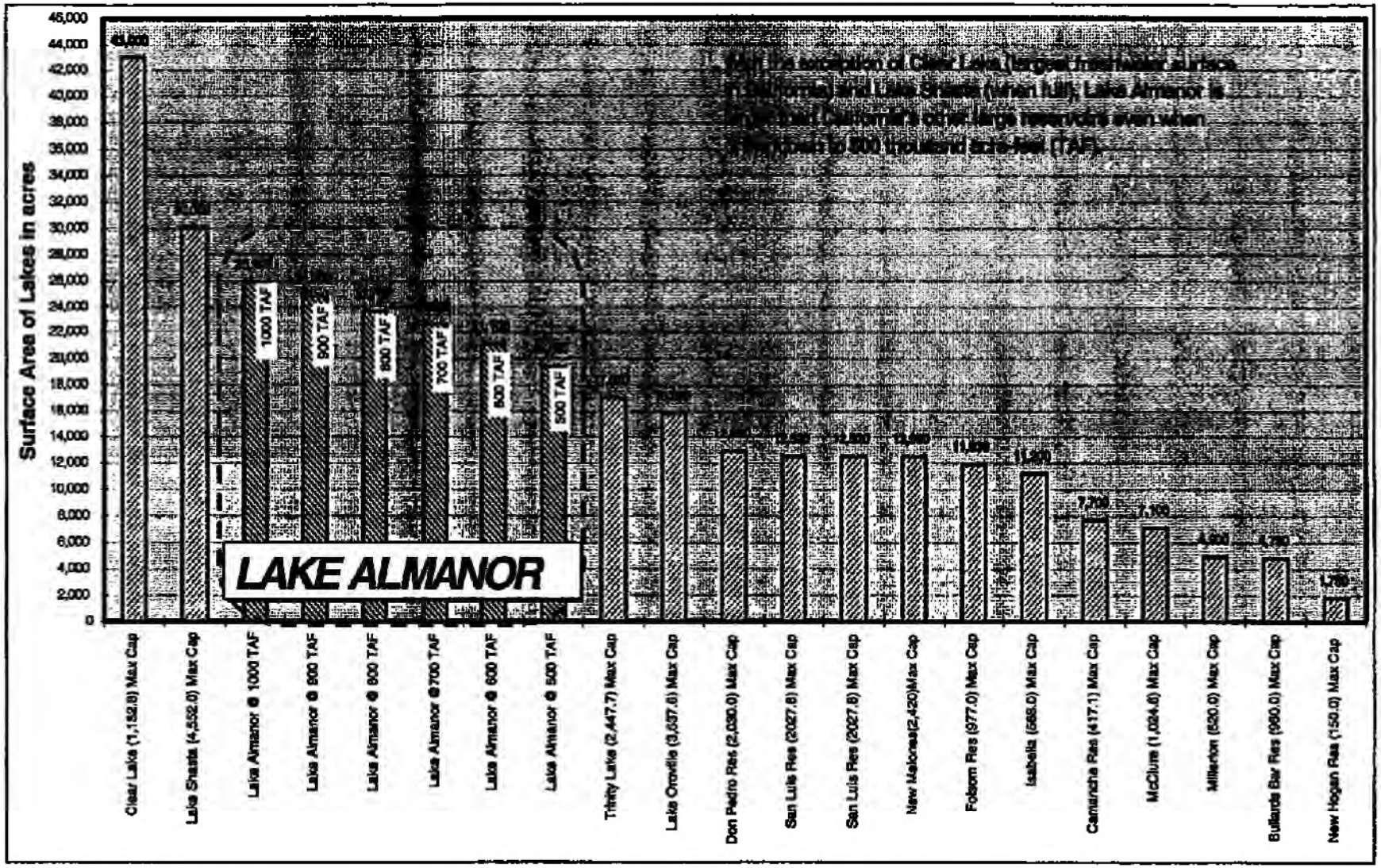
The study area contains two Project reservoirs, Lake Almanor and Butt Valley Reservoir. Because of its larger size, Lake Almanor was divided it into four segments: A, B, C, and D (see Figure E5.2.3-1—Lake Almanor and Butt Valley Reservoir Study Areas). Descriptions of the Lake Almanor segments are provided in the methods section. Because of its much smaller size, Butt Valley Reservoir was not divided into segments.

E5.2.3.2.1 Lake Almanor

Lake Almanor is located in the northeast corner of the Project area at 4,494 feet above sea level (asl) at full pool level (Licensee datum) (Licensee 2000b). When at this level, it offers 27,092 surface acres and approximately 52 miles of recreational shoreline. Even when drawndown as low as 4,467 feet asl, Lake Almanor is one of the largest reservoirs in the state with over 19,000 surface acres (see Figure E5.2.3-2—Surface Area of California Reservoirs Compared with Lake Almanor at Various Stages of Drawdown). Only Lake Shasta (30,000 acres at full pool) and Clear Lake (43,000 acres at full pool) offer more surface acres.

From late May through mid-June of the 2001 recreation season, elevation was about 4,480 feet asl or 14 feet below the full pool level, which corresponds to about 23,600 surface acres, or 13 percent less than full pool. The pool level elevation fell 4 feet, to about 4,477 feet asl by late July and early August, reducing the surface area to about 22,700 acres. By early October, the elevation was about 4,474 feet asl, with an area of about 22,000 surface acres, or 18 percent less than at full pool. The annual low for 2001 was measured on November 9 at 4,471.8 feet asl and 21,179 surface acres. Because of drought conditions, as well as effects of the 2001 California energy crisis, the 2001 season was a lower water year. Under normal water year conditions, the Licensee operates Lake Almanor under the maximum level allowable of 4,494 feet and above the target minimum of 4,467 feet. In addition, during normal water years, the lake is targeted for not less than 4,474 ft elevation prior to September 15.





Source: Licensee 2002

Figure E5.2.3-2
Surface Area of California Reservoirs Compared with Lake Almanor at Various Stages of Drawdown

The Licensee has provided family and large group public camping areas and public picnicking/day use facilities at Lake Almanor, which provide recreational opportunities for fishing, swimming and boating. The area also contains rental cabins and summer homes. Licensee's Lake Alamanor Campground has 130 sites for RVs and tents (Licensee 2000b). Lassen National Forest also manages a public campground on Lake Almanor containing 103 campsites for RVs and tents (Licensee 2000b). Near the campground is a public day use area (DUA) and public boat launch.

The Lassen National Forest (within the Plumas National Forest) also provides a public boat launch near Canyon Dam, coupled with picnic areas, beach access, and an ADA-compliant fishing ramp.

Private entities also provide several boat launches and dock slips. Community, Country Club, and homeowner's associations provide four ramps available to residents only: one at Hamilton Branch on the east shore, two at Lake Almanor Country Club on the central peninsula, and one at Lake Almanor West on the west shore. Some of the resorts and marinas provide ramps available to guests or the general public for a fee, dock slips for seasonal rental or short-term use, and gas docks. They are scattered in various portions of the shoreline with concentrations on the southwestern shore and the northeastern section of the lake.

A considerable number of private homes are located on Lake Almanor, with approximately 1,000 private lots on the shoreline and over 600 permits issued by the Licensee for private docks and moorage buoys.

E5.2.3.2.1.1 Segments of Lake Almanor

Four segments at Lake Almanor were delineated for this study in an effort to provide researchers with greater details and the ability to isolate areas geographically rather than only reservoir-wide (see Figure E5.2.3-1). This was done because Lake Almanor is a large reservoir and it would be difficult to accurately ascertain levels of use at a given time over the whole site. Figure E5.2.3-1 illustrates the boundaries of the reservoir segments as well as the change in reservoir shoreline and surface areas from the highest to lowest levels observed during the boating data collection period. (The seasonal high elevation shown occurred May 26 and the seasonal low shown occurred October 13, 2001.) The four segments of the reservoir are described below.

- **Segment A.** Located in the northern tip of Lake Almanor, Segment A is just east of Chester, and to the north of the state route (SR) 36 causeway. At the 4,494-foot full pool elevation (Licensee 2000b), Segment A would contain approximately 494 surface acres of water. However, during the study period Segment A contained little to no boatable water; therefore, no boating use was observed during the 2001 recreation season in this segment.
- **Segment B.** The western portion of the main body of Lake Almanor comprises Segment B. It was delineated via a line running south off the Almanor Peninsula to Dyer View DUA. At the 4,494-foot elevation (Licensee 2000b), Segment B would contain approximately 13,372 surface acres of water. During the 2001 recreation season, it was estimated that the surface area of Segment B began the season at approximately 12,232 acres, and decreased to approximately 10,720 acres by the season's end (a decrease of 12 percent). Segment B includes shoreline occupied by Lake Almanor

West Community Club, the Prattville shoreline that includes several resorts and Forest Service campground day-use areas, as well as the western shoreline of the Lake Almanor Country Club on the peninsula.

- **Segment C.** Segment C covers the northern portion of the eastern half of the main body of the reservoir. An east–west line running from the tip of the peninsula to the eastern shore separates Segment C from D. At the 4,494-foot elevation (Licensee 2000b), Segment C would contain approximately 6,726 surface acres. Segment C began the season with an estimated 6,612 surface acres, and decreased to 6,463 surface acres by the end of the 2001 recreation season (a decrease of 2 percent). The shoreline of Segment C includes the eastern shore of Lake Almanor Country Club, commercial resorts, and areas of private homes at Hamilton Branch on the eastern shore of Lake Almanor.
- **Segment D.** Segment D is located in the southeast portion of Lake Almanor. As described above, it is separated from Segments B and C by lines running south and east from the tip of the peninsula. At the 4,494-foot elevation (Licensee 2000b), Segment D would contain approximately 4,717 surface acres. During the 2001 recreation season, Segment D began with an estimated 4,720 surface acres and ended the season at 4,557 surface acres (a decrease of 6 percent). Developments along the shoreline of Segment D are all public, including the Licensee's Lake Almanor Campground, and the Forest Service's Canyon Dam Boat Launch/DUA.

E5.2.3.2.2 Butt Valley Reservoir

Butt Valley Reservoir is located approximately 4 miles south of Lake Almanor at an elevation of 4,140 feet asl at full pool level (Licensee datum) (Licensee 2000b). At this level, the reservoir has 1,600 surface acres and a 49,897 acre-feet capacity. The low pool level at Butt Valley Reservoir is approximately 4,135 feet asl. At this lower pool level there is 1,510 surface acres or 90 acres (6 percent) less than at the high pool level.

Opportunities for recreation at Butt Valley Reservoir include camping, fishing, and swimming. Recreation facilities developed by the Licensee include two campgrounds on the east shore: Cool Springs and Ponderosa Flat. Located on the north end of the Reservoir, Ponderosa Flat is a fee campground and contains 63 camp units with an overflow camping area. Cool Springs is also a fee campground containing 25 drive-in and five walk-in camp units. It is located 2.5 miles south of Ponderosa Flat Campground on the east shore. The Licensee also provides a public boat launch and DUA at Alder Creek. Powerboats are allowed on the reservoir; however, posted regulations limit boat speeds to a maximum of 25 miles per hour (mph).

E5.2.3.3 Methods

This section describes the method used to accomplish the tasks set forth in each study component. These include research of local boating issues, assessment of boating use levels and boating infrastructure, assessment of boaters' perceptions, and estimation of surface water boating capacity.

E5.2.3.3.1 Methodology for Researching Local Boating Issues

Local boating issues were documented through researching boating accident statistics, boating law enforcement problems, and boating regulations and management. Boating regulations were summarized by reservoir.

Current and historical accident information and boating regulations were requested from the Plumas County Sheriff's Department Marine Patrol, as well as from the California Department of Boating and Waterways (Cal Boating). Accident history information identified yearly total boating accidents, boating deaths, and boating-related property damage. Other issues of concern to area visitors and residents were solicited, including the effect of water levels on perceptions of safety and recreational enjoyment (see Section E5.2.1—Questionnaire Survey). Additional areas covered by the surveys included perceptions of crowding; recreational conflict; and facility, resource, and social conditions. Finally, survey participants provided evaluations of current recreation facilities and services, as well as their support for potential improvements in facilities and services.

E5.2.3.3.2 Methodology for Assessing Boating Infrastructure

This section presents data on the overall infrastructure that supports boating (marinas, boat launches, gas docks, commercial docks, sanitary pump outs, etc.). Facility conditions are also summarized in this section. Data for this assessment was also collected as part of the Recreation Facility and Condition Inventory (see Section E5.1.2). Infrastructure deficiencies are noted and summarized.

The existing level of boating infrastructure and services was compared with boating facility guidelines (National Water Safety Congress (NWSC), National Recreation and Parks Association (NRPA), etc.) to determine if there were any deficiencies based on guidelines. How reservoir pool levels may affect public access to recreation facilities and to the reservoirs was assessed. Related potential affects on boating infrastructure were also assessed and documented. For public boat launch sites (Licensee and Forest Service only), an assessment of each ramp's effectiveness at high and low pool was conducted in 2002.

An effective bottom elevation for the toe of each ramp lane was identified when possible. A standard of a minimum 3 feet of water at the ramp toe is commonly used to assess effectiveness and accessibility at boat launches. Typical periods of time when this standard is not being met are described for each reservoir.

Further comparison was made with visitation trends (peak summer and holiday use) and the availability of other public ramps to meet seasonal and year-round boater access needs (at least one ramp available year-round per reservoir if feasible). Other potential issues related to floating docks, gangways, fuel docks, piers, marinas, and other facilities were discussed with Licensee and Forest Service facility operators.

E5.2.3.3.3 Methodology for Assessing Boating Use Levels

Existing boating use levels were assessed for Lake Almanor by means of observations (i.e., counts) conducted from a boat. The type of each watercraft observed was also

recorded (powerboats, personal watercraft (PWC), sailboats, kayak/canoe, and float-tube). The activities boats were engaged in were recorded when possible, including cruising, waterskiing, angling (from a boat), and windsurfing. Existing use level information was summarized as boats-at-one-time (BAOT) on the water surface and boat traffic density. Simultaneously, the number of inactive boats at dock slips, mooring buoys and balls, and beached on shore were observed and recorded, as was shoreline recreational use at dispersed sites.

Boating use level data for Butt Valley Reservoir is more limited and comes from observations of boats on the water conducted from the roads that closely parallel the shoreline. Unlike Lake Almanor, the reservoir does not contain docks or mooring buoys. Boaters launch from the single public boat launch at Alder Creek, or from the shoreline at the campgrounds (non-powerboats only).

Information documenting parking lot utilization at boat launches during morning, afternoon, and evening periods during weekday, weekend, and holiday periods was also collected. Data for these estimates is included in Section E5.2.2—Existing Recreation Use Study. This information was summarized as vehicles and boat trailers-at-one-time.

Use estimates were made for boating-related use during four periods as shown in Table E5.2.3-1.

Fourteen observations/counts were conducted on the reservoirs between May 12 and October 13, 2001. Six of these counts were during the peak season (between Memorial Day and Labor Day), and three were peak season-holiday (Memorial Day, Independence Day, and Labor Day) counts. Five were non-peak season counts (before Memorial Day Weekend and after Labor Day Weekend).

Table E5.2.3-1
Sampling Frequency for 2001 Boating Use Study

Season	Dates	No. of Sampling Dates
Non-peak—early	Prior to Memorial Day Weekend	2
Holiday	Memorial Day Weekend Independence Day Labor Day Weekend	3
Peak	Between holiday weekends from Memorial Day Weekend until Labor Day Weekend	6
Non-peak—late	After Labor Day Weekend	3
Total		**14**

Source: EDAW, Inc.

All observations were conducted on weekend days (all but one on a Saturday), with the exception of the Independence Day count (Wednesday). The observations typically took 1–2 hours to complete. Most were conducted between 1:00 and 3:00 p.m.; a few began as early as 11:00 a.m. and were concluded as late as 4:30 p.m.

Survey items relating to boating use and boating infrastructure use are included as part of Section E5.2.1—Questionnaire Survey.

Information from both visitors and area residents is included in this section as it relates to visitors' primary lake used for boating, ownership of watercraft, types of boats used, moorage/storage patterns, use of boat launches, and boat launch waiting times. In addition, area residents whose household boating use is based from a shoreline dock on Lake Almanor supplied information about the frequency of launches from their private docks. (Information was requested for four seasons: spring (April and May), summer (Memorial Day to Labor Day), fall (after Labor Day through October), and winter (November through March).

E5.2.3.3.4 Methodology for Assessing Boaters' Perceptions

Boaters' attitudes and opinions about the Project's reservoirs and about other boaters were assessed. Perceptions assessed and summarized included water surface crowding, user conflicts, resource conditions, boating regulations, launching and docking facilities, pool levels, and potential management and facility improvements. Boater group characteristics were also summarized, including group size, primary boating activities, and lengths of stays. Data for these summaries were collected as part of the Questionnaire Survey (see Section E5.2.1).

E5.2.3.3.5 Methodology for Estimating Surface Water Boating Capacity

Surface water boating carrying capacity was estimated for Lake Almanor (and its four segments) and Butt Valley Reservoir based on factors such as water depth, boaters' perceptions of crowding and conflicts, and boating standards.

This capacity analysis was conducted in conjunction with analysis found in Section E5.2.5—Recreation Carrying Capacity Analysis. This analysis focused on surface water area for boating use. Four types of capacity were considered: ecological, facility, physical/spatial, and social.

For each reservoir (and the four segments of Lake Almanor), conclusions were made regarding which of the four capacity types is a limiting factor(s). Qualitative and quantitative data were used to make these conclusions. A limiting factor is defined as an indicator that limits or puts a cap on the level of recreational use (capacity) at a site or area. For example, the number of boat launches and associated parking available (facility capacity) potentially limits boating if all the ramps are busy. If boating activity has no space to expand or is constrained by shallows, physical capacity is a second indicator to consider. If a boating area is located next to sensitive wildlife or vegetation resources, these resources may be considered an ecologically-limiting factor. Finally, if a body of water or segment is perceived as extremely crowded or there are user conflicts, social capacity may be a limiting factor no matter what the use level is. NRPA and other boating density guidelines were considered in this assessment.

These boating capacity density standards are subject to variation based on reservoir-specific factors such as water depth, shoreline configuration, visitors' perceptions, number of accidents involving other boats, boat type and speed, dominant boating activities, and the types of activities that are popular on the water and on the shoreline.

Once identified, these limiting factors became the focus for assessing recreation capacity at a reservoir or reservoir segment, or monitoring boating capacity in the future. While all four capacity types being considered (ecological, facility, physical/spatial, and social) were potentially limiting factor(s), typically only a few factors dominated.

Based on this process, an overall assessment of reservoir and reservoir segment boating capacity was developed. This assessment characterized boating use levels in relation to capacity using four general conditions: below, approaching, at, or exceeding capacity. Two key timeframes were considered: typical weekend afternoons and holiday weekend afternoons from Memorial Day to Labor Day Weekends.

For reservoir segments, overall capacity was assessed based on a review of each capacity types. Ecological concerns were addressed by reviewing the percentage of shoreline vegetation made up of sensitive riparian/wetland vegetation (using threatened and endangered species (TES) GIS mapping) for each segment, as well as other ecological variables.

The physical/spatial capacity of reservoir segments was assessed using data on the number of boats counted and surface water acres in each segment. (Dividing boats counted by surface acres produces an acres-per-boat boat traffic density figure.) These numbers were then compared with a theoretical average number of surface water acres needed per boat. Various boating density standards stating the surface water acreage needed by boaters have been developed and used over the years.

These standards range from as few as four to as many as 40 surface water acres per boat, with the larger acreage standards used for space-dependent activities such as waterskiing and PWC use within narrow areas.

A theoretical boating capacity standard of 25 surface water acres needed per boat appears reasonable for the Lake Almanor area and is consistent with several other standards used for reservoirs of this size, configuration, and use. A slightly lower density standard of 20 acres per boat would be reasonable for Butt Valley Reservoir, taking into account slower boat speeds and less diversity in use (e.g., no high speed cruising, waterskiers or PWC).

Social capacity by reservoir segment was addressed by boaters' responses to crowding questions included in Section E5.2.1—Questionnaire Survey, as well as user conflict reports by reservoir segment. Facility capacity by reservoir segment is addressed by reviewing facility utilization levels at boater facilities located in each segment.

E5.2.3.4 Results and Discussion

The following sections contain an integration of findings from the 2001 season recreation studies as they apply to the boating use of Lake Almanor and Butt Valley Reservoir, including data from both the observational boating study as well as the recreation user surveys. Results detail findings from research on local boating issues, Project boating infrastructure, boating use characteristics, boaters' perceptions, and the boating carrying capacity of Project reservoirs.

E5.2.3.4.1 Local Boating Issues

Results in this section focus on boating issues in the Lake Almanor and Butt Valley Reservoir study area that relate to boating accident statistics, law enforcement problems associated with boating, and also includes a summary of boating regulations and a discussion of management issues.

E5.2.3.4.1.1 Accident Statistics

Accident statistics for Lake Almanor were provided by Cal Boating (2001). Statistics related to accidents, injuries, deaths, and property damage were available for the years 1990 through 2001 for Lake Almanor. Cal Boating indicated that there were no reported accidents for Butt Valley Reservoir. The findings are summarized in Table E5.2.3-2.

Table E5.2.3-2
1990–2001 Lake Almanor Accident Statistics

Year	Accidents	Injuries	Deaths	Property Damage ($)
1990	3	2	0	7,900
1991	5	1	2	7,000
1992	0	0	0	0
1993	7	8	2	9,400
1994	6	3	0	10,100
1995	4	2	0	0
1996	2	1	0	5,000
1997	4	8	0	2,000
1998	2	0	0	5,000
1999	1	0	0	4,000
2000	3	3	0	0
2001	1	0	0	Not Available
Total	**38**	**28**	**4**	**50,400**

Source: Cal Boating 2001

Accidents were spread fairly evenly over the 12-year period from 1990 to 2001, although the three highest figures were reported for years prior to 1995. The highest number of accidents occurred in 1993 with seven. During this period, a total of 38 accidents were recorded, resulting in 28 individual injuries and four deaths. There were no deaths reported during 9 of the 11 years. The cumulative property damage during the 10-year period totaled $50,400, and reported damaged ranged from none to about $10,000. Information regarding the single accident in 2001 was not available at the time of this study.

E5.2.3.4.1.2 Law Enforcement Issues

Information related to law enforcement/marine patrol was requested in 2001 and 2002 but not available from the Plumas County Sheriff's Department.

E5.2.3.4.1.3 Boating Regulations and Management

The Plumas County Code specifies regulations governing Lake Almanor and Butt Valley Reservoir in Title 10—Parks and Recreation. Section 10-1.03b indicates that Lake Almanor and Butt Valley Reservoir fall under the category of lakes, including reservoirs, containing more than 35 acres. Relevant sections of the code have been provided in their entirety in Appendix E5-U—Plumas County Boating Regulations.

Butt Valley Reservoir has a posted speed limit of 25 mph, and restrictions against waterskiing and PWC use. Boating at Project reservoirs is primarily regulated through protective space zoning.

Boats must not exceed 5 nautical mph when within 200 feet of shore, any boat landing area, any swimming float, diving platform, lifeline, or site where boats are secured and/or where passengers load and unload. No boats are permitted to exceed 5 nautical mph when within 100 feet of any person who is bathing or swimming. The 5 mph limit also applies to boats within 300 feet of the boundaries or limits of any fish spawning area marked and designated as such by the California Department of Fish and Game (DFG) or by the Forest Service. Speed limits are also applicable to evening hours, and boats are not to exceed the 5 mph limit between 30 minutes after sunset and 30 minutes before sunrise of the following day. These hours are also the period of time when boats are required to display appropriate running lights. Additional regulations restrict waterskiing activities to an area outside of 50 feet of existing swimming areas. Swimming is not permitted in boat launch areas. Overnight stays on boats are also not permitted.

Management issues were explored extensively as part of the visitor recreation surveys (see Section E5.2.1) conducted at Project recreation sites and as part of the local resident and business surveys. Many of these issues are related to reservoir boating and are addressed in the following sections of this report. Issues include visitor and area resident perspectives on reservoir level effects on recreation enjoyment and safety; the extent of crowding; and crowding conflict, and resource problems. Visitor evaluations of the levels of recreational development and services at the two reservoirs are also discussed.

In summarizing survey respondents' opinions on management issues, no effort was made to select out only data obtained from boaters (i.e., those who indicated they boat on Lake Almanor or Butt Valley Reservoir). However, 75 percent of those contacted at Lake Almanor and 77 percent contacted at Butt Valley Reservoir were boaters. Also, non-boating survey respondents who did not want to answer a question that they perceived to be relevant only to boaters were able to respond "not applicable."

Focus group interviews with recreation interest groups in Chester also yielded a number of managerial concerns, focusing on reservoir levels and safety. One group interviewed was comprised of a boating interest group, and reservoir level effects on boating safety was of primary concern to this group. The existence of the three main islands in the reservoir, and an increase in the number of hazard logs or "deadheads" were particular concerns expressed by interview participants. One participant suggested publishing the location of known hazards on a map as a way of increasing safety on Lake Almanor. Another area of discussion involved placing warning markers on known hazards in the reservoir, such as the islands. One participant suggested that a placement of a light on the tip of the peninsula where Lake Almanor Country Club is located, and one on Goose Island (the most prominent island) would greatly aid navigation in the dark, particularly during search and rescue operations.

E5.2.3.4.2 Assessment of Boating Infrastructure

E5.2.3.4.2.1 Guidelines for Public Boating Facilities

Two guideline publications were used in a review of Project boating-related facilities. *Park Planning Guidelines* developed for NRPA contained information related to boating facility guidelines (Fogg 1990). Additionally, the *Guide for the Safe Operation and Maintenance of Marinas* was utilized (NWSC 2001). Suggested guidelines contained in these two documents have been provided in Table E5.2.3-3, along with an indication of boating facility status compared to these guidelines.

Table E5.2.3-3
NRPA and NWSC Boating Facility Guidelines and Project Compliance

Guideline	Project Compliance
Access to boat launching facilities should be located so as to keep cars with boat trailers away from picnic areas.	Satisfactory
Boat launching access should be one of the first areas to be reached in a multi-use area.	Compliant at all sites except Alder Creek, where it was determined to not be a problem
Adequate parking capacity is to be provided. Also provide a minimum of 10 percent of spaces for car-only parking.	Parking can be a problem during peak periods
Provide picnic facilities near boat launches for family members who do not boat at a rate of one table per 10 parking spaces.	Satisfactory
A rigging and de-rigging lane is needed to prevent boat congestion.	Satisfactory
Ramp slopes: minimum 7 percent, desirable 13–14.5 percent, maximum, 15 percent, and 15–20 percent below the waterline.	Satisfactory at Lake Almanor. Alder Creek ramp grade does not meet this guideline for desirable ramp grade
Ramp toe to have a minimum of 3–4 feet of water.	Satisfactory at 3 feet for Canyon Dam and Alder Creek DUA/Boat Launches during the recreation season (non-drought conditions)
Ramp widths should be 12–15 feet.	Satisfactory
Parking should be 40 to 60 vehicle-with-trailer spaces for each lane, depending upon boating type, plus additional 10 percent for single vehicle parking.	Parking is limited
Provide a courtesy dock at a rate of 1 dock per 2 lanes.	Satisfactory
Toilets to be no more than 300 feet from the ramp. One toilet per gender per 150 vehicles.	Satisfactory

Guideline	Project Compliance
Provide gas service and food service for lakes serving over 300 boats.	Satisfactory N/A at Alder Creek
Provide areas for car-top boat launching with gentle slopes.	Satisfactory
Provide adequate wind protection, particularly if there is sailboating.	Wind can be a problem N/A at Alder Creek
Provide adequate information signs.	Satisfactory
Marinas—provide one facility for each 300 boats with docks and gas.	Satisfactory
Each ramp to have a minimum of one 75-foot diameter vehicle turnaround.	Satisfactory
Ramps to be scored or patterned for traction.	Satisfactory
Keep clear of water vegetation and wood debris.	Satisfactory
Provide safety signs.	Satisfactory

Sources: Fogg 1990; NWSC 2001

E5.2.3.4.2.2 Developed Recreational Boating Facilities—Lake Almanor

Public Boat Launches

There are two public developed boat launches at Lake Almanor: Almanor Boat Launch and Canyon Dam Boat Launch/DUA. Both of these sites are operated by the Forest Service. Each of these boat launches has a concrete boat ramp and raised walkway, and a wooden courtesy dock. The number of ramp lanes provided at these sites is provided in Table E5.2.3-4. Photos and maps of these sites are provided in Appendices E5-A and E5-B (see also Section E5.1.2).

Table E5.2.3-4
Licensee and Forest Service Boat Launch Facilities

Area	Boat Launch Lanes
Lake Almanor	
Almanor Boat Launch	2
Canyon Dam Boat Launch/DUA	3
Butt Valley Reservoir	
Alder Creek DUA/Boat Launch	1

Source: EDAW, Inc.

Almanor Boat Launch. The Forest Service-managed Almanor Boat Launch is located on the west shore of Lake Almanor just off SR 89 adjacent to Almanor Campground (North). This facility is one of two public, no-fee developed boat launches at the reservoir.

Built in 1976, the facility offers opportunities for boating and fishing access. The primary facility at this site is the boat launch, which has two steep, concrete ramp lanes and a wooden courtesy dock. Other facilities at the site include a large, paved parking area with 53 vehicle trailer spaces, a flush restroom near the boat ramp, and a single vault toilet and accessible picnic table on the access road leading to the boat launch. Cal Boating approved a grant to the Forest Service to reconstruct this boat launch facility. Reconstruction, set to begin in the late summer of 2003, will include resurfacing of the boat ramp, replacement of existing courtesy docks, repairing and repaving the parking areas, widening and repaving the access road, construction of two accessible restrooms, improvements to the sewer system, and new signage.

The toe of the boat launch ramp at Almanor Boat Launch is 4,478 ft asl based on surveys conducted by the Licensee in 2002. The toe is generally submerged during the recreation season. However, during August and September 2001, the ramp was not usable due to the lower pool level. The reservoir is usually not accessed via this site between December 1 and April 1 due to accumulated snow and road closures (Forest Service 2001a).

Canyon Dam Boat Launch/DUA. The Forest Service-managed Canyon Dam Boat Launch/DUA is located off SR 89 on the south end of Lake Almanor less than 1 mile from Lake Almanor Dam. Primary activities at this site include boating and fishing access. Boating-related facilities at this site include a boat launch, which has three steep, concrete ramp lanes and a wooden courtesy dock. Other day use recreation elements at this facility include a small picnic area with picnic tables and cooking grills, two toilets and one flush restroom, and a large, paved parking area (with 13 single vehicle spaces and 51 vehicle trailer spaces). There is also an adjacent cove that is a good fishing area. A paved, accessible fishing access ramp was recently constructed at this location.

The elevation of the toe of the ramp at Canyon Dam Boat Launch/DUA is 4,475 ft asl based on surveys conducted by the Licensee in 2002. The toe is normally submerged during the recreation season. This ramp is longer than the Almanor Boat Launch and was usable in August 2001 when the other ramp was not. The Canyon Dam Boat Launch/DUA is open year round but was not usable from late September through March 2002 due to low water levels. During winter months, the Forest Service contracts with the Plumas County Road Department to plow the access road to the boat ramp to allow continued angler/boat access to Lake Almanor.

Based on this evaluation, most of the recreation elements at the Canyon Dam Boat Launch/DUA are in good condition, with some exceptions. The boat ramp and associated wooden dock are in need of repair. In addition, the picnic tables and cooking grills are in need of maintenance, and the older vault toilets need replacement.

The Forest Service has submitted a grant application to Cal Boating for improvements at this boat launch facility. Approval of this grant application is expected in 2002 with construction to follow in the next few years.

Planned improvements include replacement of an old vault toilet with an accessible vault toilet for seasonal use when the restroom is closed, replacement of the courtesy dock, replacement and installation of traffic and interpretive signage, and installation of a potable water system. In addition, there are plans to extend a new ramp leading to the new accessible fishing access station to provide accessible fishing access during periods of low pool levels. Completion of this extension is planned for the fall of 2002.

Commercial and Private Recreation Facilities

In addition to recreation opportunities provided by the Licensee and the Forest Service, numerous commercial boating facilities are located at Lake Almanor. There are also several small communities and residential areas along the shoreline of Lake Almanor with private boating facilities. An inventory of privately-owned and -operated boating facilities at Lake Almanor is provided in detail in Section E5.1.2—Recreation Facility Condition and Condition Inventory. That review was not intended to provide a detailed facility and condition inventory for all recreation elements at each and/or private recreation facility.

Commercial recreation facilities play an important role in providing recreation opportunities at Lake Almanor and satisfy a large portion of the recreation demand in the

Project area. For example, commercial recreation providers supply the majority of boating facilities at Lake Almanor.

There are approximately 16, single-lane commercial boat launches (as compared to two dual-lane public boat launches) and over 20 private marinas with a total of nearly 900 boat slips. A list of the 16 commercial facilities with boat ramps open for public use has been provided below, and is a combination of information from Table E5.1.2-4—Recreation Facility and Condition Inventory, Figure E5.1-3—Existing Recreational Opportunities and Facilities, and recreation visitors and residential users questionnaire survey responses.

- Dorado Inn
- Lake Almanor Resort
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Miller's Resort
- North Shore Campground
- Plumas Pines Resort
- Big Cove Resort
- Knotty Pine Resort
- Moonspinners Resort
- High Sierra Resort
- Novotny's
- Almanor Lakeside Resort
- Vagabond Resort
- Lake Cove Resort

Some of these commercial ramps provide access to lower reservoir elevations, since they were constructed prior to the Licensee raising the reservoir to the 4,494 foot elevation (Licensee 2000b). A general characterization of the private recreational boating facilities

and opportunities is outlined below; however, these facilities are generally not open to the public.

- Lake Almanor Country Club on the peninsula: two paved boat launches; parking for approximately 20 vehicles with trailers each.
- Lake Almanor West Community Club: one boat launch; parking area for approximately 10 vehicles.
- Hamilton Branch Homeowner's Association: one boat launch; parking area for approximately five vehicles.

E5.2.3.4.2.3 Developed Recreational Boating Facilities—Butt Valley Reservoir

The Licensee operates the Alder Creek DUA/Boat Launch at the reservoir, one of three developed recreation facilities in the Butt Valley Reservoir portion of the study area. The other two facilities are campgrounds without boating facilities, also operated by the Licensee.

Alder Creek DUA/Boat Launch is located along the east shore of Butt Valley Reservoir on Prattville–Butt Reservoir Road (county road (CR) 305), approximately 1 mile south of Ponderosa Flat Campground. This facility provides three picnic sites, a vault toilet, cooking grills, a single-lane concrete boat ramp, and a paved parking area. There is no courtesy dock at this site. The facility is usually open from May 15 through October 15, weather permitting. Currently, the Licensee does not charge a day use fee or a launch fee for motorized watercraft and sailboats at this site. PWC use and waterskiing are not allowed on Butt Valley Reservoir due to a speed restriction, and a sign is posted stating

this regulation. Activities include picnicking, boating, and fishing. Based on the inventory and evaluation provided in Section E5.1.2, most of the facilities at Alder Creek DUA/Boat Launch are in good condition. One deficiency is the slope of the boat ramp, which is not steep enough to provide adequate launching with a standard passenger vehicle.

E5.2.3.4.2.4 Minimum Lake Elevations for Use of Public Boat Launches

As part of the assessment of boating infrastructure, the elevation of the toe of each boat launch was determined. A minimum standard of 3 feet of water at the toe of a ramp is commonly used to assess the effectiveness in providing adequate boat launching access. Table E5.2.3-5 provides ramp toe elevations for Project public and private boat launch facilities. A specific discussion of Lake Almanor and Butt Valley Reservoir facilities follows. Periods of time when this standard is and is not met are considered in the section below.

Lake Almanor Launch Facilities

The ramp toe of Almanor Boat Launch has been estimated to be at the 4,478-foot level. Therefore, this ramp is usable to a reservoir elevation down to 4,481 feet.

There are three ramps at Canyon Dam Boat Launch/DUA. The south lane has a toe elevation at 4,475 feet and is useable to a reservoir elevation of 4,478 feet. The north lanes of the boat launch has a toe elevation of 4,475 feet and is also useable down to a lake level of 4,478 feet.

Table E5.2.3-5
Ramp Toe Elevations of Project Public and Private Boat Launch Facilities

Launch Facility	Estimated Elevation of Ramp Toe (feet)[1]	Reservoir Elevation with 3 Feet of Water at Toe of Ramp (feet)
Lake Almanor—Public		
Almanor Boat Launch	4,478	4,481
Canyon Dam Boat Launch/DUA—South Lane	4,475	4,478
Canyon Dam Boat Launch/DUA—North Lanes	4,475	4,478
Lake Almanor—Private		
Plumas Pines Resort	4,459	4,462
South Jetty Ramp in Prattville	4,478	4,481
Lake Almanor West	4,474	4,477
North Shore Campground	4,479	4,482
LACC Recreation Area 2	4,472	4,475
LACC Recreation Area 1—Ramp 1	4,473	4,476
LACC Recreation Area 1—Ramp 2	4,476	4,479
LACC Recreation Area 1—Ramp 3[2]	4,462	4,465
Big Cove Resort—Ramp 1	4,475	4,478
Big Cove Resort—Ramp 2	4,474	4,477
Little Norway Resort	4,477	4,480
Knotty Pine Resort	4,476	4,479
Country Club Resort	4,481	4,484
Moonspinners Resort	4,480	4,483
High Sierra Resort	4,485	4,488
Novotny's	4,478	4,481
Almanor Lakeside Resort	4,477	4,480
Lake Almanor Resort	4,476	4,479
Hamilton Branch H.A.	4,478	4,481
Lassen View Resort	4,480	4,483
Vagabond Resort	4,476	4,479
Lake Haven Resort	4,471	4,474
Dorado Inn	4,479	4,482
Miller's Resort	4,476	4,479
Lake Cove Resort	4,480	4,483
Butt Valley Reservoir—Public		
Alder Creek DUA/Boat Launch	4,109	4,112

[1] All ramps were surveyed on June 11, 2002. Lake surface elevation at time of survey was 4,487.6 feet. Source: Sea Surveyor, Inc.

[2] LACC Recreation Area 1 Ramp 3 is generally submerged and only usable at lower pool elevations, as the top of the ramp is at 4,476 ft.

These ramps are the lowest public boat ramps at Lake Almanor, so once reservoir levels have dropped below 4,478 there are no functional public ramps offering public access at the level recommended by boat ramp operational guidelines. Reservoir levels in Lake Almanor dropped to below 4,478 at the end of July 2001, so between one-third and one-half of the days during the recreation season during 2002 had reservoir levels resulting in ramp toe depths below the guidelines suggested by Fogg (1990) and NWSC (2001).

Licensee's historic reservoir level data for the years 1963 to 1999 indicate that for 28 of the 37 years (75 percent), water levels have been above the 4,478-foot level during the entire season. During 2 years (1976 and 1977) water levels were below the 4,478-foot level for the entire season. During the 7 remaining years, the amount of time that reservoir levels dropped below the 4,478-foot threshold averaged about half of the recreation season and ranged from 25 to 85 percent.

Alder Creek DUA/Boat Launch

The ramp toe of the Alder Creek DUA/Boat Launch is estimated to be at the 4,109-foot elevation. At least a 4,112-foot reservoir elevation would need to be maintained in Butt Valley Reservoir for this ramp to have the standard 3 feet of water as a minimum useable level. The average low pool elevation at Butt Valley Reservoir is approximately 4,135 ft. The limiting factor at this site is related to seasonal road closures due to snow, rather than reservoir level. Despite having little fluctuation in reservoir pool level, boat launch access to this site is prevented by accumulated snow and road closures. As a result, this boat launch is not usable year-round but is accessible during the recreation season.

E5.2.3.4.3 Assessment of Boating Use Levels

This section describes existing boating use levels on the two reservoirs and four segments of Lake Almanor including watercraft numbers and types, ands boating-related activities (waterskiing, fishing, etc.). Use levels were estimated using observational data collected between May and October 2001.

E5.2.3.4.3.1 Boating Use Level Estimation

Lake Almanor Reservoir-Wide BAOT

The number of boats observed on the water varied by season. As many as 87 active boats were observed during off-peak counts in May, while no more than 38 were counted during the three counts that occurred in late September and early October (see Table E5.2.3-6). Peak season boat use was two to three times as high as non-peak, with from 104 to 153 boats counted during the six peak season counts, and an average of about 140 boats observed. Boat traffic was higher still during the holidays with 112 counted during the Memorial Day Weekend count and 183 counted on both Independence Day and Labor Day, the maximum active use level observed.

All active boats observed on Lake Almanor were identified as a powerboat, sailboat, PWC, kayak/canoe/inflatable, or float-tube.

Powerboats comprised about 90 percent of boats during the off-peak counts, but 70–75 percent of boats during the peak season and 58–73 percent during holiday counts. Most of the remaining boats were PWC, which were few in number during the colder non-peak counts but comprised over 20 percent of watercraft observed during the warmer peak

season and holiday counts. Paddle-powered craft such as canoes and kayaks were a minor component of boating use at most times, although a high of 19 craft were observed during the Independence Day count, when they comprised over 10 percent of use.

Table E5.2.3-6
Lake Almanor BAOT Summary by Season and Boat Type

Season	Date	Boat Type					Total
		Power-boat	PWC	Canoe/ Kayak	Sailboat	Float-Tube	
Non-Peak Season	May 12	60	2	2	0	1	65
	May 19	78	4	4	1	0	87
	Sept 29	38	0	0	0	0	38
	Oct 6	33	1	1	0	0	35
	Oct 13	30	0	4	0	5	39
Average: Non-peak Season		**47.8**	**1.4**	**2.2**	**0.2**	**1.2**	**52.8**
Peak Season	June 16	78	25	1	0	0	104
	June 23	105	29	3	2	0	139
	July 28	104	30	5	0	0	139
	Aug 12	109	31	7	2	0	149
	Aug 18	109	27	8	2	0	146
	Aug 25	105	37	9	3	2	155
Average: Peak Season		**101.7**	**29.8**	**5.5**	**1.5**	**0.3**	**138.7**
Peak Season Holiday	May 26	72	31	7	1	1	112
	July 4	105	46	19	10	3	183
	Sept 1	132	35	12	2	2	183
Average: Peak Season Holiday		**103**	**37.3**	**12.7**	**4.3**	**2**	**159.3**
Average: All Counts		**82.7**	**21.3**	**5.8**	**1.6**	**1**	**112.4**

Source: EDAW, Inc.

Throughout the 14 counts, active boats accounted for only about 20–30 percent of all boats observed. An additional 100–150 boats were observed in dock slips, moored, and beached on shore during the non-peak season counts, while from 250 to over 500 were observed in those locations during the peak season and holiday counts. Each type of storage contained similar numbers of boats during the peak season, with approximately

100–200 at mooring buoys or balls, 100–150 at dock slips, and 120–215 on shore. Taking all boats into account (in use and not in use), approximately 150–270 boats were observed at the reservoir during the early and late non-peak season, 500–640 during the peak season, and over 700 on Independence Day, when the maximum count was obtained.

Lake Almanor BAOT by Segment

This section describes the amount of boating use observed on the four segments without regard for the differing water surface acreage of the segments. Boat traffic density, which does take acreage into consideration, is addressed in Section E5.2.3.4.3.6. Although the research team divided the reservoir into four segments, data was not collected for Segment A (north of SR 36) because there was no boatable water in that area during the 2001 data collection season due to drought conditions.

Overall, Segment C received the most use with an average of about 60 active boats on the water during the peak season and holiday counts and an average of about 45 boats across all counts. Segment B received about 25 percent less use than Segment C with an average of about 45 active boats during the peak season and holiday counts, and about 35 boats when non-peak season counts are included.

Segment D was observed to receive only slightly less boat use than Segment C with an average of 40 active boats during the peak season counts and an average of about 32 active boats across all counts.

The observations did not reveal large differences in the types of boats using each segment. Powerboats dominate use in all areas, while sailboats and paddle-powered craft were never observed in large numbers. However, PWC were particularly prevalent on Segment C during some counts, with 20 to 27 PWC observed on several occasions.

Butt Valley Reservoir

Observed boat activity on Butt Valley Reservoir was comparatively low throughout the data collection period, with one to 10 boats counted during each of the 14 observations. Few boats were found to be present during the seven counts which were conducted between 8:00 and 9:00 a.m. Higher counts were obtained during observations conducted between 4:00 and 7:00 p.m. Typically, most of the boats were powerboats and the rest were paddle-powered craft, such as canoes and kayaks.

E5.2.3.4.3.2 Observations of Boating Related Activity Participation

Simultaneous with the boat counts, observers recorded information about the general boating activities the boats they observed were engaged in, such as cruising, waterskiing or tubing, and fishing. Activity type was recorded for over 90 percent of boats observed during the non-peak season counts and for 60–75 percent during the peak season.

Boats for which no activity was recorded were typically at too great a distance to determine whether they were engaged in cruising, skiing, or fishing.

Lake Almanor Reservoir-Wide On-Water Activities

About one-half of the boats observed during the early non-peak season, and of about 30–40 percent of boats through June and July were observed to be cruising. About 10 percent of boats were engaged in waterskiing and similar activities early in the season, and 20–30 percent from June to the Labor Day holiday. In contrast, fishing was the observed activity of about one-third of the boats during May, but fell to 15–25 percent during the peak season (between the Memorial Day and Labor Day Weekends). Fishing was the dominant activity in late September and early October, with 50–70 percent of boats engaged, while waterskiing became non-existent during this cooler weather period.

Lake Almanor On-Water Activities by Segment

Cruising, waterskiing, and fishing activities appear to be fairly evenly distributed on Lake Almanor, although there may be some emphasis on cruising in Segment C, perhaps due to its proximity to the Lake Almanor Country Club and residential areas. Fishing is slightly more prevalent on Segment B. The overall even distribution of activities is not unexpected given the relatively uniform character of the reservoir segments, each of which is composed of large areas of open water with few coves and no narrow areas.

Butt Valley Reservoir On-Water Activities

Due to its limited size, the speed restriction on the reservoir, and the presence of numerous stumps, fishing and paddling are the primary boating activities on Butt Valley Reservoir, rather than cruising as at Lake Almanor. This was confirmed during the observations conducted from near shore roads.

Lake Almanor Shoreline Activities

Simultaneous to the on-water boat counts, observers recorded the activities of recreationists using the shoreline of the reservoir. As the reservoir level drops during the summer, an increasing amount of shoreline becomes available for dispersed shoreline use, in particular where the shoreline is less steep. This is particularly true at the northern end of the reservoir, where a strip of land hundreds of feet wide is exposed when the reservoir is 15–20 feet below full pool as it was during the 2001 data collection period. However, much of this exposed land below the typical high pool level is soft and muddy and thus not attractive for shoreline activities. Shoreline users were recorded engaged in the following activities: bank fishing, picnicking, swimming and sunning on shore, swimming and sunning on a private dock, hiking or walking, and dispersed camping (with or without vehicles or boats).

Shoreline activity was observed to be fairly light during the early and late non-peak season.

Each day, there was observed about 15–30 bank anglers, five–20 picnickers, 20–80 people swimming or sunning on shore, 10–20 people swimming or sunning on a private dock, five–10 people hiking or walking, and usually none or just a few people camping.

Several types of shoreline activity greatly increased during the peak season. Typically 40–60 picnickers were observed as well as from 117 to 278 people swimming and sunning on shore. Over 200 picnickers and 800 people swimming and sunning on shore

were counted on Independence Day. Most peak season observations revealed from about 50 to 130 people swimming and sunning on private docks, with a high of 249 on Independence Day. Hiking and walking also increased somewhat, to a range of 20–30 people and a maximum of 45 on Independence Day. Dispersed camping on the shoreline remained very light throughout the data collection period with no more than a few campers counted at any time and usually none counted. Some visitors brought vehicles down to the shoreline. From 10 to 35 vehicles were counted during most peak season observations, but 120 vehicles were counted on Independence Day.

E5.2.3.4.3.3 Boating-Related Activity Participation (Self-Reported)

Participants in the on-site visitor survey were asked to indicate the activities they would be participating in during their current visit to the Project area from a list of 24 activities.

Lake Almanor

Participation rates in recreation activities reported by visitors surveyed at Lake Almanor are shown in Table E5.2.3-7. The eight boating-related activities in the survey list have been highlighted in bold text for reference. Of these, fishing had the highest level of participation at 60 percent. (No distinction was made between fishing from shore and fishing from a boat in the list, so the level of fishing from boats would be high, but lower than 60 percent. Also, it is recognized that some swimming occurs from boats in addition to that done from shore.)

Table E5.2.3-7
Lake Almanor and Butt Valley Reservoir Activity Participation

SURVEY QUESTION: Which of the following activities are you and/or members of your group participating in during your visit to this area?		
Activity	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**
Swimming	76	83
Fishing	**60**	**83**
Sunbathing	57	59
Sightseeing	51	57
Tent Camping	51	75
Hiking	46	60
Wildlife Viewing	43	61
Picnicking	43	37
Motorboating	**42**	**30**
Bicycling on Roads /Bike Paths	37	36
RV Camping	35	35
Waterskiing	**34**	**3**
Other	22	14
Mountain Biking On Trails	16	12
Golf	15	6
Canoeing	**9**	**22**
Riding OHVs	9	8
Personal Watercraft Use	**8**	**1**
Hunting	6	7
Horseback Riding	6	2
Kayaking	**5**	**12**
Sailing	**3**	**8**
Windsurfing	**2**	**5**

Note: Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Motorboating was the next most commonly reported boating-related activity with 42 percent participation and just over one-third of on-site participants waterskied at Lake Almanor. Less than one in 10 visitors canoed (9 percent) or kayaked (5 percent). Eight percent used PWCs. Sailing and windsurfing were the least common boating-related activity reported by Lake Almanor participants, with 3 and 2 percent participation rates, respectively.

Butt Valley Reservoir

Similar to Lake Almanor, fishing was the most commonly reported activity at Butt Valley Reservoir, but with a considerably higher participation rate of 83 percent. Again, the proportion of people fishing from shore versus from a boat cannot be discerned, although from researcher observations it is likely that the majority of these were fishing from boats. The next most common activity reported by visitors at Butt Valley Reservoir was motorboating (30 percent). The 22 percent who canoed and 12 percent who kayaked underscore the relative importance of paddling activities at Butt Valley Reservoir as compared to Lake Almanor.

Sailing, windsurfing, waterskiing, and PWC use (8 percent, 5 percent, 3 percent, and 1 percent participation rates, respectively) were all minor activities for Butt Valley Reservoir visitors. Waterskiing and PWC use would likely exceed the speed limits at Butt Valley Reservoir. As a result, there may be a lack of law enforcement presence or a lack of visitor knowledge about the county ordinance. Participants may also have been on Lake Almanor when engaged in these activities.

E5.2.3.4.3.4 Type/Ownership of Watercraft/Type of On-Site Storage and Boat Launches

A subsection of the mail survey asked Lake Almanor and Butt Valley Reservoir boaters to provide type, ownership, and storage information regarding the watercraft they use, and information on boat launch use.

Ownership of Watercraft

Information detailing the ownership of boats used on Project reservoirs is provided in Table E5.2.3-8. The table also shows that some users utilize both reservoirs in the Project. For example, while 69 percent of the 197 responding to the question said that they own the watercraft they use on Almanor, 9 percent also use the watercraft at Butt Valley Reservoir. Just over 70 percent of participants surveyed as part of the Butt Valley Reservoir mail survey indicated that they use watercraft at Butt Valley Reservoir, and 30 percent of these individuals reported using their watercraft at Lake Almanor.

Just under one-third (32 percent) of Almanor survey respondents indicated that they use friends' or relatives' boats at Lake Almanor, while 28 percent of Butt Valley Reservoir respondents indicated they use boats owned by other parties. Just under one-fifth (19 percent) of visitors surveyed in the Lake Almanor survey indicated that they rent boats or watercraft for use on Lake Almanor, while 5 percent of Butt Valley Reservoir respondents indicated that they rent boats.

Table E5.2.3-8
Ownership of Watercraft Used at Project Reservoirs

SURVEY QUESTION: Complete the following table according to your boating use of Lake Almanor and/or Butt Valley Reservoir.				
Method	**Lake Almanor Respondents (percent)**		**Butt Valley Reservoir Respondents (percent)**	
	LA	**BV**	**LA**	**BV**
I own a boat/watercraft that I use on ...	69	9	30	71
I use a friend's or relative's boat/watercraft on ...	32	3	12	28
I rent a boat/watercraft that I use on ...	19	1	5	—

LA=Lake Almanor; BV=Butt Valley Reservoir

Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Ownership of boats used at Project reservoirs by area residents is detailed in Table E5.2.3-9. Shoreline property owners reported the highest ownership of watercraft used on Lake Almanor at 82 percent. Approximately two-thirds of shoreline back-lot property owners and nearly 40 percent of towns and environs residents also indicated that they own a watercraft that is used on Lake Almanor. An additional 12 percent of shoreline back-lot property owners and 18 percent of towns and environs residents reported using friends' or relatives' boats on Lake Almanor. Shoreline back-lot residents were the most likely to rent boats for use at Lake Almanor, with 17 percent renting. Area resident use of watercraft at Butt Valley Reservoir is lower than Lake Almanor, with a comparatively low 11 percent of both shoreline back-lot and towns/environs residents and 8 percent of shoreline residents indicating they use their boats there. Only a few percent of any area resident group use other people's boats on Butt Valley Reservoir and none reported using rental boats (there are no rental facilities on Butt Valley Reservoir itself).

Table E5.2.3-9
Ownership of Watercraft Used in Project Area by Residents

SURVEY QUESTION: Complete the following table according to your boating use of Lake Almanor and/or Butt Valley Reservoir.						
Answers	**Shoreline (percent)**		**Shoreline Back-lot (percent)**		**Towns and Environs (percent)**	
	LA	**BV**	**LA**	**BV**	**LA**	**BV**
I own a boat/watercraft that I use on …	82	8	65	11	39	11
I use a friend's or relative's boat/watercraft on …	9	1	12	1	18	4
I rent a boat/watercraft that I use on …	10	—	17	—	5	—

LA = Lake Almanor; BV = Butt Valley Reservoir

Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Types of Watercraft Used

Information regarding the types of boats that recreation visitors reported using in the Project area is provided in Table E5.2.3-10. Powered ski and fishing boats had the highest incidence of use at Lake Almanor at 48 and 45 percent, respectively. The next most common watercraft were powered pleasure boats (e.g., runabouts) and PWC, both used by 23 percent of Lake Almanor visitors.

At Butt Valley Reservoir, powerboats used for fishing were the most frequently used at 56 percent. Canoes were the next most commonly used boats at Butt Valley Reservoir, with 24 percent using them, while a relatively low 15 percent used powered pleasure boats.

Table E5.2.3-10
Types of Watercraft Used by UNFFR Visitors

SURVEY QUESTION: What type of watercraft do you primarily use on the Lake Almanor and/or Butt Valley Reservoir?				
Type of Watercraft	**Lake Almanor Respondents (percent)**		**Butt Valley Reservoir Respondents (percent)**	
	LA	**BV**	**LA**	**BV**
Ski boat—power	48	1	10	3
Fishing boat—power	45	9	15	56
Pleasure boat—power	23	2	7	15
Canoe	9	2	3	24
Kayak	9	2	4	14
Houseboat	4	—	—	—
Personal Watercraft/Jet-ski/Waverunner	23	—	5	—
Sailboat	2	—	1	10
Other	3	<1	—	3

LA=Lake Almanor; BV=Butt Valley Reservoir

Note: Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

The types of boats used by area residents are provided in Table E5.2.3-11. Shoreline residents were similar to Project visitors in their use of boats at Lake Almanor, with 46 percent reporting using ski boats at Almanor, followed by fishing boats (30 percent), and pleasure boats (27 percent), all powered. Shoreline back-lot residents were more likely to report using fishing boats (46 percent) followed by ski boats (26 percent) and pleasure boats (25 percent). Towns and environs residents reported about the same level of fishing boat use on Lake Almanor as the other resident groups at 33 percent. Their use of ski boats and pleasure boats was lower than the other residents at 19 and 13 percent, respectively.

Overall, the area residents' responses indicate that their use of Butt Valley Reservoir is low. Thirteen percent from towns and environs, 10 percent from shoreline back-lots, and 6 percent of shoreline residents used fishing boats at Butt Valley Reservoir. No more than 3 percent of any area resident group reported using any other type of boat there.

Table E5.2.3-11
Types of Watercraft Used by Residents

Type of Watercraft	Shoreline (percent)		Shoreline Back-lot (percent)		Towns and Environs (percent)	
	LA	BV	LA	BV	LA	BV
Ski boat—power	46	—	26	1	19	1
Fishing boat—power	30	6	35	10	33	13
Pleasure boat—power	27	1	25	1	13	3
Canoe	13	2	5	1	1	3
Kayak	7	1	7	1	3	1
Houseboat	3	—	3	—	3	—
Personal Watercraft/Jet-ski/Waverunner	12	—	5	—	9	1
Sailboat	12	—	5	—	3	1

LA=Lake Almanor; BV=Butt Valley Reservoir

Note: Responses do not sum to 100 percent because this is a multiple response question.

Source: EDAW, Inc.

Watercraft Moorage/Storage Used

Watercraft storage information from visitors has been provided in Table E5.2.3-12 and shows that visitors are most likely to store their boats on trailers on shore (36 percent) and beached on shore (28 percent) when at Lake Almanor. Few visitors reported using mooring buoys or docks, which are generally owned by shoreline residents. Sixteen percent used marina slips, which are provided for long- and short-term use by commercial operators.

Boaters surveyed at Butt Valley Reservoir were much more likely to store their boats on the beach than any other storage method, with 74 percent using that means of storage. Relatively few Lake Almanor visitors reported using any type of storage at Butt Valley Reservoir, and vice-versa, although 13 percent of Butt Valley Reservoir visitors did store a boat beached on shore while at Lake Almanor, and 10 percent kept a boat on a trailer on shore.

Table E5.2.3-12
Visitors' Watercraft Moorage and Storage

SURVEY QUESTION: If you use or own a boat or watercraft, where do you typically moor or store the boat while at Lake Almanor and/or Butt Valley Reservoir?				
Watercraft Moorage/Storage Method	**Lake Almanor Respondents (percent)**		**Butt Valley Reservoir Respondents (percent)**	
	LA	**BV**	**LA**	**BV**
Single dock	4	—	2	—
Trailer on-shore	36	7	10	6
Community dock	7	—	2	—
Marina slip	16	—	4	—
Mooring ball or buoy	5	1	3	17
On the beach	28	4	13	74
Other	8	1	1	1

LA=Lake Almanor; BV=Butt Valley Reservoir

Note: Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Information regarding area residents' storage of their boats is detailed in Table E5.2.3-13. Area residents with shoreline property most commonly store their boats at a single dock (45 percent), followed by mooring balls or buoys (34 percent). Shoreline back-lot residents reported using trailers on shore as their most common storage method (45 percent), and 15 percent reported using marinas to store their boats.

Boaters from the Project area towns and environs also most commonly stored their boat on a trailer on shore (25 percent) or on the beach (9 percent) at Lake Almanor.

Just as few area residents reported using boats on Butt Valley Reservoir, few reported using any type of moorage or storage. It seems likely that the minority of area residents who boat on Butt Valley Reservoir would not stay overnight and thus would have less need for storage or moorage.

Table E5.2.3-13
Area Resident Watercraft Moorage and Storage

SURVEY QUESTION: If you use or own a boat or watercraft, where do you typically moor or store the boat while at Lake Almanor and/or Butt Valley Reservoir?						
Watercraft Moorage/Storage Method	**Shoreline (percent)**		**Shoreline Back-lot (percent)**		**Towns and Environs (percent)**	
	LA	**BV**	**LA**	**BV**	**LA**	**BV**
Single dock	45	—	4	—	5	—
Trailer on-shore	12	1	45	9	25	6
Community dock	1	1	3	—	3	—
Marina slip	6	—	15	—	4	—
Mooring ball or buoy	34	2	3	1	2	—
On the beach	4	1	3	1	9	2

LA=Lake Almanor; BV=Butt Valley Reservoir

Source: EDAW, Inc.

Use of Boat Launches

Use of Project area boat launches by recreation visitors is detailed in Tables E5.2.3-14–16. Most of the study participants from both Lake Almanor and Butt Valley Reservoir reported using boat launches at either of the reservoirs. The nearly 90 percent of Lake Almanor and nearly 80 percent of Butt Valley Reservoir visitors who did so were also asked to indicate which launches they used.

The largest numbers of visitors at Lake Almanor reported using the public boat launches at Canyon Dam (43 percent) and Lake Almanor Campground (27 percent). The next most commonly used boat launches were private, with 13 percent using a launch at Lake Almanor Resort and 12 percent using a launch at Plumas Pines Resort. From 1 to 9 percent used any of the other seven resort launches (see Table E5.2.3-15). Just over half of the visitors contacted at Butt Valley Reservoir sites (52 percent) used the Alder Creek DUA/Boat Launch there while 20 percent also used the two public launches at Lake Almanor.

Table E5.2.3-14
Project Boat Launch Use by Visitors

SURVEY QUESTION: Have you ever used one of the boat launches at Lake Almanor or Butt Valley Reservoir?		
Response	**Lake Almanor Respondents (percent)**	**Butt Valley Reservoir Respondents (percent)**
Yes	89	79
No	11	21

Source: EDAW, Inc.

Table E5.2.3-15
Visitor Use of Project Area Boat Launches

SURVEY QUESTION: Which of the following boat launches do you use?		
Boat Launch Location	**Lake Almanor Respondents (percent)**	**Butt Valley Reservoir Respondents (percent)**
Lake Almanor Resort	13	3
Canyon Dam	43	20
Alder Creek	3	52
Big Cove Resort	7	—
Camp Prattville	5	6
Lake Cove Resort	1	1
Lake Haven Resort	1	1
Lassen View Resort	4	4
Little Norway	7	—
North Shore Campground	9	4
Plumas Pines Resort	12	1
Almanor Campground	27	20
Other	12	15

Note: Responses do not sum to 100 percent since this is a multiple response question.

Source: EDAW, Inc.

Table E5.2.3-16
Boat Launches Most Frequently Used by Visitors

SURVEY QUESTION: Which boat launch do you use most frequently?		
Boat Launch Location	**Lake Almanor Respondents (percent)**	**Butt Valley Reservoir Respondents (percent)**
Canyon Dam	40	4
Almanor Campground	19	6
Other	12	16
Lake Almanor Resort	8	—
Plumas Pines Resort	7	2
Big Cove Resort	6	—
Lassen View Resort	3	2
Little Norway	3	—
North Shore Campground	2	3
Alder Creek	1	65
Camp Prattville	—	2
Lake Cove Resort	—	—
Lake Haven Resort	—	2

Source: EDAW, Inc.

Six percent or fewer used any other launches. When boating survey participants were asked to indicate which boat launch they used most frequently, the largest percentage (40 percent) indicated Canyon Dam, followed by 19 percent indicating Almanor Campground (see Table E5.2.3-16). From 2 to 8 percent listed one of the private launch sites as the one they use most often.

As expected, Alder Creek DUA/Boat Launch, the only one at Butt Valley Reservoir, was cited by 65 percent of Butt Valley Reservoir visitors as the boat launch they most frequently used. From 2 to 4 percent mentioned other (Lake Almanor) launches.

Table E5.2.3-17 details the most frequently used boat launches by participants in the area resident survey. Residents most commonly indicated "other" as their primary boat launch, presumably using the private home owner association facilities (such as those at Lake Almanor Country Club or Hamilton Branch), or launching boats from their own shoreline lots. Forty-five percent of shoreline owners and 34 percent of shoreline back-lot residents indicated using sites other than those indicated in the survey. Canyon Dam Boat Launch/DUA was most commonly used by residents in the towns and environs category, and was also used most often by 23 percent of back-lot residents.

Table E5.2.3-17
Boat Launches Most Frequently Used by Area Residents

Boat Launch Location	Shoreline (percent)	Shoreline Back-lot (percent)	Towns and Environs (percent)
Lake Almanor Resort	10	13	11
Canyon Dam	11	23	52
Alder Creek	1	—	2
Big Cove Resort	6	9	8
Camp Prattville	3	2	5
Lake Cove Resort	1	4	—
Lake Haven Resort	4	2	—
Lassen View Resort	1	—	—
Little Norway	3	4	3
North Shore Campground	9	6	3
Plumas Pines Resort	1	2	2
Almanor Campground	5	3	7
Other	45	34	8

Source: EDAW, Inc.

Waiting Times for Launching Boats

Information relating to the necessity of waiting at Project area boat launches is reported in Tables E5.2.3-18 and 19. Two-thirds (66 percent) of Lake Almanor visitors indicated that they never wait at the boat launch they most frequently use, while 91 percent of Butt Valley Reservoir visitors (two-thirds of whom use Alder Creek DUA/Boat Launch most often) said they do not typically have to wait to launch. In contrast, about 70 percent of area residents reported having to wait to launch at their most often used Project area boat launches.

If participants indicated that they had to wait at Project area boat launches, they were asked to indicate the length of their wait in minutes. A large portion of those indicating a wait did not provide a specific number of minutes, so this information has not been

presented in tabular format. However, those reporting a wait indicated that this time was brief, averaging between 5 and 10 minutes.

Table E5.2.3-18
Percentage of Visiting Boaters that Wait for Boat Launches

SURVEY QUESTION: Do you typically have to wait to use the boat launch you most frequently use?		
Response	**Lake Almanor Respondents (percent)**	**Butt Valley Reservoir Respondents (percent)**
No	66	91
Yes	34	9

Source: EDAW, Inc.

Table E5.2.3-19
Percentage of Area Resident Boaters that Wait for Boat Launches

SURVEY QUESTION: Do you typically have to wait to use the boat launch you most frequently use?			
Response	**Shoreline (percent)**	**Shoreline Back-lot (percent)**	**Towns and Environs (percent)**
No	28	31	29
Yes	72	69	71

Source: EDAW, Inc.

Area Residents' Use of Private Docks

The average number of days that area residents used their docks across the seasons is reported in Table E5.2.3-20. Not surprisingly, the number of days that residents report launching boats from private docks is highest during the period from Memorial Day through Labor Day, with shoreline residents reporting that they launched their boats from their docks an average of 30 days. Shoreline back-lot residents reported an average of 20 days of use in the summer while those from the towns and environs group reported an average of 13 days of use during the summer high-use season.

Table E5.2.3-20
Average Number of Days Boats are Launched from Area Residents' Docks

Season	Shoreline (days)	Shoreline Back-lot (days)	Towns and Environs (days)
Number of Days in Spring (April and May)	10	8	6
Number of Days in Summer (Memorial Day through Labor Day)	30	20	13
Number of Days in Fall (Labor Day through October)	10	8	9
Number of Days in Winter (November through March)	3	3	5

Source: EDAW, Inc.

Dock use declined by two-thirds to one-half for the shoulder seasons in spring and fall. During the winter months, launches declined to 3 to 5 days, on average, for all three area resident groups.

E5.2.3.4.3.5 Support Facility Use

This section describes three types of support facility use: boat ramp use, marina use, and private dock use. Boat ramp use is based on traffic count data available from six sites at Lake Almanor and one site at Butt Valley Reservoir.

These sites include:

- Canyon Dam Boat Launch/DUA (Forest Service);
- Hamilton Branch Boat Launch (Private);
- Almanor Boat Launch (Forest Service);
- Lake Almanor West Boat Launch (Private);
- Lake Almanor Country Club 1 Boat Launch (Private);

- Lake Almanor Country Club 2 Boat Launch (Private); and
- Alder Creek DUA/Boat Launch (Licensee).

This information is primarily presented in Section E5.2.2—Existing Recreation Use Study, but is also pertinent to this study. The objective is to describe use levels at the boat launches listed above. The second portion of this section describes capacity, and when available, occupancy of the marinas at Lake Almanor. While several marina owners/operators did not provide capacity and occupancy data for this past recreation season, a fair number of marina owners/operators did submit information.

From the information that was provided, extrapolations were made about similar facilities in the Project area for which data were not provided. Occupancy rates are reported where available. The objective was to list marina capacities and estimate overall marina use at Lake Almanor during the recreation season.

The third item in this section describes Lake Almanor's numerous commercial dock facilities; in essence, their collective capacity. Occupancy rates are not reported, as information was not solicited from commercial dock owners and was beyond the scope of this study. However, estimates were made about seasonal use distribution.

Boat Ramps

In this section, boat launch occupancy rates for the season are reported. A more detailed discussion on occupancy rates at Project area boat launches can be found in the

Recreation Carrying Capacity Analysis (E5.2.5). Occupancy rates for Canyon Dam Boat Launch/DUA, Almanor Boat Launch, and Alder Creek DUA/Boat Launch have been summarized in Table E5.2.3-21. Canyon Dam Boat Launch/DUA and Alder Creek DUA/Boat Launch were the only sites of the seven to exceed capacity for vehicles. Canyon Dam Boat Launch/DUA had the highest overall occupancy rates with an average of approximately 100 percent of vehicle spaces occupied. As noted later in this report, the occupancy rates for this site increased considerably after Almanor Boat Launch was not useable during the 2001 recreation season. The second highest vehicle occupancy rates occurred at Alder Creek DUA/Boat Launch at Butt Valley Reservoir, with an occupancy rate of 69 percent. Almanor Boat Launch had an average occupancy rate of 49 percent, the lowest vehicle occupancy rates of the three public boat launch sites.

Table E5.2.3-21
Current DUA/Boat Launch
Seasonal Parking Area Capacity/Occupancy

Sites and Vehicles/Developments Counted	Parking Capacity	Percent Occupancy
Canyon Dam Boat Launch/DUA		
Vehicles and vehicles with trailers	64	99
Almanor Boat Launch		
Vehicles and vehicles with trailers	53	49
Alder Creek DUA/Boat Launch		
Vehicles and vehicles with trailers	20	69

Source: EDAW, Inc.

Marinas and Resort Docks

This section describes capacity, and when available occupancy, of marinas at Lake Almanor. Researchers identified 22 marinas or substantial boat support facilities such as dock slips and buoys. The majority of these facilities are part of a resort; they are not stand-alone marinas. Seven of the 22 marinas identified provided use data. For the

remainder, only capacity is reported. Researchers were most interested in occupancy across the entire season in order to compare seasonal variations. Marina owners/operators were asked to estimate or report early, peak, and late season percent occupancy. Table E5.2.3-22 shows capacities and occupancy levels, when available, of marinas at Lake Almanor.

Capacity ranged from five to 180 boat slips at the 22 identified marinas. All together there are 838 slips with an average of 38 slips per marina. As Table E5.2.3-22 shows, the highest use for the seven marinas that provided information was during the peak season. Use during this time ranged from 60 to 100 percent occupancy. Average occupancy for the peak season for the marinas that provided data was 91 percent.

Lower use occurred during the early season, with four of the seven reporting 80–100 percent occupancy, and the others reporting 40–60 percent occupancy. Average occupancy for the early season was 75 percent.

A similar pattern of use was reported for the late season, with occupancy ranging from 45 to 100 percent occupancy. Average occupancy for the late season for the seven marinas was 73 percent. Overall (total season) use estimates by owner/operators of marinas relative to past years ranged from –15 to +30 percent.

Table E5.2.3-22
Lake Almanor Marina Capacity and Percent Occupancy

Name of Marina or Resort with Boating Facilities	Number of Dock Slips/ Use Comments	Percent Occupancy		
		Early Season[1]	Peak Season[2]	Late Season[3]
Big Cove Resort	180 (15% less than in 2000)	95	100	95
Lake Haven Resort	12 (Same use as in 2000)	80	95	75
Lassen View Resort	96 (15% less than in 2000)	40	96	50
Dorado Inn	8 (First season in 2001)	60	95	45
Little Norway Resort	110 (Same as years past)	60	60	60
Knotty Pine Resort	74 (Same as years past)	92	92	92
Plumas Pines Resort	94 (30% more than usual)	100	100	100
Almanor Lakefront Village	12	No occupancy data available.		
Lake Almanor Lakeside Lodge	6			
Almanor Lakeside Resort	10			
Lake Almanor Resort	20			
Almanor Lakeside Villas	30			
Lake Cove Resort	40			
Country Club Resorts	12			
High Sierra Resort	10			
Vagabond Resort	16			
Villager Resort	8			
North Shore Campground	42			
Wilson's Camp Prattville	39			
Novotny's	8			
Moonspinners Resort	6 (Now private residences)			
Miller's Resort	5 (Now private residences)			

[1]Before Memorial Day; [2]Memorial Day to Labor Day; [3]After Labor Day

Source: EDAW, Inc.

Taking the average seasonal use from the seven marinas reporting use, estimates were calculated for the number of boats docked at all marinas at Lake Almanor during early, peak, and late seasons. Average occupancy for the early season was 75 percent. If 75 percent of 838 available dock slips were occupied, this produces an estimate of approximately 629 boats at Lake Almanor marina dock slips during the early season.

Average occupancy for the peak season was 91 percent. If 91 percent of 838 available dock slips were occupied, this produces an estimated 763 boats at Lake Almanor marina dock slips during the peak season. Average occupancy for the late season was 73 percent. If 73 percent of 838 available dock slips were occupied, this produces an estimate of approximately 612 boats at Lake Almanor marina dock slips during the late season.

Private Docks, Buoys, and Boats on Shore

This section describes Lake Alamanor's private docks, buoys, and the numbers of boats counted on shore during sample dates in 2001. Only use at Lake Almanor is reported; there are no private docks or buoys at Butt Valley Reservoir.

As Table E5.2.3-23 shows, researchers counted the amount of docked boats, moored boats, and beached boats at Lake Almanor on 14 sample days from May 12 to October 13. The sample dates included five non-peak dates; two before Memorial Day and three after the holiday. All three recreation season holidays were sampled. There were six non-holiday peak sample dates as well.

The Licensee supplied researchers with capacity figures for Lake Almanor docks (418) and buoys (540). This is Lake Almanor's private dock and buoy capacity, in addition to the 838 marina slips. Researchers assumed that the residential and marina docks host one boat per dock slip. For example, 10 residential docks could host 10 boats and a marina

with 20 slips could host 20 boats. In other words, residential and marina dock capacity is counted in the same manner. However, researchers did on occasion count more than one boat at a private dock.

Table E5.2.3-23
Lake Almanor Private Dock and Buoy Count Schedule

Sample Day	Season	Date
1	Non-Peak	12-May
2	Non-Peak	19-May
3	Peak Holiday	26-May
4	Peak	16-Jun
5	Peak	23-Jun
6	Peak Holiday	4-Jul
7	Peak	28-Jul
8	Peak	12-Aug
9	Peak	18-Aug
10	Peak	25-Aug
11	Peak Holiday	1-Sep
12	Non-Peak	29-Sep
13	Non-Peak	6-Oct
14	Non-Peak	13-Oct

Source: EDAW, Inc.

As Table E5.2.3-24 displays, researchers observed a total of 1,398 boats at dock slips during the 14 sample days at Lake Almanor, resulting in an average of 100 boats at docks observed each sample date. Additionally, researchers counted a total of 1,488 boats attached to buoys and 1,697 boats beached on the shore, resulting in an average of 106 moored boats and 121 beached boats each sample date. (It is likely that residents used the majority of observed boats on shore, as most were in residential areas rather than near marinas.)

Table E5.2.3-24
Total Observed Docked, Moored and Beached Boats

Count Date	Boats at Docks	Moored Boats	Beached Boats
12-May	55	30	67
19-May	63	39	81
26-May	93	44	116
16-Jun	108	141	120
23-Jun	123	164	124
4-Jul	164	213	158
28-Jul	150	177	146
12-Aug	145	170	136
18-Aug	138	170	186
25-Aug	120	134	214
1-Sep	124	130	175
29-Sep	50	40	93
6-Oct	45	28	86
13-Oct	20	12	86
Total:	**1,398**	**1,488**	**1,697**
Average:	**99.9**	**106.3**	**121.2**

Source: EDAW, Inc.

It is not known how many of the 418 docks or 540 buoys were in use (being used to store a boat) during the 2001 boating season. Nor is it known how many of the active boats observed on the water originated from private docks, mooring buoys, or a shoreline "beaching" location.

Given these data gaps, the counts of boats at private docks and mooring buoys and beached on shore can indicate only the amount of additional boat traffic that could potentially have been contributed by these boats stored on-site. Shoreline resident survey data discussed earlier provides some indication of how frequently docked boats are used through the year.

E5.2.3.4.3.6 Comparison of Use Levels with Lake Almanor Pool Level

Comparison of boating use levels observed on Lake Almanor with the pool level of the reservoir as it changed through the 2001 data collection season provides an informative description of boating conditions compared to number of boats observed alone. In this section, numbers of boats observed are compared with estimates of the surface area of the entire reservoir and each reservoir segment at the time the counts were conducted. Calculations of the reservoir surface area available per boat provide comparable measures of the density of boat traffic for the reservoir as a whole and for individual segments. Boat traffic density has a strong influence on boater's recreation experience and their perceptions of on-water crowding, and is a key variable in determining social capacity for the reservoir surface.

2001 Season Boat Use Levels and Surface Water Acreage

During the 2001 data collection period, the entire reservoir's elevation ranged from approximately 4,480 feet (on May 12, the day of the first observation) to 4,473 feet (on October 13, the day of the last observation). The pool level rose slightly from May 12 until early June then slowly fell through the remainder of the 2001 data collection period. The highest pool elevation coinciding with on-water observation was 4,480.3 feet on May 26. Surface area was estimated to be about 23,700 acres on May 26 and 21,740 acres on October 13, a range of 1,960 surface water acres and a reduction in surface area of 8 percent over that period.

The preceding section of this document reported that observed boat traffic ranged from 38 to 87 boats during non-peak season observations and from 104 to 183 boats during the

peak season, including holidays. The reservoir's pool level did not appear to be a major factor in determining the amount of boat traffic on the reservoir. Instead, the maximum use level observations occurred on the Independence Day and September 1 (Labor Day Weekend) holidays (see Table E5.2.3-25).

Further, the number of boats observed during the three August dates exceeded the number observed throughout June and July (not including Independence Day), when the pool level was higher.

Table E5.2.3-25
Lake Almanor Surface Water Acres per Boat on Sample Days (Entire Reservoir)

Observation Number	Observation Date	Surface Acres [a]	Boats Observed	Acres per boat
1	May 12	23,564	65	363
2	May 19	23,630	87	272
3	May 26	23,698	112	212
4	June 16	23,578	104	227
5	June 23	23,490	139	169
6	July 4	23,315	183	127
7	July 28	22,904	139	165
8	Aug 12	22,697	149	152
9	Aug 18	22,556	146	155
10	Aug 25	22,408	155	145
11	Sept 1	22,346	183	122
12	Sept 29	22,117	38	582
13	Oct 6	21,914	35	626
14	Oct 13	21,740	39	557

Surface acre figures are based on Licensee reservoir elevation data and conversion tables (Licensee 2000b).

Source: EDAW, Inc.

Boat Traffic Density

Boat traffic density was consistently low on Lake Almanor as a whole throughout the 2001 data collection period. Surface area available per boat was over 270 acres before the Memorial Day Weekend and was 550 acres or more after the Labor Day Weekend.

Surface area available remained over 200 acres per boat through mid-June and ranged from about 122 to 170 acres per boat through the rest of the peak season. Over 120 acres were available per boat during the two holiday counts when 183 boats were observed.

2001 Season Boat Use Levels and Surface Water Acreage by Segment

The three segments of Lake Almanor addressed herein are of different sizes and are affected differently by changes in pool level. The greatest reduction in surface area as the pool level dropped occurred in Segment B due to the gently sloping nature of the northwest portion of the lake's shoreline. During the 2001 data collection season, surface area in Segment B fell from a high of approximately 12,240 acres to 10,720 acres, a reduction of 1,580 acres, or 13 percent, between May 26 and October 13 (see Figure E5.2.3-1). The shoreline in most other areas is relatively steep, so lowering of the pool level had only small effects on the surface area of the other reservoir segments, with reductions of 3 to 4 percent during the same period.

Boat Traffic Density by Segment

Due to the lower number of boats observed on the reservoir during the early and late non-peak season, the surface area available per boat was high in all segments at those times (see Table E5.2.3-26). From 600 to over 800 acres were available per boat on Segment

B. Segment C, about half the size of Segment B, provided from 200 to nearly 600 acres. The smallest segment, Segment D, provided from 140 to over 900 acres per boat (the latter occurred when only five boats shared 4,600 acres).

Table E5.2.3-26
Lake Almanor Surface Water Acres per Boat on Sample Days by Reservoir Segment: Non-Peak Season Observations

Date	Lake Segment	Boats Observed	Surface Acres	Acres per Boat
May 12	B	15	12,232	816
	C	23	6,612	288
	D	27	4,720	175
May 19	B	21	12,266	584
	C	33	6,631	201
	D	33	4,733	144
Sept 29	B	14	10,906	779
	C	17	6,575	387
	D	7	4,636	662
Oct 6	B	16	10,806	675
	C	14	6,515	465
	D	5	4,593	919
Oct 13	B	18	10,720	596
	C	11	6,463	588
	D	10	4,557	456

Surface acre figures are based on Licensee reservoir elevation data and conversion tables (Licensee 2000b).
Source: EDAW, Inc.

The surface area available to boats on each segment during the peak season was also large, on only one occasion dropping to less than 90 acres per boat (Segment C on July 4 holiday) (see Table E5.2.3-27).

The area available on the largest segment, Segment B, ranged from 138 acres on September 1 to over 293 acres on June 23. (An atypically low count of 16 boats on June 16 produced a surface area available per boat of over 760 acres.)

Surface area available per boat was generally lower and less variable on the smaller Segments C and D, in each area ranging from just under 90 to about 150 acres per boat.

Table E5.2.3-27
Lake Almanor Surface Water Acres per Boat Peak Season Observations

Date	Lake Segment	Boats Observed	Surface Acres	Acres per Boat
May 26	B	36	12,302	342
	C	44	6,650	151
	D	32	4,747	148
June16	B	16	12,239	765
	C	51	6,616	130
	D	37	4,723	128
June 23	B	31	12,194	393
	C	62	6,591	106
	D	46	4,705	102
July 4	B	61	11,965	196
	C	76	6,628	87
	D	46	4,712	102
July 28	B	33	11,754	356
	C	58	6,512	112
	D	48	4,638	97
Aug 12	B	40	11,464	287
	C	71	6,571	93
	D	38	4,662	123
Aug 18	B	50	11,393	228
	C	61	6,530	107
	D	35	4,633	132
Aug 25	B	52	11,318	218
	C	55	6,487	118
	D	48	4,603	96
Sept 1	B	82	11,287	138
	C	69	6,469	94
	D	32	4,590	143

Surface acre figures are based on Licensee reservoir elevation data and conversion tables (Licensee 2000b).

Source: EDAW, Inc.

E5.2.3.4.4 Assessment of Boaters' Perceptions

A major portion of the on-site and mail visitor survey questionnaires were devoted to measuring boaters' (and other visitors') perceptions of crowding and user conflicts, water

levels and other resource conditions, and reservoir management and facilities. Much of the perception data comes from responses to a mail survey question in which respondents were presented with a list of issues and asked to indicate whether these were "not a problem" or "a slight," "moderate," or "big" problem. For items specific to boating conditions, non-boaters were able to answer "N/A." Because only 3 percent of survey respondents contacted on Belden Reach were participating in boating during their current visit, results from that group are not included in these study results. (Belden Reach visitors' survey responses are discussed in Section E5.2.1—Questionnaire Survey.)

E5.2.3.4.4.1 Perceptions of Crowding

As part of the on-site recreation surveys conducted during the 2001 recreation season, visitors who participated in activities on the water were asked to indicate the degree of crowding they experienced on the four segments of Lake Almanor and on Butt Valley Reservoir. As noted in Section E5.2.1—Questionnaire Survey, a commonly utilized 9-point crowding scale was used to discern visitors' perceptions of crowding on specific water areas. The scale ranges from not at all crowded (1) to extremely crowded (9). In addition, three crowding-related items were included in the "problems" list alluded to above. These include the number of people using developed facilities, the number of watercraft on the reservoir, and wait times to launch a boat.

Although it was possible for respondents to provide answers to the crowding scale question regarding all the resource areas they had utilized on the survey day, a large majority only provided input about the site at which they were surveyed. Ninety-two to

98 percent responded N/A in reference to other areas, indicating they had not been on the water in those areas during their current visit. Therefore, the responses shown in Table E5.2.3-28 do not include responses referring to resource areas other than where the survey contact occurred (e.g.; the responses referring to Lake Almanor segments are from only respondents contacted at Lake Almanor sites).

Table E5.2.3-28
Perceptions of On-Water Crowding

SURVEY QUESTION: If you participated in activities on the water today, indicate how crowded you felt on the sections listed. If you were not in one of these areas today, mark N/A.				
Crowding Scale[c]	**Lake Almanor Segments (percent)**			**Butt Valley Reservoir (percent)[a]**
	B	**C**	**D**	
1 (Not at all Crowded)	34	34	32	43
2	20	21	18	20
3 (Slightly Crowded)	17	12	15	12
4	7	9	6	4
5	7	7	7	4
6 (moderately crowded)	9	11	12	10
7	4	3	4	2
8	1	3	4	3
9 (Extremely Crowded)	1	2	2	3
Mean Score[b]	2.9	3	3.2	2.8
Percent Responding N/A	66	72	53	9

[a]Percentages are based on respondents who provided crowding ratings only (does not include N/A responses).

[b]Mean scores are based on respondents who provided crowding ratings only (does not include N/A responses).

[c]Shelby and Heberlein 1986.

Source: EDAW, Inc.

Perceived Crowding on Lake Almanor

Overall, Lake Almanor visitors did not register a high level of concern with crowding. A majority of Lake Almanor visitors did not offer perceptions of on-water crowding on

Segments B, C, or D of Lake Almanor. (Responses for Segment A are not reported because there was no boatable water in that area during the 2001 survey season.) The 18 to 47 percent who did rate the level of crowding on each section provided a mean crowding rating of about 3 on the 9-point scale, or "slightly crowded." However, the highest percentages considered each section "not at all crowded."

The highest mean crowding rating, 3.2, was given by the 47 percent who had used Segment D that day. Twenty-two percent considered that section at least "moderately crowded" (a rating of six or higher on the 9-point scale). Overall, few visitors rated crowding on any section higher than six on the 9-point scale.

Forty-six percent of Lake Almanor visitors considered the number of people at developed facilities (including boat launches) to be "not a problem," and 59 percent felt that way about the number of watercraft on the reservoir (see Table E5.2.3-29).

In contrast, 18 percent and 8 percent, respectively, considered the number of people at developed facilities and the number of watercraft on the reservoir a moderate or big problem. Perceptions of crowding at public access areas can be indicated by opinions on wait times to launch a boat.

Fifty-six percent of Lake Almanor respondents considered this not to be a problem, while 11 percent considered it a slight problem (28 percent said the item was not applicable; i.e., they do not use boat launches).

Table E5.2.3-29
On-Water and Facility Crowding

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.
N/A=Not Applicable/No Answer; 1=Not a Problem; 2=A Slight Problem; 3=A Moderate Problem; 4=A Big Problem

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)				
	N/A	1	2	3	4	N/A	1	2	3	4
Number of people at developed facilities	10	46	27	14	4	5	52	28	14	2
Number of watercraft on the lake	12	59	21	6	2	3	88	5	3	1
Wait times to launch a boat or watercraft	28	56	11	3	1	21	74	4	1	—

Source: EDAW, Inc.

Perceived Crowding on Butt Valley Reservoir

Butt Valley Reservoir visitors also did not report a high level of concern about crowding. The 91 percent of Butt Valley Reservoir visitors who offered an on-water crowding rating provided a mean rating of 2.8, or just below the "slightly crowded" level. About 75 percent considered the reservoir to be between "not at all crowded" and "slightly crowded" while about 18 percent considered it at least "moderately crowded."

Fifty-two percent considered the number of people at developed facilities and 88 percent considered the number of watercraft on the reservoir to be "not a problem." Only 16 and 4 percent, respectively, considered the number of people or watercraft to be a moderate or big problem. Seventy-four percent said wait times to launch a boat were not a problem (21 percent responded N/A).

E5.2.3.4.4.2 Perceptions of Water Level Affects on Enjoyment and Safety

As part of the 2001 on-site survey, Lake Almanor and Butt Valley Reservoir visitors were asked to rate the reservoir water level that day in terms of how it affected their

ability to enjoy reservoir-related recreation activities and in terms of how safe they felt it was for recreation. In both cases, survey participants rated the acceptability of the water level from totally acceptable to totally unacceptable. Responses to these survey items are provided by site in Tables E5.2.3-30 and E5.2.3-31. Water levels during the 2001 survey were comparatively lower due to drought conditions and the California energy crisis. As a result, these conditions likely produced a more negative response as compared to a more normal year. This cause and effect relationship needs to be considered when reviewing these results.

Acceptability of Reservoir Levels at Lake Almanor

Lake Almanor visitors were somewhat divided in their opinions on reservoir levels. Over 40 percent indicated levels were unacceptable (either moderately or totally unacceptable) in terms of affects on their enjoyment. At the other end of the scale, slightly less than 30 percent rated the reservoir levels as either moderately or totally acceptable. Eighteen percent were neutral on this topic; 6 percent indicated that the question did not apply to them.

The data suggest that there is somewhat less concern about the affect of water levels on safety, with a nearly even split in opinions. Thirty-three percent of those surveyed indicated that the water level was either moderately or totally unacceptable, while 34 percent felt water levels were moderately or totally acceptable to provide safe recreation on Lake Almanor. One-fifth of respondents were neutral in their opinion.

Table E5.2.3-30
User Perceptions of Effect of Water Levels on Enjoyment

SURVEY QUESTION: How would you rate the lake water level today in terms of how it affected your ability to enjoy lake-related recreation activities?		
Level of Acceptability	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**
Totally Acceptable	15	56
Moderately Acceptable	14	11
Neutral	18	15
Moderately Unacceptable	29	9
Totally Unacceptable	13	4
Doesn't Apply to Me	6	1

Source: EDAW, Inc.

Table E5.2.3-31
User Perceptions of Effect of Water Level on Safety

SURVEY QUESTION: How would you rate the lake or river water level today in terms of how safe it is to use for recreation?		
Level of Acceptability	**Lake Almanor (percent)**	**Butt Valley Reservoir (percent)**
Totally Acceptable	17	58
Moderately Acceptable	17	15
Neutral	20	13
Moderately Unacceptable	23	5
Totally Unacceptable	10	4
Doesn't Apply to Me	8	2

Source: EDAW, Inc.

Acceptability of Water Levels at Butt Valley Reservoir

Concern about water levels was lower at Butt Valley Reservoir, which does not drawdown during the summer months like Lake Almanor. Over half of the respondents stated that the water level was totally acceptable, and two-thirds rated it at least moderately acceptable in terms of affects on enjoyment. In terms of safety, over half (58 percent) considered the water level to be totally acceptable and almost three-fourths (73 percent) considered it at least moderately acceptable. Only 13 percent of Butt Valley

Reservoir respondents felt water levels were moderately or totally unacceptable for enjoyment, and 9 percent indicated they held those opinions in regards to safety.

E5.2.3.4.4.3 Perceptions of User Conflicts

Similar to the crowding items discussed above, Project visitors were asked on the mail questionnaire "how much of a problem" various types of conflict and interaction with other people were. Two items address general conflict with other visitors unrelated to type of visitor (behavior and use of alcohol by other users), four address interactions between specific groups (e.g., between waterskiers and others), and two address additional boating-related problems (noise and speed/wakes effects). Non-boaters could respond "not applicable" to all questions that were targeted at boaters.

General Conflicts Between Users

Few Project area visitors consider conflicts related to the behavior of other visitors or alcohol use to be more than slight problems. Fifty-seven percent of Lake Almanor and 67 percent of Butt Valley Reservoir respondents consider behavior by other users to be "not a problem," while 27 and 20 percent, respectively, consider behavior to be a slight problem (see Table E5.2.3-32). Results were similar regarding alcohol use, with 60 percent at Lake Almanor and 70 percent at Butt Valley Reservoir considering that to not be a problem. Twenty-two percent of Lake Almanor respondents considered alcohol use to be a slight problem.

Table E5.2.3-32
Perceptions of Problems: User Conflicts

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.
N/A=Not Applicable/No Answer; 1=Not a Problem; 2=A Slight Problem; 3=A Moderate Problem; 4=A Big Problem

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)				
	N/A	1	2	3	4	N/A	1	2	3	4
Noise from boats and personal watercraft	8	61	19	7	5	1	85	9	3	2
Boat speed or wake effects	10	60	21	6	3	3	83	8	3	2
Behavior by other users	8	57	27	7	2	4	67	20	7	3
Use of alcohol by other users	12	60	22	6	1	5	70	12	8	5
Interaction between visitors and residents	17	72	8	3	1	Item not included				
Interaction between boaters and anglers	22	57	15	4	1	24	71	4	2	—
Interaction between PWCs (jet-skis/ waverunners) and other users	17	47	17	13	6	Item not included				
Interaction between waterskiers and other users	19	60	16	5	1	Item not included				

Note: "Item not included" indicates that item was deleted from the questionnaire sent to visitors to that resource area.

Source: EDAW, Inc.

Conflict Among Watercraft Groups and Between Visitors and Residents

The survey data did not reveal high levels of conflict among different watercraft groups. Interaction between boaters and anglers was considered "not a problem" by 57 percent and a slight problem by 15 percent of Lake Almanor respondents. Seventy-one percent of Butt Valley Reservoir respondents considered this to be "not a problem." Similarly, 60 percent at Lake Almanor considered interaction between waterskiers and other users to be not to be a problem and over three-fourths of respondents considered this at most to be only a slight problem.

Somewhat more concern was registered about interaction between PWC users and others with 19 percent considering this to be a moderate or big problem.

Yet, 64 percent of Lake Almanor respondents rated PWC interactions as a slight problem or not a problem. Seventy-two percent considered interaction between visitors and residents to be not a problem. (Items containing these last three types of interactions were asked of Lake Almanor visitors only.)

Other Boating-Related Conflicts

Among Lake Almanor survey respondents, 80 percent indicated that noise from powerboats and PWC was not a problem or a slight problem. An even higher 94 percent of Butt Valley Reservoir respondents indicated that noise was not or a slight problem. Concern about powerboat speed and wakes appears to be similarly low, with over 80 percent at Lake Almanor and over 90 percent at Butt Valley Reservoir considering this to be a slight problem or not a problem. (PWC and waterskiing prohibitions on Butt Valley Reservoir by county ordinance can be presumed to have resulted in the lower level of concern about these types of potential conflicts there.)

E5.2.3.4.4.4 Perceptions of Resource Conditions

Lake Almanor and Butt Valley Reservoir visitors were asked "how much of a problem" they considered several items related to resource conditions at Project area sites that could be expected to be of concern to boaters. These include items addressing litter and sanitation, water level fluctuation and associated resource affects, and water quality.

Shoreline Litter and Sanitation

Most Lake Almanor and Butt Valley Reservoir respondents did not consider shoreline litter or sanitation to be a problem and few consider these to be moderate or big problems. As shown in Table E5.2.3-33, 56 percent of Lake Almanor respondents and 71 percent of Butt Valley Reservoir respondents felt shoreline litter was not a problem.

Table E5.2.3-33
Perceptions of Problems: Resource Conditions

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.
N/A=Not Applicable/No Answer; 1=Not a Problem; 2=A Slight Problem; 3=A Moderate Problem; 4=A Big Problem

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)				
	N/A	1	2	3	4	N/A	1	2	3	4
Litter around the lake shoreline	9	56	26	8	1	2	71	18	6	3
Sanitation around the lake shoreline	12	61	18	6	3	5	73	13	6	3
Water level fluctuations	12	28	19	20	22	7	42	33	11	8
Exposed land during lower water levels	9	23	24	20	23	8	55	24	5	7
Shallow areas during lower water levels	11	24	23	20	22	7	55	26	5	7
Floating debris in the water	10	55	25	8	2	5	64	20	7	4
Inundated areas during high water levels	27	61	10	1	1	3	89	7	2	—
Quality of water in lake	11	74	11	3	2	15	68	9	4	4

Source: EDAW, Inc.

Results also indicate that 26 and 18 percent at each location considered this to be only a slight problem. Similar percentages considered sanitation to be either a slight problem or not a problem. Nine percent of visitors at each location considered these to be moderate or big problems.

Resource Conditions Related to Water Level Fluctuation

Although they do not comprise a majority, the survey results indicate that water level fluctuation and some associated conditions are of at least moderate concern to many boaters at Lake Almanor. Overall water level fluctuations and exposed land and shallows present during lower water levels were each considered "a big problem" by 22–23 percent of respondents and "a moderate problem" by 20 percent of respondents. In comparison, only 23–28 percent considered these to be "not a problem." It should also be acknowledged that the 2001 survey took place during drought conditions and the California energy crisis; thus, reservoir pool level was at a comparatively lower level during much of the survey. Inundation of areas during high water levels and the associated problem of floating debris in the water were of less concern with 61 and 55 percent, respectively, considering these to be not a problem. Twenty-five percent considered floating debris a slight problem.

These issues were of less concern to Butt Valley Reservoir boaters, although of greater concern than many other issues addressed on the questionnaire. Nineteen percent considered water level fluctuations a moderate or big problem at Butt Valley Reservoir, while one-third considered it a slight problem. Fifty-five percent exposed land and shallow areas during low water levels to not be a problem, while about one-fourth considered these slight problems. Eighty-nine percent considered inundation of areas during high water levels to not be a problem. Sixty-four percent were unconcerned about floating debris in the water, while 20 percent considered it a slight problem.

Water Quality

Visitors to both reservoirs indicated little concern about the quality of water in the reservoirs. Seventy-four percent at Lake Almanor and 68 percent at Butt Valley Reservoir considered water quality to be not a problem. Just 5 percent of respondents at Lake Almanor and 8 percent at Butt Valley Reservoir considered water quality to be a moderate or big problem.

E5.2.3.4.4.5 Perceptions of Reservoir Management and Facilities

This final section discussing boaters' perceptions focuses on the extent to which they consider several management and facility-related issues to be a problem, on their evaluation of current boating-related facilities and services, and their opinions on potential improvements to those facilities and services.

Perceptions of Problems Related to Reservoir Management and Facilities

Few Lake Almanor boaters considered there to be more than a slight problem with their ability to launch a boat or watercraft on the reservoir. More than half the respondents said this was "not a problem" and one-quarter responded N/A, meaning they do not launch boats on the reservoir (see Table E5.2.3-34). Ten percent considered this a slight problem, and 10 percent considered it a moderate or big problem. These latter respondents may have been reacting to launching problems caused by the comparatively low water conditions prevalent during the 2001 boating season, in particular later in the season.

Few Butt Valley Reservoir boaters indicated they had a concern with their ability to launch boats, with two-thirds indicating this was not a problem, and just 6 percent responding that it was a moderate or big problem.

Table E5.2.3-34
Perceptions Management and Facility Problems

SURVEY QUESTION: The following section lists things you might or might not have experienced at this recreation area. For each item below, indicate how much of a problem you think it is.

N/A=Not Applicable/No Answer; 1=Not a Problem; 2=A Slight Problem; 3=A Moderate Problem; 4=A Big Problem

Items	Lake Almanor (percent)					Butt Valley Reservoir (percent)				
	N/A	1	2	3	4	N/A	1	2	3	4
Ability to launch a boat or watercraft	25	54	10	6	4	20	66	8	5	1
Development on or near the shoreline	15	52	17	12	4	19	74	3	2	2
Boat-in use of the undeveloped shoreline areas	34	55	7	3	1	30	65	3	2	1
Amount of private residents' ownership of the shoreline	18	49	16	12	5	Item not included				

Note: "Item not included" indicates that item was deleted from the questionnaire for that resource area

Source: EDAW, Inc.

Regarding shoreline development and use, most Lake Almanor and Butt Valley Reservoir respondents did not consider development on or near the shoreline, boat-in use of undeveloped shoreline areas, or the amount of private ownership of the shoreline to be a problem. About one-half of Lake Almanor respondents, and two-thirds to three-fourths of Butt Valley Reservoir respondents, felt these issues were not a problem (the issue of private ownership did not apply to Butt Valley Reservoir). However, 17 percent of Lake Almanor respondents considered shoreline development a slight problem, and 16 percent considered it a moderate or big problem. Similarly, 16 percent considered private shoreline ownership a slight problem and 17 percent considered it a moderate or big problem.

Opinions on Potential Improvements in Facilities and Services

Mail-back survey participants were also asked to indicate their opinions on potential improvements in facilities and services in the Project area. Several of the items on the survey were boating-related, and these have been included in Table E5.2.3-35 below. Overall, Lake Almanor visitors were roughly neutral in their support for no-wake zones, and more day use and overnight moorage facilities. However, nearly one-half of respondents indicated some support for no-wake zones and 39 percent indicated they supported more day use facilities, while a comparatively low 21 percent supported development of more overnight moorage docks. No-wake zones already exist by county ordinance, so perhaps a lack of enforcement or knowledge of the existing no-wake zones could have produced this response rate (46 percent).

Table E5.2.3-35
Visitors' Opinions of Possible Boating-Related Developments

SURVEY QUESTION: How much do you support or oppose each of the following possible developments at this recreation area?

-2=Strongly Oppose; -1=Somewhat Oppose; 0=Neutral; +1=Somewhat Support; +2=Strongly Support

Development	Lake Almanor		Butt Valley Reservoir	
	Mean Rating	Percent Support	Mean Rating	Percent Support
Create no-wake zones on the lake	3.4	46	3.2	35
Create more day use facilities around the lake	3.2	39	2.3	17
Create more commercial overnight moorage docks	2.9	21	1.9	11

Note: For purposes of data entry, the scale was revised such that 1=Strongly Oppose and 5=Strongly Support. Thus a mean rating of 3 would indicate an overall "neutral" opinion on an item. Percent support indicates responses of 4 or5 ("somewhat" or "strongly support").

Source: EDAW, Inc.

Butt Valley Reservoir visitors offered less support for these developments. Overall, support for no-wake zones was neutral, with about one-third of respondents indicating support.

Support was lacking for additional day use or overnight moorage facilities at Butt Valley Reservoir, with these proposals receiving only 17 percent and 11 percent support, respectively.

Evaluation of Current Boating-Related Facilities and Services

Visitors' evaluations of existing boating-related facilities using a 5-point scale have been provided in Table E5.2.3-36. (Lake Almanor responses are in order by mean rating.) Overall, visitors at both locations indicated that the level of facility development falls between "about right" (3 on the scale) and somewhat "too low" (4 on the scale) with all items receiving a mean rating of between three and four.

Table E5.2.3-36
Visitors' Evaluation of Current Boating-Related Developments and Services

SURVEY QUESTION: How do you evaluate the number or amount of each of the following developments or services at this recreation area?

1=Too High;3=About Right; 5=Too Low

Development	Lake Almanor		Butt Valley Reservoir	
	Mean Rating	Percent	Mean Rating	Percent
Fish cleaning stations	3.8	50	4	62
Number of restrooms around the shoreline	3.7	47	3.3	20
Amount of parking along roads	3.7	43	3.4	28
Boat-in primitive campsites	3.7	50	3.7	48
Number of docks or temporary moorage	3.6	42	3.4	21
Amount of public access areas on shoreline	3.6	38	3.3	23
No. of developed day-use or picnic areas around the shore	3.6	41	3.3	26
Boat-in gas stations	3.6	44	Item not included	
Number of boat ramps	3.5	34	3.2	14
Number of boat-in campsites	3.5	37	3.3	22
Law enforcement presence	3.5	36	3.4	29
Number of marinas	3.4	32	Item not included	

Note: Percent columns indicate responses of 4 or 5 (i.e., on the "Too Low" side of the scale). Mean ratings and percents do not include N/A responses and non-responses. "Item not included" indicates that item was deleted from the questionnaire for that resource area.

Source: EDAW, Inc.

Fish cleaning stations received the highest mean rating (i.e., highest number of "too low" responses) at both locations. Some differentiation of opinion regarding specific types of development and services is apparent in the percentage of respondents rating the number or amount provided as too low (a 4 or more emphatic 5 on the scale). About half to over 60 percent of respondents at both locations considered fish cleaning stations and boat-in primitive campsites to be in too low of a supply. Nearly one-half of respondents at Lake Almanor considered the number of restrooms near the shoreline to be to low. In contrast, only about one-third considered the number of boat ramps and marinas to be too low.

In general, much lower percentages of Butt Valley Reservoir respondents considered the listed types of facilities and services to be underprovided. Aside from fish cleaning stations and boat-in primitive campsites, less than 30 percent considered the number or amount of the listed facilities and services to be too low.

E5.2.3.4.4.6 Boater Group Characteristics

Of the 1,378 visitors contacted during the 2001 on-site visitor survey, 681 (49 percent) were identified as boaters. A respondent was considered a boater if they indicated that they or members of their group participated in any of the following activities: motorboating, waterskiing, PWC use, sailing, kayaking, canoeing, and windsurfing. Fifty-seven percent of the respondents contacted at Lake Almanor, 53 percent of those contacted at Butt Valley Reservoir, and 3 percent of those contacted at Belden Reach were boaters.

The following section uses the on-site survey data to characterize this subset of visitors across all three resource areas in terms of group size, participation in various boating activities, self-described primary activity, and length of stay.

Group Size

Group size among boaters ranged from one to 70, but most groups were comprised of six or fewer people. Although the mean group size was over 10 people, this value was inflated by the presence of a relatively small number of groups of 50 or more. The median group size was six. About 2 percent were solitary visitors, about 47 percent were in groups of two to five, about 25 percent were in groups of six to 10, and the remaining 26 percent were in larger groups.

Primary Activities

Survey participants had the opportunity to indicate participation in the seven boating-related activities listed above, among a list of 22 activities. Sixty-nine percent of boaters participated in motorboating during their visit, and 48 percent participated in waterskiing. Participation in PWC-use and non-powered boating was considerably lower with 22 percent canoeing, 12 percent kayaking, 11 percent PWC-riding, 8 percent sailing, and 4 percent windsurfing.

When these respondents were asked to indicate their primary activity, the top four activities did not include these boating activities. Fishing (which visitors may have done from a boat) was mentioned most often (by 17 percent of respondents).

Tent camping, swimming (also potentially done from a boat), and RV camping were the next three most frequent responses. Motorboating ranked fifth and waterskiing sixth, but only 10 and 9 percent, respectively, listed those activities as their primary activity.

Length of Stay

Over 90 percent of respondents provided the date of their arrival and planned departure from the Project area, allowing calculations of lengths of stays. Slightly more than 8 percent were 1-day visitors, while about 92 percent were multiple day visitors. Approximately 44 percent were staying in the area from 2 to 4 days and around 37 percent were staying from 5 to 10 days. As for lengthier visits, slightly less than 9 percent were between 11 and 20 days, and the remaining 2 percent were longer than 20 days. The average length of stay if all responses are included in the calculation is 7.1 days. However, if the 18 respondents who were visiting longer than 30 days (the range in this group was 60 to 180 days) the average length of stay falls to a more representative 5.5 days.

E5.2.3.4.5 Estimates of Surface Water Boating Capacity

Assessment of the four types of recreation capacity—ecological, physical/spatial, facility, and social—were conducted for each Project area reservoir. Information for ecological capacity assessment was obtained from data collected as part of the Facility Condition and Inventory Study (see Section E5.1.2) and the Recreation Suitability Analysis study (see Section E5.2.7).

Information for the physical/spatial component of this capacity analysis is drawn from the observational data collected during the on-water boating use estimation component. Information on facilities utilization was collected during the Existing Recreation Use Study (see Section E5.2.2), and also from the Questionnaire Survey (see Section E5.2.1). Information on the social capacity of Project reservoirs was also collected as part of the recreation survey.

The emphasis when drawing on use observation and survey data, where possible, is on data representing peak period (i.e., summer and holiday) use conditions and perceptions. Data that represent non-peak use and perceptions may obscure impacts most pertinent to capacity limits, which are most likely to come into play during peak use times. Peak use times are also when a high percentage of overall project recreational use occurs. Therefore, recreation conditions at those times most closely approximate what the majority of recreational users experience. Results from this analysis are presented below.

E5.2.3.4.5.1 Lake Almanor Surface Water Boating Capacity

This section considers the capacity of Lake Almanor in terms of the four types of capacity described above, first for the reservoir as a whole and then by segment. It concludes with a review of each segment's overall capacity status taking into account all four types of capacity.

Lake Almanor Ecological Capacity Issues

Assessments of ecological capacity are addressed in the Recreation Carrying Capacity Study (see Section E5.2.5). However, portions of the study are primarily concerned with ecological impacts connected to recreation on land. Potential impacts relating to boating at Project reservoirs include watercraft traffic and the resulting noise and wakes, litter and waste, water quality reduction, wave or user-caused shoreline erosion, and wildlife or wildlife habitat disturbance. Visitor perceptions of ecological impacts at Project area reservoirs also provide insight into this area, although it cannot be assumed that visitors will have awareness of all potential impacts or of their consequences. While information in Section E5.2.5 indicates that ecological carrying capacity at Lake Almanor is a limiting factor on a site level, it concludes that is not considered a limiting factor for Lake Almanor as a whole.

It is important to point out the difficulty in directly linking the level of boating activity with ecological impacts. The specific nature and location of boating activity may have great influence on the degree of impact caused. Further, a majority of some types of ecological impacts may occur at low levels of use with additional use having little affect in terms of additional impact. For these reasons, it is also difficult to formulate specific boating capacity limits based on ecological factors. Nevertheless, ecological capacity may be considered exceeded when a significant degree of undesirable ecological change is observed to be occurring that can be attributed to recreational activity.

Canyon Dam Boat Launch/DUA was the only boating-related site identified as having ecological impact concerns at Lake Almanor, with shoreline erosion occurring in the cove area adjacent to the site. This was occurring due to shoreline use by visitors. Wave-induced erosion was identified at other sites along the shore of Lake Almanor, most notably along the east shore. Researcher observation suggests that this erosion is primarily a result of waves pushed by the prevailing winds, which most affect that side of the reservoir. It was noted that areas of the most extensive erosion occur where researchers observed little boat traffic.

Visitor perceptions of ecological impacts along Lake Almanor shorelines were addressed in the mail-back survey questionnaire in which participants were asked to review a list of problems they may have encountered during their visit to the area. Visitors were asked about litter and sanitation around the reservoir shoreline, as well as their impression of the lake's water quality.

As discussed in Section E5.2.3.4.4.4, these type of impacts were not considered to be a problem by most visitors at Lake Almanor and few considered them to be more than slight problems. Just 8 percent said litter was a moderate problem, and 1 percent rated it as a big problem, while a similar 9 percent considered sanitation around the shoreline a moderate or big problem. An even lower 5 percent considered the reservoir's water quality a moderate or big problem.

Several types of biological data were collected and analyzed for a recreation development suitability analysis at Lake Almanor (see Section E5.2.6). These include the presence of wetlands and riparian vegetation, special status (rare or endangered) plants, and eagle, osprey or heron nests. Each of these can be reviewed for application to surface water boating capacity by noting their presence on or very near the shoreline of each segment. Buffers were applied to each of these biological features for the purpose of determining development constraint; these can be applied in a similar way to the reservoir surface as zones from which recreational boating and associated shoreline use might be excluded, i.e., as an ecologically-limiting factor. Buffer zones for eagle nests extend to from 0.25 to 0.5 mile, with the highest level of restriction within 0.25 mile. For osprey and heron nests, the zone extends 600 feet, for special status plants 500 feet, and for wetlands and riparian areas 250 feet. Due to the broad, open water character of Lake Almanor (the two main lobes of the lake are 4 to 5 miles-wide) and the typical drop in water level each season, buffer areas associated with shoreline features would be expected to have little impact on surface water use.

Six eagle nests that are located within 0.5 mile of the shoreline of Lake Almanor have been identified. Two of these are within 0.25 mile of the shoreline when the reservoir is at full pool, one on the east shore of Segment B, and one near the southern end of the reservoir (Segment D). Osprey nests are considerably more numerous, with 64 identified within 0.5 mile of shore. Several are in residential or recreation development areas such as Lake Almanor Country Club, Prattville, and Almanor Campground.

Many of these nest sites are on or very close to the shoreline at full pool, but the water surface would be outside the 600-foot buffer as the pool level dropped for those that are some distance inland.

Most occurrences of special status plants are within Segment A, the shallow cove of Lake Almanor north of the SR 36 causeway that was not boatable during the 2001 season. (These are primarily located some distance from open water, even at full pool, within marsh areas.) A few populations of the plant *Clarkia stellata* have been identified near the western shore of the reservoir (within Segments B and D). On-water exclusionary zones would not likely enhance protection of these populations. (Other measures to prevent shoreline use by boaters in those areas may be appropriate.)

Wetland and riparian areas are also primarily located within Segment A, and along the shallowly sloping northwest shore of Segment B near the town of Chester. These areas are either shallow or entirely inaccessible to powerboats at pool elevations below full pool, and so boating activity within the 250-foot buffer area would be expected to be light or non-existent. In summary, it does not appear that ecological factors are limiting to boating capacity at Lake Almanor in any segment. Sensitive shoreline features are typically scattered in their distribution or are situated such that any exclusionary areas to protect them from recreational activity would have little impact on boating capacity.

Lake Almanor Facility Capacity Issues

During lower water years, a potentially limiting capacity factor at the two public boat launches at Lake Almanor is the availability of launch facilities with sufficient water depth during periods of low pool, such as that experienced during 2001. The Almanor Boat Launch is currently usable down to 4,481-ft elevation and the Canyon Dam Boat Launch/DUA is usable down to 4,478-ft elevation. Licensee proposes to extend one lane of the Canyon Dam Boat Launch/DUA ramp to the 4,466-ft elevation. In addition, some of the commercial boat ramps around Lake Almanor also provide access to lower lake elevations, since they were constructed prior to Licensee raising the reservoir to the 4,494-ft elevation.

Facility occupancy levels related to boating at Lake Almanor are focused on observations of utilization at the reservoir's boat launch parking areas (see Section E5.2.5—Recreation Carrying Capacity Analysis). Seasonal utilization at the two public boat ramps at Lake Almanor is high, with a combined seasonal occupancy rate of 81 percent. The season average occupancy at Canyon Dam Boat Launch/DUA is 99 percent, while at Almanor Boat Launch occupancy averages 49 percent. However, during 2001 peak months facility utilization increased. Capacity was exceeded at Canyon Dam Boat Launch/DUA (113 percent utilization), and utilization increased to 51 percent at Almanor Boat Launch.

Greater than 100 percent use rates at Canyon Dam Boat Launch/DUA is likely a result of occupancy rates measured during the later part of the 2001 season when Almanor Boat Launch was no longer usable. During years of normal lake levels, parking occupancy

rates would likely not exceed capacity at Canyon Dam to the same level as during 2001. Therefore, facility capacity as it relates to parking can be a limiting factor at public boat launches, but is likely limited to the later part of the lower water season.

Another factor in facility capacity is private facilities, which inventory and boating activity estimation results suggest contribute a large portion of boat traffic. There are over 400 private docks and over 500 mooring buoys under permit by the Licensee. However, many of these appeared to be unused during the 2001 season, suggesting that capacity is not close to being exceeded for these types of facilities. This conclusion is based on the observations that the number of empty docks was typically much greater than the number of active boats on the water, some of which would have originated at public launches. Therefore, even with the assumption that some of the active boats observed had originated from private docks and mooring buoys, many of these facilities must have been unused at those times.

Facility issues were also addressed within the recreation survey questionnaire. Responding to a general question relating to the ease of finding convenient parking at Lake Almanor, 56 percent of visitors indicated that finding convenient parking was not a problem. Finding convenient parking was a slight problem for 20 percent, a moderate problem for 11 percent, and a big problem for 3 percent.

Most visitors indicated that launching a boat or PWC at Lake Almanor was not a problem. Launching a boat was a slight problem for 10 percent of visitors, a moderate problem for 6 percent, and a big problem for 4 percent.

The necessity for boaters to wait to launch can indicate that launching capacity is becoming a limiting factor. Yet, waiting times at boat launches were similarly not a problem for 56 percent of study participants, a slight problem for 11 percent, a moderate problem for 3 percent, and a big problem for 1 percent.

Lake Almanor Physical/Spatial Capacity Issues

Physical/spatial capacity concerns the actual area of lake surface needed to support a given amount of boating use of particular characteristics. Boating characteristics such as type of boats, boat speeds, prevalence of powered vs. non-powered craft, and boater behavior and activities (e.g., time boats spend cruising versus stationary while relaxing, swimming, or fishing) affect physical/spatial needs. Capacity limits are expressed in terms of particular boat or activity surface area needs, using published guidelines (see Section E5.2.3.4.2.1).

For this study, traffic counts and boat traffic density calculations apply to the entire reservoir and the reservoir segments, which are large areas of water (from 7.1 to 16.8 square-miles per segment at the lowest pool elevation of the 2001 season).

Thus, these data cannot provide indications of capacity limits being exceeded in more limited areas where use may be concentrated. Researchers observed that traffic tended to concentrate in near shore areas while boating activity remained comparatively low further out in open water.

Boat traffic density for the entire reservoir ranged from 122 to 626 surface acres available per boat over the 14 observations completed. This means that even at the highest traffic density, the area of water available per boat reservoir-wide was at least three times the most generous guideline of 40 acres per boat (recommended for boating activities such as PWC use and waterskiing). Using this guideline and the minimum surface area of Lake Almanor during the 2001 data collection season of 21,740 acres, there would be room for over 540 boats on the reservoir at that time, assuming all the surface area had sufficient depth. This is about three times the maximum observed use for the season. Obviously, then, the data indicate that reservoir-wide spatial capacity was not close to being reached at any point during the 2001 season.

Boat traffic density on Lake Almanor segments was greater at certain times than the reservoir-wide level that allowed 122 surface acres per boat, yet during all observations the space available greatly exceeded any guidelines. The acres available per boat on the western Segment B never fell below 138 acres. On the northeastern Segment C, acres per boat fell as low as 87 acres, on the Independence Day holiday.

On Segment D, in the vicinity of the dam and the lower basin, the minimum surface area available was 96 acres per boat. For Lake Almanor segments then, as for the reservoir as a whole, spatial capacity was not approached at any time during the 2001 season.

Lake Almanor Social Capacity Issues

Researcher observations of boat traffic can also provide some indication of social capacity problems. For example, observations on the reservoir during high-use periods indicate that problems associated with high density boat traffic can occur in the areas between the Almanor Peninsula and Prattville, where traffic en-route to marinas and resorts can mix with waterskiers and PWC users. The primary indications, however, of Project reservoirs' social carrying capacity is found in visitors' responses to survey items that measure the social experience of visitors to the Project area, such as perceptions of crowding and the incidence of recreation conflict between user groups experienced. These survey items are focused on measuring impacts to boaters' enjoyment of their recreational experience when using the reservoir.

It is not possible to say with certainty that social capacity has been exceeded at one particular use level, or degree of social impact. Rather, professional judgment might lead to a conclusion that social capacity is being approached if, for instance, one-third or more of visitors report crowding concerns, using a conservative standard, and exceeded if more than half of visitors report concern with crowding. A different standard might be applied that would require a higher percentage of respondents to express concern with crowding before social capacity was judged as being approached.

A judgment must also be made as to what constitutes a minimal level of "concern" about crowding. One option is to take into account the percentage who consider specific areas from "moderately" to "extremely" crowded (6 to 9 on the 9-point crowding scale used for this study).

As noted earlier in this report (see Table E5.2.3-28), 65–70 percent of Lake Almanor visitors reported little, if any, crowding. Those who did report crowding generally gave responses on the low end of the crowding scale (2 or 3 on the 9-point scale, 1 meaning "not at all crowded"). However, about 28 percent of boating visitors considered the resource area at least moderately crowded (6 or higher on the 9-point scale). Just 11 percent said the area was more crowded than they expected, suggesting most boaters are familiar with, and thus more accepting of, typical use levels. Regarding specific reservoir segments, 16, 18, and 22 percent considered Segments B, C, and D, respectively, at least moderately crowded.

Reports of conflict were also described earlier in this report, and overall suggested that great majority of Lake Almanor visitors experience general conflict (not specific to any user group) and more user group-specific varieties as only slight problems, if at all. The only user group-specific conflicts that more than 10 percent of Lake Almanor respondents considered moderate or big problems were noise from boats and PWC (12 percent) and interactions between PWC and other users (19 percent).

The minority of reports of conflicts as "moderate" or "big" problems may indicate that social thresholds for capacity are approaching problem levels during high-use periods or periods when specific kinds of activities, such as PWC use, or combinations of use are prevalent.

Taking both conflict and crowding results into account, at this time social carrying capacity cannot be said to be a limiting factor for Lake Almanor as a whole, or on any specific reservoir segments.

Overall Capacity for Lake Almanor and Limiting Factors

The discussion of the four types of capacity as they relate to Lake Almanor is facilitated by placing data into a matrix (see Table E5.2.3-37) and evaluating the status of each reservoir segment in terms of what appears to be the most limiting type of capacity. Status is expressed for each segment as below, approaching, at, or exceeding capacity.

For Lake Almanor Segments B and D, only facilities appear to be approaching capacity. This conclusion applies only to public facilities at peak use times, due to heavy use of public launch areas at those times. For Segment C, where no public facilities exist, none of the four types of capacity appear to be approaching limits. As stated previously, social capacity may be approaching limits in more limited areas within segments, but the data collected does not provide sufficient information to confirm this.

Given the current status of each type of capacity, it would be expected that facility capacity would become a limiting factor in boating capacity if use increased such that the public launches were used to capacity at most peak use times (i.e., summer weekends). Social capacity might also become a limiting factor, if perceptions and concerns related to crowding and conflict increased such that one-third to one-half of boaters were

affected. Physical and ecological capacities seem unlikely to become factors, even with increased boating use, given the excess capacity that appears to exist at present.

Table E5.2.3-37
Summary of Existing Boating Capacity at Lake Almanor

Area	Capacity Type	Capacity Summary[1]
Segment A	No data	No data
Segment B	Ecological Physical/Spatial Facility (public and private) Social	Below Below Approaching (during peak use periods) Below
Segment C	Ecological Physical/Spatial Facility (private) Social	Below Below Below Below
Segment D	Ecological Physical/Spatial Facility (public and private) Social	Below Below Approaching (during peak use periods) Below

[1] *Indicates whether current use is below, approaching, at, or exceeding capacity.*

Source: EDAW, Inc.

E5.2.3.4.5.2 Lake Almanor Boating Capacity at Four Significant Pool Levels

As 2001 was a comparatively low water level year, boating capacity was also assessed over the full range of reservoir elevations that are experienced at Lake Almanor, including two intermediate elevations of particular interest. Specifically, boating capacity issues at pool elevations of 4,494, 4,485, 4,474, and 4,467 feet were assessed. The 4,494-foot level is the California Division of Safety of Dams' maximum allowable pool level. The 4,467-foot level approximates the Licensee's minimum operational elevation goal.

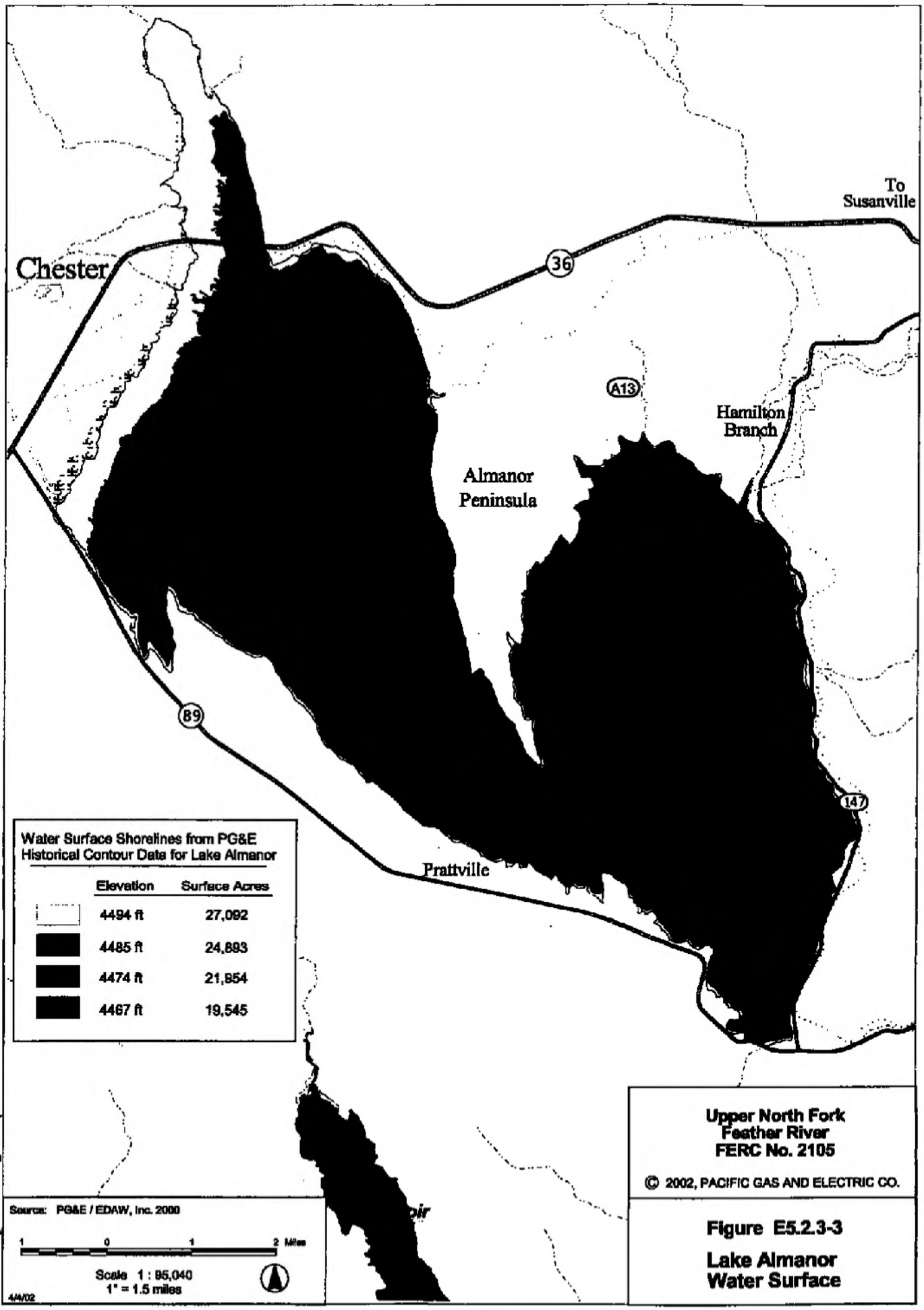
To describe the effects that the progressively lower reservoir levels have on Lake Almanor's shoreline and surface area, historic bathymetric data from a 1927 survey of Lake Almanor (Licensee 2000b) was combined with GIS technology to produce a map depicting the reservoir at each pool elevation (see Figure E5.2.3-3).

These pool levels encompass levels considerably above and below those that existed during the May to October 2001 data collection season. Reservoir elevation peaked for the season (and the year) at just over 4,480 feet in late May and fell to about 4,473 feet by the end of data collection on October 13. (The pool level continued to fall until November 9, when the 2001 low of 4,471.8 feet was recorded.) Therefore, the 4,494 maximum pool and 4,485-foot median high pool level are 14 feet and 5 feet, respectively, above the 2001 season maximum. The 4,474-foot mean low level is close to the 2001 season's minimum reservoir elevation, while the 4,467-foot minimum pool is about 6 feet lower.

Physical Capacity

Physical capacity, i.e., the actual surface area available for boats, can be addressed by comparing observed boat traffic densities with those that would exist at the four pool levels at the observed level of use.

Table E5.2.3-38 compares boat traffic density on the 2 days when the maximum of 183 boats were observed (both holidays) with the boat traffic density that would have existed with 183 boats present at the four elevations of interest. Obviously, the surface area



available decreases as the reservoir level falls and the number of acres available per boat will decrease for a given use level.

Table E5.2.3-38
Comparison of Lake Almanor Surface Acres per Boat at Peak Use

Elevation (feet)	Surface Acres[a]	Boats Observed	Acres per Boat
2001 Maximum Boat Traffic Observations			
4,478.9 (July 4)	23,315	183	127
4,475.3 (Sept 1)	22,346	183	122
Four Pool Elevations of Significance			
4,494	27,092	183[b]	148
4,485	24,893	183[b]	136
4,474	21,954	183[b]	120
4,467	19,545	183[b]	107

[a]Surface acre figures are based on reservoir volume data and conversion tables provided by the Licensee.

[b]The figure of 183 boats is used here for comparison purposes only and does not represent any actual observations for the four elevations of significance.

Source: EDAW, Inc.

There were between 122 and 127 acres available per boat during the 2 peak use days in 2001. A similar boat traffic density would have existed at the 4,474-foot median low pool, and a somewhat low density would have existed at the median high pool of 4,485 feet. The additional 9 feet of elevation translates to 148 surface acres available per boat at the maximum pool of 4,494 feet. Even at the minimum pool of 4,467 feet, over 106 acres would have been available per boat at the maximum observed use level.

Facility Capacity

Facility capacity at these pool levels can be addressed by reviewing data on the usability of the two public launch ramps at those levels. This can be supplemented with

observations of the usability of private launch ramps, docks, and mooring buoys at each level.

The Almanor Boat Launch is usable down to the 4,481-foot elevation, and the Canyon Dam Boat Launch/DUA is usable down to the 4,478-foot elevation. These elevations account for the recommended 3 feet of water at the toe of the ramp.

Researchers noted during on-water observations of boats stored at private docks and mooring buoys, and beached that many docks, buoys and beaching sites become unusable at elevations below about 4,475 feet. At the end of the data collection season in mid-October 2001 the lake elevation was approximately 4,474 feet and it was observed that about one-third to one-half of docks and mooring buoys were out of the water. However, at this late date in the boating season, it is likely that most boat owners were done boating and no longer needed their docks and/or mooring buoys in the water.

Ecological Capacity

Ecological capacity is less directly associated with pool levels than physical or facility capacity, therefore estimates of hypothetical capacity are more tenuous.

Ecological capacity as determined by the amount of shoreline sensitive to recreational use (due to the presence of wetlands, riparian areas, or special status plants) may vary little at Lake Almanor given that the additional land exposed as the pool level drops is small except at the northwest shoreline. In that area, it would appear that the wide area of

reservoir bottom exposed as the reservoir level falls receives little use from land or water based lake users. The area is essentially a mud flat that is re-inundated each winter as the reservoir is refilled. There are two dispersed use sites in the area that provide shoreline access when the reservoir is at or near the mean high elevation of 4,485 feet. Falling reservoir pool levels would be expected to have the effect of reducing the potential for impacts on sensitive shoreline areas by boaters.

Impacts on wildlife are another type of ecological parameter that may be affected by changes in use levels. As discussed above, bald eagle and osprey nests are sensitive resources at Lake Almanor. However, like social capacity, the distribution and behavior of recreationists may have a greater affect on wildlife than simple numbers of people. A few recreationists coming too close to eagle nests or other wildlife or engaging in other behavior detrimental to wildlife may have more negative effect than an increase in overall use that does not result in more disturbance, habitat damage, etc. Overall, a presumption can be made that potential for disturbance of these nests located near the shoreline would decrease as the pool level falls and boats are kept further from the high pool shoreline. Increased boating use, particularly during morning and evening hours, may have an effect on eagles who also generally forage during these times, although current effects are not expected to be significant.

Social Capacity

Like ecological capacity, social capacity is only indirectly associated with pool levels and no direct or specific estimate of hypothetical capacity is possible. Social capacity may be

influenced by boat traffic density, which rises for a given amount of boat traffic as the pool level and associated lake surface area decreases. However, recreation research has repeatedly shown that use levels are only weakly associated with perceptions of crowding, one indicator that social capacity is being exceeded. Other factors such as the distribution, timing, type, and diversity of recreation activity and the behavior of recreationists (i.e., attention to courtesy and safety) are likely to have a greater affect on visitors perceptions of crowding and conflict. Further, the amount of surface acres in Segments C and D, the two most heavily used segments of Lake Almanor, change only slightly as the pool level falls due to steep shorelines.

E5.2.3.4.5.3 Butt Valley Reservoir Surface Water Boating Capacity

This section considers the capacity of Butt Valley Reservoir in a identical manner to Lake Almanor, with discussion of the four types of capacity described above. It concludes with a review of the reservoir's overall capacity status taking into account all four types of capacity.

Butt Valley Reservoir Ecological Capacity Issues

Assessments of ecological capacity at Butt Valley Reservoir are addressed in Section E5.2.5—Recreation Carrying Capacity Study. Visitor perceptions of ecological impacts also provide insight into this area at Project reservoirs.

The ecological carrying capacity analysis of Butt Valley Reservoir concluded that ecological capacity was not a limiting factor on the site level. While researchers noted

erosion of the shoreline on the east shore of the reservoir, it was determined that prevailing winds were more likely the cause rather than recreation-related factors, particularly since boat traffic on the reservoir is low and speeds are limited to 25 mph.

Ecological impacts along shorelines were included in a question on the visitor survey in which questionnaire participants were asked to review a list of potential problems encountered as part of their visit to the area. Butt Valley Reservoir visitors were asked about litter and sanitation around the lake shoreline, as well as their impression of the reservoir's water quality.

Ecological impacts were not considered a problem by most visitors to Butt Valley Reservoir. A large majority (71 percent) of Butt Valley Reservoir mail-back survey participants indicated that litter along the shoreline of the reservoir was not a problem, while 18 percent indicated that it was a slight problem. Six percent said litter was a moderate problem, and 3 percent rated it as a big problem. Sanitation around the shoreline was not a problem for 73 percent of mail-back survey participants, and a slight problem for 13 percent. Sixty-eight percent of visitors felt the reservoir's water quality was not a problem, while 9 percent considered it a slight problem. Four percent indicated that it was a moderate problem and 4 percent said it was a big problem.

As at Lake Almanor, several types of biological data were collected and analyzed for a recreation development suitability analysis at Butt Valley Reservoir (see Section E5.2.6). These include the presence of wetlands and riparian vegetation, special status (rare or

endangered) plants, and eagle, osprey or heron nests. Here also, each of these can be reviewed for application to surface water boating capacity by noting their presence on or very near the shoreline. Buffers were applied to each of these biological features for the purpose of determining development constraint; these can be applied in a similar way to the reservoir surface as zones from which recreational boating and associated shoreline use might be excluded, i.e., as an ecologically-limiting factor. Buffer zones for eagle nests extend from 0.25 to 0.5 mile, for osprey and heron nests 600 feet, for special status plants 500 feet, and for wetlands and riparian areas 250 feet.

Two eagle nests located about 0.25 mile of the shoreline of Butt Valley Reservoir have been identified, both near the west shore. Another nest is about 0.5 mile from the east shore. No osprey nests were identified within 0.5 mile of the reservoir. Considering that boating use is relatively light on the reservoir, potential boating disturbances to foraging is currently expected to be light.

Several occurrences of special status plants have been identified on both the east and west shores. Most are populations of the plant *Clarkia stellata*, which exist in about two dozen locations on both shores. Also, several populations have been identified of the plant *Lupinas dalesiae*, primarily on the east shore. On-water exclusionary zones would not likely enhance protection of these populations. (Other measures to prevent shoreline use by boaters in those areas may be appropriate.)

Wetland and riparian areas are primarily located at the northern end of the reservoir, where the creek feeds into the reservoir. Although pool fluctuation is less a factor here than at Lake Almanor, this areas is less accessible to boats at lower pool elevations. Boating activity within the 250-foot buffer area would be expected to be light. Ponderosa Flat Campground is near this area, but no launching facilities exist there. However, much of the boating activity on Butt Valley Reservoir consists of boaters in paddle-powered craft and these launches likely occur at Ponderosa Flat. It may be beneficial to discourage these boaters from launching or beaching in wetland areas.

In sum, it does not appear that ecological factors are limiting factors for boating capacity at Butt Valley Reservoir. Eagle nests, which require the greatest exclusionary zones, are few in number and are 0.25 mile or more from shore, reducing the chance of disturbance by boaters. No osprey nests are known to be present. Eagle foraging disturbances are expected to be slight. Other shoreline features such as sensitive vegetation are more numerous but would not likely benefit from exclusionary zones on the water.

Butt Valley Reservoir Facility Capacity Issues

Facility occupancy levels related to boating at Butt Valley Reservoir are focused on observations of utilization at the reservoir's boat ramp parking areas (see Section E5.2.5). Seasonal utilization at Alder Creek, the single public boat ramp at Butt Valley Reservoir, is considered to be exceeding capacity with an occupancy rate of 69 percent. During peak months, facility utilization decreases slightly to 64 percent.

Facility issues were also part of the recreation survey questionnaire completed by Butt Valley Reservoir visitors. Responding to a general question relating to the ease of finding convenient parking at Butt Valley Reservoir, 70 percent of visitors indicated that finding convenient parking was not a problem. Finding convenient parking was a slight problem for 12 percent, a moderate problem for 11 percent, and a big problem for 5 percent. Visitors indicated that they had little problem with launching a boat or PWC there. Launching a boat was a slight problem for 8 percent of visitors, a moderate problem for 1 percent, and a big problem for 1 percent. Waiting times at boat launches were not a problem for 74 percent of study participants, a slight problem for 4 percent, and a moderate problem for 1 percent.

Public access provided to Butt Valley Reservoir is a limiting factor in boating capacity given that the Alder Creek DUA/Boat Ramp is currently exceeding its seasonal capacity.

Butt Valley Reservoir Physical/Spatial Capacity Issues

A maximum of 10 boats was counted on Butt Valley Reservoir at any one time during counts conducted from the shore. Even if this count is considerably lower than actual peak use, the density of boat traffic on the approximately 1,500 acres of water would be low enough to provide 75 to 100 acres of water per boat. (This takes into consideration the exclusion of boats from the approximately 0.5 mile of water above the dam.) Thus, physical or spatial capacity is not likely to be a limiting factor on Butt Valley Reservoir.

Butt Valley Reservoir Social Capacity Issues

Fewer visitors at Butt Valley Reservoir reported feeling crowded than those at Lake Almanor, with 63 percent reporting little, if any, crowding (see Table E5.2.3-28). Those who did report crowding were on the moderate end of the crowding scale. Reports of conflict by visitors at Butt Valley Reservoir were also fewer than at Lake Almanor, with findings indicating that 85 percent of visitors considering conflicts not to be a problem, and 9 percent considering conflicts to be as slight problem. This lower level of concern about conflicts is expected given the less diverse use on Butt Valley Reservoir and restrictions on boat speed.

There appears to be some concern about crowding on the part of Butt Valley Reservoir boaters, but this may be more associated with conditions other than boating conditions. Twenty-five percent said they considered the Butt Valley Reservoir area to be moderately crowded, and another 14 percent considered it more than moderately crowded. In addition, 22 percent said the area was more crowded than they expected. Yet, when those who spent time boating were asked how crowded they perceived the reservoir to be, only about 20 percent considered it moderately crowded or worse (about half as many as who felt this way about the resource area as a whole).

Because of relatively little crowding or conflict reported by boaters, social carrying capacity is not judged to be a limiting factor for boating capacity at Butt Valley Reservoir.

Butt Valley Reservoir Overall Capacity

As depicted in Table E5.2.3-39, only one of the four types of capacity, facility, can be considered to be approaching capacity limits at Butt Valley Reservoir. The types of boating use are restricted and the amount of use was observed to be low at all times, due in part to the single boat launch provided. Facility capacity is a limiting factor based on parking area utilization at Alder Creek DUA/Boat Launch. Ecological, spatial, and social capacity seem unlikely to become limiting factors, even were use to increase, given what appears to be excess capacity at present.

Table E5.2.3-39
Summary of Existing Boating Capacity at Butt Valley Reservoir

Area	Capacity Type	Capacity Summary[1]
Butt Valley Reservoir	Ecological	Below
	Physical/Spatial	Below
	Facility (public)	Exceeding
	Social	Below

[1]Indicates whether current use is below, approaching, at, or exceeding capacity.

Source: EDAW, Inc.

E5.2.3.5 Conclusions

This section summarizes previous discussions regarding boating activity and boating conditions on Project area reservoirs, and provides recommendations for future monitoring and management of boating to enhance and preserve the quality boating recreational opportunities currently being provided.

E5.2.3.5.1 Summary

Boating Infrastructure

Boating infrastructure at present appears to be inadequate to meet current demand at both Project area reservoirs.

Canyon Dam Boat Launch/DUA and Alder Creek DUA/Boat Launch were used at or above capacity. Repairs and upgrades are planned for the near future for some of these facilities. Some restriction on public boating access to Lake Almanor exists due to the inadequate length of public ramps to serve users at low water conditions. Numerous private docks and mooring buoys are currently in place and under permit by the Licensee on Lake Almanor. It is not apparent that these facilities are fully used at present as many were observed to be vacant during the 2001 boating season. Over 800 marina and resort slips are also made available to the public by commercial operations, most of which support a high level of occupancy during the peak season.

Boating Use Levels

The boating use levels of Lake Almanor appear to be moderate, including during peak use weekends and holidays, given the large surface acreage available for boating that is present even when the reservoir is drawndown considerably. No more than 183 boats actively in use were observed at any time, and boat traffic density rarely exceeded .01 boats per acre (equivalent to 100 surface acres available per boat). Considerably more boats were observed at private docks and mooring buoys and beached on the shore near private homes. Distribution of boating activity was found to be similar among the three main segments of the reservoir, although Segment C (the northeastern lobe of the reservoir) received the most boat traffic during 13 of the 14 observation periods conducted. Several types of boats are likely to be active on the water at most times, but powerboats (including fishing and pleasure boats) and PWC dominate. Paddle-powered boats and sailboats are present in lesser numbers, in particular during the peak use season.

Boaters' Perceptions of Project Area Reservoirs

Around one-third of boaters considered each segment of Lake Almanor to be not at all crowded, while around another third considered them slightly crowded. Around 20 percent considered each segment moderately crowded, while 5 percent of fewer considered them extremely crowded or close to that level. Perceptions of on-water crowding were similar at Butt Valley Reservoir, with slightly more considering the reservoir not at all crowded and fewer considering it moderately crowded.

Less than 12 percent of boaters on either Project area reservoir considered user conflicts due to boat noise, speed, wakes, behavior, or other interactions to be more than a slight problem. One exception was the 19 percent of Lake Almanor boaters who considered interaction with PWCs to be a moderate problem (13 percent) or a big problem (6 percent).

Few boaters on either Project area reservoir consider the ability to launch a boat, or shoreline development and use to be a problem, or at worst, more than a slight problem. Boaters at either location did not express majority support for any of three recreational developments proposed on the mail survey questionnaire: creation of no-wake zones and additional day use and overnight moorage facilities. From around one-third to one-half of Lake Almanor boaters felt the amount of various boating-related developments and services currently provided were to low, with the highest percentages voicing this opinion about fish cleaning stations, restrooms near shore, and boat-in primitive campsites.

Less than 30 percent of Butt Valley Reservoir respondents expressed similar opinions about most of these development and services, with the exception of fish cleaning stations and boat-in primitive campsites (62 percent and 48 percent, respectively, consider the number provided to be too low).

Finally, during the comparatively low water year in 2001, over 40 percent of Lake Almanor boaters considered the water level to be moderately or totally unacceptable in terms of its affect on their enjoyment; about one-third felt that way in reference to its affect on recreation safety. Only one Lake Almanor boating accident was reported to Cal Boating, which is generally less than most years. Butt Valley Reservoir boaters' concerns about water level were much lower, with 13 percent considering water levels unacceptable in terms of affects on enjoyment and 9 percent rating the water level unacceptable in terms of safety.

Surface Water Boating Capacity

Boating use levels cannot be said to be approaching capacity at most times at either Lake Almanor or Butt Valley Reservoir. This conclusion takes into account potential limiting factors related to ecological capacity, spatial capacity, facility capacity, and social capacity. Public launching capacity was found to be exceeded during seasonal and peak month times at Lake Almanor, in particular when lower pool levels reduced or eliminated use of some public launch facilities.

Limitations of Existing Boating Data

It is appropriate to point out some limitations of the existing data as it relates to evaluation of boating use, conflicts, and carrying capacity.

First, there is a lack of data about site-specific use levels or other conditions at a resolution below the segment level on Lake Almanor. Each reservoir segment covers an area of several square-miles and use and conditions could be expected to vary to some degree within such large areas. Although boat traffic density may be low for the reservoir as a whole and for these segments, it may be considerably higher in more limited areas where boaters congregate or where traffic patterns intersect. It should also be recognized that conflicts might occur at any density of use. Wherever they occur, they require boater education, boater courtesy, and perhaps law enforcement presence to minimize them.

Considering boaters' needs and desires, the present study has not addressed boaters' desire for or interest in lower density boating opportunities. These appear to exist now at most peak use times, even during holidays, but may become less available if use increased. Providing a diversity of opportunities is a central tenet in providing quality recreation opportunities. This goal of diversity in opportunities is based on recognition of the diversity of public tastes and preferences for recreation. There is great diversity in how types of recreation are pursued (e.g., boating anglers may include both retirees in small, low-powered boats and tournament fishermen in large high-powered boats).

There is also great diversity in the activities many visitors participate in during a typical recreation visit, with time spent on land and on water, and boating time potentially divided between cruising, skiing, fishing, swimming from and relaxing in the boat. Each of these activities requires varying amounts of space and had different affects on surface capacity for boating use.

E5.2.3.5.2 Recommendations

FERC typically requires the monitoring of recreation activities at hydroelectric projects as described in the Draft RRMP. In addition to standard measures of recreation use levels, it is recommended that monitoring at Lake Almanor and Butt Valley Reservoir include boaters' perceptions of conditions, and indications of increased conflict or decreasing safety. These become more crucial if any significant changes are noted in the character or amount of boating use in the Project area.

It is recommended that reservoir boating facility improvements be focused on improving the distribution of boat launching facilities and increasing the parking capacity at existing facilities. Specific boat launch recommendations are discussed n the Recreation Needs Analysis Synthesis (Section E5.2.9), while specific proposals are outlined in the Recreation Proposals (Section E5.4). It is assumed that the private sector will be responsible for all future boat moorage development.

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E5.2.4 Projected Recreation Use Analysis

E5.2.4.1 Introduction

This section presents the results of the Projected Recreation Use Analysis, one of several recreation studies that were conducted by the Licensee for relicensing. This study also discusses visitors' places of origin and levels of activity participation, and provides a summary of regional recreational opportunities as they relate to future recreation use levels in the Project area.

The overall goal of this study was to project recreation activity levels in the Project area through the term of the new Project license (assumed to be approximately 30 years, or until 2035, for planning purposes). This information will be used in other studies to estimate when or if recreation use levels reach the capacity of existing recreation facilities and use areas. Several objectives that helped address the overall goal of this study included:

- Assess areas of visitors' origin and projected changes in the population of these areas;
- Assess participation trends for recreational activities occurring in the Project area;
- Assess potential effects of planned future residential development on projected recreation day use levels at Lake Almanor; and
- Assess the role of Project recreation resources in the region.

E5.2.4.2 Study Area

The study area includes two groups of recreation facilities (see Figure E5.1-1 and E5.1-2) and use areas (Level 1 and Level 2).

For Level 1 recreation sites and use areas, detailed data from Section E5.2.2—Existing Recreation Use Study was used to project recreation use levels for sites at Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches. These sites are generally located within and adjacent to (0.25 mile) the Federal Energy Regulatory Commission (FERC) Project boundary and can be assumed to be in the Project's area of influence, including the de-watered reaches (see Figure E5.1-1). Level 1 sites include:

- Lake Almanor Campgrounds (Loops 1, 2, and 3) (Licensee);
- Camp Conery Group Camp (Licensee);
- Canyon Dam Day Use Area (DUA) (Licensee);
- Almanor Scenic Overlook (Licensee);
- Eastshore DUA (Licensee);
- Last Chance Campground and Group Camp (Licensee);
- Ponderosa Flat Campground (Licensee);
- Alder Creek DUA (Licensee);
- Cool Springs Campground (Licensee);
- Belden Rest Stop (Licensee);
- Almanor Campground and Boat Ramp (United States Forest Service [Forest Service]);
- Canyon Dam Boat Launch/DUA (Forest Service);

- Almanor Rest Area on state route (SR) 89 (Forest Service);
- Gansner Bar Campground (Forest Service);
- North Fork Campground (Forest Service); and
- Queen Lily Campground (Forest Service).

Level 2 private commercial resorts were also included in this analysis (see Figure E5.1-3). Private recreation facilities and private residential facilities that generally are not open to public use and public undeveloped dispersed sites were not included in this analysis. The 19 private commercial resorts considered in this analysis include:

- Big Cove Resort
- Caribou Corners
- Cashman's Paul Bunyan Resort
- Dorado Inn
- High Sierra Resort
- Knotty Pine Resort
- Lake Almanor Resort
- Lake Cove Resort
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Miller's Resort
- Moonspinners Resort
- North Shore Campground
- Novotny's
- Plumas Pines Resort
- Swim Inn
- Vagabond Resort
- Wilson's Camp Prattville

E5.2.4.3 Methods

Methods for the Projected Recreation Use study focused on three primary tasks:

- Assessing the geographical origins of visitors and projected population changes in these areas of origin;
- Assessing changes in participation rates for activities common in the Project area; and
- Summarizing regional recreation demand trends that may influence future use of the Project area.

Existing facility use data for the Project area were obtained from the Licensee, the Forest Service, and from other relicensing study results. Information on the geographic origins of visitors, population trends, activity participation trends, and regional recreation resources was obtained from the Questionnaire Survey (see Section E5.2.1), the Existing Recreation Use Study (see Section E5.2.2), and the Regional Recreation Assessment (se Section E5.1.1).

E5.2.4.3.1 Methodology for Assessing Geographical Origins and Projected Population Changes

Geographical origins and projected population changes were assessed based on the counties of origin of visitors to the Project area. Visitors who participated in the 2001 Questionnaire Survey (see Section E5.2.1) were asked to provide their postal zip codes. The zip codes were then used to determine the counties and states of origin of the visitors.

Projected population changes were based on statewide and county level information from the California Department of Finance (CDF) Demographic Research Unit and the Nevada State Demographer's Office (NSDO). County and state populations were projected through the estimated term of the new license (2035).

E5.2.4.3.2 Methodology for Assessing Current and Future Demand for Activities Occurring in the Project Area

Analyzing existing and future demand for recreational activities in the Project area provides information needed to help define the needs of the Project area.

Recreational activity demand data were primarily from *Public Opinions and Attitudes on Outdoor Recreation in California* (California Department of Parks and Recreation (DPR) 1998). These data were used to understand existing and projected levels of participation of recreational activities occurring in the Project area. Because DPR does not project annual demand for recreation activities, available data were combined with other national and regional data (Cordell 1999), as well as local population trends, to project future demand for various recreation activities.

Recent visitor surveys measured current activity demand in two ways (see Section E5.2.1). Visitors were asked to identify all the activities they were participating in, as well as the primary activities they were engaged in while on their trips. The responses to these questions indicate overall participation rates and are a good indicator of overall demand for activities occurring in the Project area.

Projections of regional recreation activity demand were based primarily on data obtained by the most recent results from a national survey (Cordell 1999). In addition to national and regional information, data on recreational activity participation rates from 1987, 1992, and 1997 were compiled by DPR (DPR 1988, 1993, and 1998). The 1998 DPR study presents regional demand data for 43 recreational activities, including several activities that occur in the Project area. These data were used to assess recent trends in participation that may suggest future trends. Although these trends may not continue for the full 30 years or more of the estimated new license term, they do provide some general direction in estimating future demand for activities occurring in the Project area.

In addition to projecting future demand for activities in the Project area, site level demand was also assessed by applying the projected annual increases in participation in various activities (which incorporate changes in population and demographics) to existing use figures at each recreation site. Site occupancy was projected for developed day use sites and campgrounds in the Project area through 2035, the approximate term of the new license.

Site occupancy was determined by multiplying the average number of occupied campsites in campgrounds and parking spaces in day use sites by a conversion factor and/or a turnover factor that was derived from responses to the Questionnaire Survey (see Section E5.2.1) pertaining to group size, and comparing this number to a maximum theoretical capacity. The conversion factors used in this analysis were 3.6 people per campsite and 2.3 people per vehicle. Two timeframes were considered in this

comparison as indicators: recreation season (all days when the facility is open to the public between mid-May and mid-September), and peak months (all days in the months of July and August).

Several different recreation planning capacity threshold levels were used in this analysis. In this analysis, two levels of capacity thresholds were used for campgrounds, DUAs, and boat launches in the Project area. One capacity threshold indicator was 60 percent seasonal capacity at each developed recreation site.

A second capacity threshold indicator was 80 percent capacity at campgrounds and DUAs during the peak months of July and August. Projected utilization over these threshold indicator levels represents demand that may be in excess of capacity for planning purposes. Capacity threshold indicators are further discussed in the Recreation Carrying Capacity Analysis (Section E5.2.5).

E5.2.4.3.3 Methodology for Assessing the Potential Effects of Planned Future Residential Development on Projected Recreation Day Use Levels at Lake Almanor

The purpose of this assessment was to examine the effects of increased residential development on projected recreation use at Lake Almanor. Capacity utilization for the assessment focused on DUAs, as increases in the number of area residents are more likely to affect utilization of DUAs rather than campgrounds. This assessment was performed to address concerns that data from the California Department of Finance are too conservative to accurately project population increases in the vicinity of Lake

Almanor (and associated increases in recreation activity participation rates) and the resulting recreation facility needs during the next license period.

The annual number of recreation trips taken in a particular county has been thoroughly studied by Forest Service researchers (English et al. 1993). Numerous studies conducted by this group have shown that recreation trips to a county are influenced by the following factors.

- County population over 12 years old
- Percent of the population between 18 and 32 years old
- Percent of households with $30,000 or more income
- Availability of substitute recreation sites
- Average suitability rating of recreation sites within a county
- Quantity of recreation facilities available that are relevant to a particular recreation activity

Among these factors, research has demonstrated that age and income are the most important. Specifically, the percentage of households with incomes of $30,000 per year and greater and the percentage of the county population between 18 and 32 years old have the greatest impact on predicting recreation visits. In the models developed by English et al. (1993), county populations over 12 years of age and the quantity of recreation facilities have very minimal effects on predicting recreation visits.

To estimate the potential effects of proposed residential development in the Lake Almanor area, researchers used data from: (1) the statewide recreation survey, (2) planned developments "in the pipeline" from Plumas County (see the Land Use section of the draft license application, and (3) recreation participation rates from the 2001 area resident survey.

Regarding planned developments in the Lake Almanor area, there are a total of 2,177 dwelling units planned. Approximately a third of these units would be developed in the Bailey Creek subdivision, another third would be developed in the Foxwood subdivision, and the remaining third would be developed in a currently unnamed subdivision in the eastern portion of Lake Almanor.

Additionally, this analysis also examined the effects of planned residential development at the Dyer Mountain Resort next to Mountain Meadows Reservoir. The current plan for the Dyer Mountain Resort is that up to 1,200 dwelling units would be constructed. Lassen County has not yet received updated resort plans and permit approval requests from the developer.

The following assumptions were used to estimate the potential effects of these large, planned residential/resort developments on recreation resources at Lake Almanor.

1. Estimates of increased camping were not made; new residents will primarily engage in day use activities instead of camping in the Project area.
2. The average number of residents per dwelling is 2.3 persons.

3. The age of new home buyers will likely range from 45 to 60 years old.
4. The sale and occupancy of new homes will not occur until 2010. Three scenarios were investigated.
    - 25 percent of the homes are sold and occupied by 2010
    - 50 percent of the homes are sold and occupied by 2015
    - 100 percent of the homes are sold and occupied by 2020
5. The number of recreation days participated in is somewhat similar to respondents to the 1997 statewide survey of Californians' recreation patterns. However, since recreation participation declines with age, the average number of participation days will be reduced by 30 percent. For example, if the average annual number of boating days from the statewide survey was 10, this analysis would use a 7 as the average number of boating days for the Lake Almanor area. For homeowners in the Dyer Mountain Resort area, this figure will be reduced by 65 percent to reflect the fact they will have less impact on Project facilities. For homeowners in the Dyer Mountain Resort, it was assumed that 35 percent of these individuals would participate in motor-boating.
6. For the three residential developments proposed along the east shore, there would be 100 service workers that would live in the Lake Almanor area and have an impact on recreation facilities. This number would remain constant through the next license period.
7. For the Dyer Mountain Resort, there would be 200 service workers that would live in the Lake Almanor area and have an impact on the recreation facilities. This number would remain constant through the next license period.

8. Only day use activities that are dependent on day use site or boat launch facilities were examined, since these would be most affected by the new large, planned residential developments.

Approximately one-third (32 percent) of Chester area residents' day use activities occur during peak use (July and August) weekends. This is based on survey data showing that 40% of area residents' use is in late summer. An additional assumption is that 80 percent of the late summer use occurs on weekends.

E5.2.4.3.4 Methodology for Assessing Regional Recreation Demand Trends

The results from the Regional Recreation Assessment (see Section E5.1.1) were used to determine regional recreation demand trends. It is important to understand the regional context of the Project's recreation resources to determine how changes in recreational demand in the region could affect future recreation use of the Project area.

Unique recreational opportunities in the Project area were briefly assessed in this study. A more detailed analysis of regional recreational opportunities and a comparison of Project recreation resources with regional recreation resources is discussed in the Regional Recreation Assessment (Section E5.1.1).

E5.2.4.4 Results and Discussion

This section presents the results of the Projected Recreation Use Analysis and discusses the following topics:

- Areas of visitors' origins and projected changes in the population of these areas;
- Participation trends for recreational activities occurring in the Project area;
- Potential effects of planned future residential development on projected recreation day use levels at Lake Almanor; and
- The role of Project recreation resources in the region.

E5.2.4.4.1 Visitor Origin Assessment and Population Increases

To assess projected recreation activity in the Project area, it is important to evaluate current population data for the surrounding areas where visitors originate, as well as forecasts for changes in the population of these areas. Zip codes from the Questionnaire Survey (see Section E5.2.1) were used to determine the states and counties of origin of visitors to the Project area.

The majority (88.7 percent) of visitors to the Project area were from California (see Table E5.2.4-1). An additional 8.6 percent were from Nevada and 2.7 percent were from other western states including Oregon, Washington, Utah, and Arizona. Table E5.2.4-1 also displays the counties of origin and percentage of visitors to the Project area from each county. Just over a quarter of visitors were from Butte County, CA. Visitors from Plumas and Lassen Counties in California and Washoe County in Nevada accounted for nearly 20 percent of visitors to the Project area. The remaining visitors were from various counties in California, Nevada, and other states, though no single county accounted for a large percentage of visitors. Of the visitors from California, 63.5 percent

were from northern, 33.7 percent were from central, and 2.8 percent were from southern California. Additionally, over a quarter of the visitors from California were from two major metropolitan areas (17.7 percent from the San Francisco Bay Area and 8.2 percent from the Sacramento Area).

Table E5.2.4-1
Percentage of Visitors to the Project Area by States and Counties of Origin

State	County	Percentage
California		***88.7***
	Butte	25.9
	Plumas	7.2
	Lassen	6.7
	Sacramento	4.9
	Tehama	4.9
	Santa Clara	4.3
	Contra Costa	4.3
	Shasta	3.8
	Alameda	3.6
	Sonoma	2.9
	San Mateo	1.7
	Glenn	1.7
	Placer	1.7
	Solano	1.5
	Yolo	1.2
	Sutter	1.1
	Other	11.3
Nevada		***8.6***
	Washoe	5.5
	Churchill	1.4
	Other	1.7
Other States		***2.7***

Source: EDAW, Inc.

Table E5.2.4-2 details population projections for various counties in California and Nevada. These counties were selected because they are where many of the visitors to the Project area originate.

Table E5.2.4-2
Population Estimates and Forecasts for Selected Counties in California and Nevada

County	2000 Population	Yearly Average Change in Population (%)	Estimated 2035 Population[1]	2000-2035 Population Change (%)
Butte	203,171	1.1	297,956	46.7
Plumas	20,824	0.5	24,796	19.1
Lassen	33,828	2.1	70,013	107
Sacramento	1,223,499	1.6	2,132,472	74.3
Tehama	56,039	1.2	85,076	51.8
Santa Clara	1,682,585	1.1	2,467,559	46.7
Contra Costa	948,816	1.6	1,653,719	74.3
Shasta	163,256	1	231,269	41.7
Alameda	1,443,741	1.2	2,191,832	51.8
Sonoma	458,614	1.6	799,332	74.3
San Mateo	707,161	0.8	934,624	32.2
Glenn	26,453	0.6	32,614	23.3
Placer	248,399	4	980,205	294.6
Solano	394,542	1.4	641,832	62.7
Yolo	168,660	1.8	314,908	86.7
Sutter	78,930	2	157,851	100
California Total	**33,871,648**	**1.3**	**53,231,281**	**57.2**
Washoe	330,005	1.7	595,325	80.4
Churchill	26,290	3.3	81,903	211.5
Nevada Total	**2,059,433**	**2.6**	**5,057,144**	**145.6**

[1] *Assumes average yearly percent change in population does not change.*

Sources: CDF 2000 and NSDO 2000

This table indicates that the rapid growth that has been occurring in many of these counties is projected to continue through the year 2035. The population of Butte County, the county of origin for approximately 25 percent of visitors to the Project area (see Table E5.2.4-1), is expected to increase by nearly 47 percent (see Table E5.2.4-2). The populations of several other counties in California and one in Nevada are expected to increase over 100 percent by 2035.

Additionally, the population of California will increase by approximately 57 percent by 2035, while the population of Nevada will increase by 145 percent.

The composite growth rate for counties in northern California where visitors originated is 1.6 percent per year. In total, by 2035, it is estimated that the population of these counties will increase by approximately 126 percent. This increase will likely increase the number of visitors to the Project area, especially at DUAs. The composite growth rate for counties in central California is expected to be somewhat lower (1.4 percent increase per year). In total, by 2035, it is estimated that the population of these counties will increase by approximately 58 percent. While less of an increase (due to large existing populations), this composite growth rate in central California counties will also likely increase the number of visitors to the Project area, especially at overnight facilities (public campgrounds and private resorts).

This increase in county and state populations will likely result in continued increases in the number of visitors to and the participation rates of activities occurring in the Project area. The increase in populations will also increase the demand for Project recreation resources and facilities. Some population increases in counties in the Project region will be small (Plumas County—0.5 percent), while others will be larger (Lassen County—2.1 percent). Population increases in the counties closest to the Project will particularly increase demand for DUAs.

Population increases in counties that are farther from the Project (Washoe County—1.7 percent, Sacramento County—1.6 percent) will particularly increase demand for overnight recreational opportunities such as resorts and campgrounds.

E5.2.4.4.2 Activity Participation Assessment

E5.2.4.4.2.1 Participation Trends for Recreational Activities Occurring in the Project Area

Analyzing existing and future demand for recreational activities occurring in the Project area provides information needed to help define the needs of the Project area. Recreational activity demand data come from *Public Opinions and Attitudes on Outdoor Recreation in California* (DPR 1998). These data were used to understand existing and projected levels of participation of recreational activities occurring in the Project area. Because DPR does not project annual increases or decreases in demand for recreational activities, available DPR data were combined with other national and regional data (Cordell 1999), as well as local population trends, to project future demand for various recreational activities.

Recent visitor questionnaire surveys measured current activity demand in two ways (see Section E5.2.1). First, visitors were asked to identify all the activities they were participating in while in the Project area. Second, they were asked to identify the primary activities they were engaged in while on their trips.

Information on the most common activities among visitors is shown in Table E5.2.4-3. These data indicate overall participation rates and are a good indicator of overall demand.

Table E5.2.4-3
Most Common Activities Indicated by Visitors Surveyed

Activity	Participation[1] (percent)
Swimming[2]	**71**
Fishing	**71**
Hiking	**66**
Sightseeing	60
Wildlife viewing	49
Sunbathing	49
Motorboating	48
Picnicking	44
Bicycling on roads/bike paths	43
Tent camping	**40**
Waterskiing	36
RV camping	33
Golf	30
Canoeing	18
Hunting	17
Mountain biking on trails	17
Sailing	14
Riding OHVs	14
Personal watercraft (PWC) use	11
Horseback riding	9
Kayaking	9
Windsurfing	5

[1] *More than one activity could be indicated.*

[2] *Activities in bold represent most frequently mentioned primary activities by visitors to the Project area.*

Source: EDAW, Inc.

While visitors may have specific reasons for visiting an area, they are likely to engage in many different activities while in the Project study area. Although a wide array of activities are popular, the most common include: swimming (71 percent), fishing (71 percent), and hiking (66 percent).

The primary activities indicated by visitors are typically good indicators of one or several activities that are the primary motivators for visitors to use the Project area. These activities are also those that visitors usually spend the most time participating in.

The most frequently reported primary activities in the Project area are tent camping at Lake Almanor and fishing at both Butt Valley Reservoir and Belden and Seneca Reaches (see Table E5.2.4-3). Swimming ranks as the second and third most frequently mentioned primary activity at Lake Almanor and Butt Valley Reservoir, while fishing and hiking round out the top three primary activities in the Project river reaches.

Projections of regional recreational activity demand were based primarily on data obtained by the most recent DPR survey of California residents (DPR 1998), as well as on results from a national survey (Cordell 1999). The 1998 DPR study presents the most recent regional demand data for 43 recreational activities, including several activities which occur in the Project area. However, the 1998 DPR study does not project future use of these 43 recreational activities.

Although future participation rates in these activities were not assessed, DPR's baseline survey estimated existing demand for each of the common activities in the Project area as either high, moderate, or low. Participants in the DPR study were asked to rank those activities that they would most probably increase their participation if good opportunities were made available.

As indicated in Table E5.2.4-4, existing statewide demand is expected to be high for many of the activities that are common in the Project area (see Table E5.2.4-3).

Table E5.2.4-4
Existing Statewide Demand for Selected Activities in California

Activity	Existing Demand
Trail hiking	High
Primitive camping	High
Developed camping	High
Nature study/wildlife viewing	High
General use of open space	High
Picnicking	High
Beach activities	High
Swimming (non-pool)	High
Fishing (freshwater)	High
Bicycling (paved surface)	Moderate
Mountain biking (unpaved surface)	Low
Driving for pleasure	Low
Sailboating and windsurfing	Low
Kayaking, canoeing, and rafting	Low
Motorboating	Low
Waterskiing	Low
4-wheel drive vehicle use	Low
Motorcycling/all-terrain vehicle (ATV) use	Low
Hunting	Low

Source: DPR 1998

Recent regional data provide demand-related information for many of the activities that are common in the Project area. Table E5.2.4-5 indicates the projected change in participation in various activities by the year 2030 in the Pacific Region.

Although these trend percentages may not continue for the full 30 years or more of the estimated new license term, they do provide some general direction. The Pacific Region is defined as California, Oregon, Washington, Alaska, and Hawaii, collectively.

These projections are based on estimated local changes in population, as well as on changes in basic demographic variables which affect participation, such as age, race, and income. In addition, these projections also factor in the changing supply of recreational opportunities in the future. While the regional area used in this analysis is much broader than the study area, this information provides further context for estimating the potential growth in activities common in the Project area. Participation in many of the activities that are currently popular is expected to increase in the future. In general, this increase is expected to be larger in the Pacific Region than for the nation as a whole (Cordell 1999).

Table E5.2.4-5
Regional Trends in Outdoor
Recreational Activity Participation (2000 to 2030)

Activity	Pacific Region Trend (percent)
Rafting/floating	+41
Sightseeing	+46
Non-consumptive wildlife	+41
Biking	+33
Picnicking	+35
Visiting a beach	+31
Family gathering	+34
Hiking	+42
Non-pool swimming	+35
Motorboating	+41
Developed camping	+36
Walking	+39
Canoeing	+41
Fishing	+19
OHV riding	+16
Primitive camping	+22
Hunting	-24

Source: Cordell 1999

Based on the regional data provided in Table E5.2.4-5, projected increases in demand were estimated for recreational activities occurring in the Project area (see Table E5.2.4-6). Activity-specific demand projections were estimated for the period from 2000 to 2035.

Table E5.2.4-6
Projected Future Demand for Selected Activities in the Project Area

Project Area Recreation Activity	Projected Annual Percent Increase in Demand[1]	Projected Percent Increase in Demand 2000–2005	Projected Percent Increase in Demand 2000–2015	Projected Percent Increase in Demand 2000–2025	Projected Percent Increase in Demand 2000–2035
Sightseeing	1.31	6.8	21.7	38.6	58.0
Boating (non-motorized)	1.18	6.1	19.3	34.2	51.0
Observing wildlife	1.20	6.2	19.7	34.9	52.0
Photography	1.20	6.2	19.7	34.9	52.0
Hiking/walking[2]	**1.22**	**6.3**	**20.0**	**35.5**	**53.0**
Camping (developed)	1.07	5.5	17.3	30.4	45.0
Beach use/sunbathing	1.00	4.7	14.8	25.9	38.0
Motorboating	1.20	6.2	19.7	34.9	52.0
Swimming/wading	**1.03**	**5.2**	**16.6**	**29.1**	**43.0**
Picnicking	1.05	5.3	16.9	29.8	44.0
Waterskiing	1.02[3]	5.2	16.4	28.9	42.6
Bicycling/mountain biking	1.00	5.0	15.9	27.8	41.0
Camping (primitive)	**0.70**	**3.5**	**10.8**	**18.6**	**27.0**
Resting/relaxing	1.01[3]	3.0	9.4	16.1	23.3
Fishing (from shore)	**0.60**	**3.0**	**9.3**	**15.9**	**23.0**
Fishing (from boat)	**0.60**	**3.0**	**9.3**	**15.9**	**23.0**
OHV use	1.01[3]	2.5	7.8	13.3	19.1
Hunting	-0.90	-4.4	-12.6	-20.1	-27.0

[1] Based on Cordell 1999 data. Similar activity categories used wherever possible. All percentages are rounded.

[2] Activities in bold represent most frequently mentioned primary activities by visitors to the Project area (see Table E5.2.4-3).

[3] Data unavailable from Cordell 1999. Projection based on recent participation trends in California (DPR 1988, 1993, and 1998).

Note: Demand projections should be reassessed periodically.

Sources: Cordell 1999 and EDAW, Inc.

The regional data presented in Table E5.2.4-5 was used to determine the projected annual increase in demand for various activities in the Project area. These percentages were then compounded over the 2000 to 2035 period to determine projected increases in demand. The activities in Table E5.2.4-6 reflect those that are popular in the Project area and therefore are not exactly the same as those in Table E5.2.4-5. Due to the dynamic nature of recreation demand, these projections should be reassessed periodically to ensure a correlation with actual conditions. These projections show an increasing level of demand in the Project area for many of the common activities enjoyed by visitors to the Project area.

As indicated in Table E5.2.4-6, changes in demand through the year 2035 are anticipated to range from a decline of approximately 27 percent (hunting) to an increase of 58 percent (sightseeing).

It is important to note that caution should be exercised when interpreting the significance of differences between projected growth rates. More confidence should be placed in larger differences, such as between sightseeing (58 percent), and OHV use (19.1 percent), than in smaller differences, such as between sightseeing (58 percent) and hiking (53 percent).

One common activity in the Project area, not considered in the existing DPR analysis or in the national analysis (Cordell 1999), is the use of PWC, such as jetskis or waverunners.

Visitor survey data indicate that 11 percent of visitors to the Project area operate PWCs while on their trips. Since 1987, the number of new PWC in the United States has increased by 1,000 percent to 1.1 million watercraft (National Marine Manufacturers Association (NMMA) 2000). However, this dramatic increase seems to have leveled-off in the past few years.

Use of PWC generally requires the same facilities as the use of other motorized watercraft; however, PWC can also be launched from pickup trucks along the shoreline as well.

Table E5.2.4-6 indicates that many of the popular activities in the Project area are projected to have high levels of demand in the near future. In addition, not only are these activities currently popular in the Project area, but they will become increasingly popular at a faster rate than many other activities. For some of the activities, demand is expected to increase by 50 percent or more (considered high demand) between 2000 and 2035. These activities are listed below, followed by their existing participation rates.

This comparison shows a current high participation rate in the Project area for most activities except for non-motorized boating. This is likely due to the river and reservoir settings in the study area; however, Butt Valley Reservoir is a good location for this type of activity.

Activities with high levels of projected future demand through 2035 include:

Activities with High Projected Regional Demand	Current Project Area Participation
• Hiking	66 percent
• Sightseeing	60 percent
• Observing wildlife	49 percent
• Photography	49 percent
• Boating—non-motorized	9 percent

Based on the list above, additional hiking, walking, and wildlife/open space opportunities will likely be in high demand.

Demand is expected to increase at levels between 30 and 50 percent (considered moderate demand) through 2035 for several other activities including:

Activities with Moderate Projected Regional Demand	Current Project Area Participation
• Swimming	71 percent
• Beach use	49 percent
• Motorboating	48 percent
• Picnicking	44 percent
• Biking	43 percent
• Waterskiing	36 percent
• Camping—developed	33 to 40 percent

These activities represent some of the most common activities in the Project area, particularly swimming, beach use/sunbathing, picnicking, bicycling, and motorboating. The high percentage of participation in swimming (71 percent) in the Project area likely makes the Project area demand higher than other areas in the region for this type of activity.

Demand is expected to increase at levels below 30 percent (considered low demand) through 2035 for the following activities:

Activities with Low Projected Regional Demand	Current Project Area Participation
• Fishing—shore	71 percent
• Fishing—boat	71 percent
• OHV use	14 percent

Based on the list above, fishing and OHV use are expected to increase in demand at a lower rate compared to other activities. Currently, fishing receives a high rate of participation making the Project area unique for this activity compared to the region. However, fishing may slow in the future to somewhat lower levels compared to today if regional demand trends hold. Demand is expected to decrease for hunting by 27 percent between 2000 and 2035. This mirrors a declining national trend in hunting participation.

Similar to declining national trends, both fishing and hunting are experiencing decreases in the number of participants in California, based on the number of fishing licenses and hunting permits sold in California from 1996 to 2000. The sale of both resident and non-resident fishing licenses has decreased nearly 10 percent since 1996, with non-resident 10-day licenses experiencing the largest decrease (approximately 14 percent) (see Table E5.2.4-7). The reasons for this may include the higher cost of fishing licenses and/or a declining fishing success rate. This could lead to a decrease in participation and demand for fishing in the Project area.

Table E5.2.4-7
Number of Fishing Licenses Sold in California (1996–2000[1])

Type of License	1996	1997	1998	1999	2000	Percent Change (1996 to 2000)
Resident	1,403,126	1,385,261	1,289,618	1,272,083	1,265,471	-9.8
Non-resident (10-day)	16,752	20,421	20,951	14,624	14,443	-13.8
Non-resident (1 year)	12,448	12,070	11,441	11,661	11,689	-6.1
Total	**1,434,322**	**1,419,749**	**1,324,008**	**1,300,367**	**1,293,603**	**-9.8**

[1]Year 2001 data were incomplete at time of analysis.

Sources: DFG 2000 and EDAW, Inc.

The sale of resident and non-resident hunting permits has also decreased approximately 5 percent since 1996 (see Table E5.2.4-8). However, not all types of hunting permits have seen a decrease in sales. Non-resident deer tags, duck stamps, and 2-day waterfowl permits have all experienced increases in sales. Of particular importance is the rise in duck stamps and 2-day waterfowl permits, as waterfowl hunting is popular in the Project area. However, the increase in 2-day waterfowl permits likely represents a shift in permit preference, not necessarily an increase in waterfowl hunters.

Table E5.2.4-8
Number of Hunting Permits Sold in California (1996–2000[1])

Type of Permit	1996	1997	1998	1999	2000	Percent Change (1996 to 2000)
Resident Hunting	300,530	288,652	281,721	285,647	284,375	-5.4
Non-resident Hunting	3,434	2,936	2,945	3,251	3,436	0.06
Resident—Deer Tag	156,879	154,047	147,999	149,812	149,525	-4.7
Non-resident—Deer Tag	509	512	575	620	635	24.8
Duck Stamps	74,626	75,753	76,327	79,109	78,344	5.0
1-day Waterfowl Permit	33,698	37,044	27,864	20,381	15,084	-55.2
2-day Waterfowl Permit	6,662	7,614	12,144	16,347	17,313	159.9
Total	**578,334**	**568,555**	**551,573**	**557,166**	**550,712**	**-4.8**

[1] *Year 2001 data were incomplete at time of analysis.*

Sources: DFG 2000 and EDAW, Inc.

E5.2.4.4.2.2 Projected Recreation Use at Recreation Sites in the Project Area

The previous section projected future demand for various recreational activities that are popular in the Project area and elsewhere. Using this demand information, this section projects demand for each of the Level 1 recreation sites in the Project area. Site-level demand was assessed by applying the projected annual increases in participation in various activities (which incorporate changes in population and demographics) (see Table E5.2.4-6) to existing use figures at each recreation site. Seasonal (mid-May through mid-September) and peak month (July and August) percent occupancies were projected through 2035.

Table E5.2.4-9 provides projections of seasonal and peak month occupancy in 10-year increments for each DUA in the Project area through 2035. Unlike campgrounds, DUAs are generally used for shorter periods of time (a few hours or less) and typically during good weather conditions (picnicking, swimming, and sunbathing require warm, sunny days).

Table E5.2.4-9
Projected Increase in Seasonal and Peak Month Occupancy at DUAs in 10-Year Increments (2001–2035)

Project Area Sites	2001 Seasonal (Peak Month) Percent Occupancy[1]	Projected Annual Percent Increase in Occupancy[2]	Projected Seasonal (Peak Month) Percent Occupancy				Projected Date that 60 (80) Percent Capacity is Reached[3]	Projected Date that 100 Percent Seasonal (Peak Month) Capacity is Reached[3]
			2005	2015	2025	2035		
Lake Almanor								
Boat Launches[4]								
Almanor Boat Launch	49 (51)	0.60	50 (52)	53 (55)	57 (59)	60 (62)	2034 (—)	—
Canyon Dam Boat Launch/DUA	99 (113)	1.20	104 (119)	117 (134)	132 (151)	149 (170)	Present (Present)	2002 (Present)
Subtotal	**81 (91)**		**85 (95)**	**94 (106)**	**105 (118)**	**117 (132)**	**Present (Present)**	**2020 (2010)**
Picnic/Rest Areas[4]								
Almanor Rest Area (SR 89)	20 (20)	1.31	21 (21)	24 (24)	27 (27)	31 (31)	—	—
Almanor Beach	52 (60)	1.05	54 (63)	60 (69)	67 (77)	74 (86)	2015 (2029)	—
Dyer View DUA	31 (41)	1.05	32 (43)	36 (47)	40 (53)	44 (58)	—	—
Eastshore DUA	35 (25)	1.05	36 (26)	40 (29)	45 (32)	50 (36)	—	—
Almanor Scenic Overlook	17 (17)	1.31	18 (18)	20 (20)	23 (23)	26 (26)	—	—
Canyon Dam DUA	65 (63)	0.60	67 (64)	71 (68)	75 (73)	80 (77)	Present (—)	—
Subtotal	**49 (52)**		**51 (54)**	**55 (59)**	**61 (65)**	**66 (71)**	**2024 (—)**	**—**
Butt Valley Reservoir[4]								
Alder Creek DUA/Boat Launch	69 (64)	0.60	71 (66)	75 (70)	80 (74)	84 (78)	Present (—)	—
Bypass Reaches								
Belden Rest Stop (SR 70)	14 (24)	1.31	15 (26)	17 (29)	19 (33)	22 (38)	—	—
Total	**54 (60)**		**56 (62)**	**62 (68)**	**68 (76)**	**75 (83)**	**2012 (2031)**	—

[1] Based on traffic counter data or manual counts conducted in 2001. In 2001, pool levels at Lake Almanor were lower than normal and may have contributed to lower recreation days at the Almanor Boat Launch and higher recreation days at Canyon Dam Boat Launch/DUA.

[2] Based on projected trends in the primary activity at each site, see Table E5.2.4-6 (percentages are rounded).

[3] Based on the assumption that capacity (number of sites available) does not increase or decrease.

[4] *The potential impact of planned future residential and resort development in the Lake Almanor area is discussed in Section E5.2.4.4.2.3 of the final license application. Visitor use, principally day use, will likely increase as a result of these future developments. The timing of this impact is dependent upon project build-out, which is speculative at this time. However, assuming a build-out by 2020, boat launch parking capacity at Project area boat launches may exceed capacity. The need for additional boat launch parking may be accommodated by potential east shore private sector providers at Big Cove, Bailey Creek, and others, and/or at public sector boat launches with additional parking capacity. Future monitoring efforts will track visitor use levels. Capacity at other existing and proposed day use sites should be adequate to accommodate new visitors from these new residential developments, both residents and service workers. This assumes that the proposed recreation PM&Es are implemented by Licensee to expand capacity at the Project.*

Source: EDAW, Inc.

As a result, seasonal utilization of DUAs is typically lower than campgrounds. Peak month utilization of DUAs is generally higher because of good weather conditions (warm, sunny days) during the months of July and August. The primary concern of DUAs is to have adequate parking and other facilities for these peak month (good weather) days.

Capacity utilization of DUAs in the Project area was considered using two threshold indicator levels: 60 percent seasonal capacity, and 80 percent peak month (July to August) capacity. Any projected use over 60 percent for the season or 80 percent for peak months represents demand that may potentially be in excess of capacity for planning purposes.

Setting a capacity threshold lower than 100 percent is important for planning purposes. Management actions are necessary before facility utilization reaches 100 percent in order to plan potential expansions or take other non-construction-related management actions to avoid impacts related to crowding and overuse (utilization in excess of 100 percent) of a DUA. For sites that are expected to reach the 60 percent seasonal or 80 percent peak month thresholds, the year in which projected occupancy is estimated to reach these capacity levels is indicated for planning purposes. Additionally, for sites that are estimated to reach 100 percent seasonal or peak month capacity utilization, the year in which occupancy is projected to reach 100 percent is also indicated.

Occupancy projections were also determined by area (Lake Almanor, Butt Valley Reservoir, Belden Reach and Seneca Reach). This was done to accommodate for the fact that when one day use site in an area reaches capacity, other day use sites in the same area will begin to absorb the additional use.

As indicated in Table E5.2.4-9, seasonal utilization is currently exceeding 60 percent at three DUAs: Canyon Dam Boat Launch/DUA, Canyon Dam DUA, and Alder Creek DUA/Boat Launch. By 2035, seasonal capacity may reach 60 percent at two other DUAs: Almanor Boat Launch and Almanor Beach. Peak month utilization is currently exceeding 80 percent at only one DUA: Canyon Dam Boat Launch/DUA. By 2035, peak month utilization may reach 80 percent at one additional DUA: Almanor Beach.

Peak month capacity utilization is currently above 100 percent at the Canyon Dam Boat Launch/DUA. The very high utilization level at this site may be attributable to the fact that Almanor Boat Launch, the only other public boat launch on Lake Almanor, was unusable most of August and September, and many visitors may have opted to use Canyon Dam Boat Launch/DUA instead. Other private boat launches were also unusable during this timeframe due to low water/drought conditions.

In addition to projecting occupancy at individual DUAs, recreation resource areas were also examined. Butt Valley Reservoir and Belden and Seneca Reaches only have one DUA each, and thus were not included in the recreation resource area occupancy analysis. Projected occupancies by resource area are important for planning purposes

because they incorporate the redistribution of visitors when certain day use sites are at capacity. This redistribution of use can prolong the time it takes for a site to reach capacity, but can also decrease the time for other sites to reach capacity.

At Lake Almanor, the two boat launches were analyzed separately from other day use areas, as they represent a demand for specific boating-related activities. The boat launches on Lake Almanor are currently exceeding their seasonal and peak month weekend occupancy thresholds.

The boat launches may also reach 100 percent occupancy during peak months by 2010 and will likely reach 100 percent seasonal occupancy by 2020. The remaining DUAs on Lake Almanor, examined in total, may not reach 80 percent peak month occupancy, but are anticipated to reach 60 percent seasonal capacity by 2024.

These results indicate that expansion of existing facilities or new facility construction will be needed during the estimated term of the new license to continue to provide for increasing day use visitor demand in the Project area. This topic is further discussed in Section E5.2.5—Recreation Carrying Capacity Analysis and Section E5.2.9—Recreation Needs Analysis Synthesis.

Table E5.2.4-10 provides both season and peak month (July–August) projections of occupancy in 10-year increments for developed campgrounds in the Project area through 2035. Information from this table can be used to help guide potential future monitoring activities related to site capacity and/or consideration of potential changes in facility supply that would be needed in order to continue to meet the estimated visitor demand at these facilities. Past campground occupancy trends are discussed in detail in the Existing Recreation Use Study (Section E5.2.2). Capacity utilization of campgrounds in the Project area was considered at two threshold levels: 60 percent for the season, and 80 percent for the peak months. Projected utilization over 60 percent for the season or 80 percent for peak months represents demand that may be in excess of capacity for planning purposes.

A distinction is made between the season threshold (60 percent) and the peak month threshold (80 percent) because campground utilization tends to be higher during July and August due to various factors including weather and family vacations. Management actions are necessary before facility utilization reaches 100 percent to plan for potential expansion or other actions to avoid complications related to crowding and overuse.

For sites that may reach the 60 percent seasonal or 80 percent peak month thresholds, the year in which projected occupancy is estimated to reach these capacity levels is indicated. Additionally, for sites that are estimated to reach 100 percent seasonal or peak month capacity utilization, the year in which occupancy is projected to reach 100 percent is indicated.

Table E5.2.4-10
Projected Increase in Seasonal and Peak Month Occupancy at Campgrounds (2001–2035)

Project Area Campgrounds	2001 Seasonal (Peak Month) Percent Occupancy[1]	Projected Annual Percent Increase in Occupancy[2]	Projected Seasonal (Peak Month) Percent Occupancy				Projected Date that 60 Percent Seasonal (80 Percent Peak Month) Capacity is Reached[3]	Projected Date that 100 Percent Seasonal (Peak Month) Capacity is Reached[3]
			2005	2015	2025	2035		
Lake Almanor								
Last Chance Campground[4]	44 (44)	1.07	46 (46)	51 (52)	57 (58)	63 (64)	2030 (—)	—
Almanor Campground[4]	46 (61)	1.07	48 (64)	53 (71)	59 (79)	66 (88)	2026 (2026)	—
Lake Almanor Campground[4]	58 (77)	1.07	61 (81)	67 (90)	75 (100)	83 (112)	2004 (2004)	— (2025)
Camp Conery Group Camp[5]	87 (100)	1.07	—	—	—	—	Present (Present)	— (Present)
Subtotal[6]	**53 (70)**		**55 (73)**	**61 (82)**	**68 (91)**	**76 (102)**	**2013 (2013)**	**— (2033)**
Butt Valley Reservoir								
Ponderosa Flat Campground[4]	51 (61)	1.07	53 (63)	59 (71)	65 (79)	73 (88)	2017 (2026)	—
Cool Springs Campground[4]	35 (49)	1.07	37 (51)	41 (57)	45 (64)	50 (71)	—	—
Subtotal	**45 (57)**		**47 (59)**	**53 (66)**	**59 (74)**	**65 (83)**	**2027 (2032)**	**—**
Bypass Reaches								
Queen Lily Campground	58 (67)	1.07	61 (70)	68 (78)	75 (87)	84 (97)	2003 (2017)	—
North Fork Campground	55 (65)	1.07	57 (68)	64 (76)	71 (85)	79 (95)	2009 (2020)	—
Gansner Bar Campground	64 (71)	1.07	67 (75)	75 (83)	83 (93)	92 (104)	Present (2011)	— (2032)
Subtotal	**59 (67)**		**61 (70)**	**68 (79)**	**76 (88)**	**84 (98)**	**2003 (2016)**	**—**
Total[6]	**53 (68)**		**55 (71)**	**62 (79)**	**69 (88)**	**76 (99)**	**2012 (2016)**	**—**

[1] Annual recreation days were provided by the Licensee, Forest Service, or based on user counts taken during 2001 by EDAW. Values not in parentheses represent the season (mid-May through mid-September). Values in parentheses represent average occupancy during the peak months of July and August only.

[2] Projected increase based on projected trends in camping participation included in Table E5.2.4-6 (percentages are rounded).

[3] Based on the assumption that capacity (number of sites available) will not increase or decrease.

[4] Due to lower occupancy rates in 2001, 3 year (1999, 2000, and 2001) average daily occupancies were used for Last Chance, Almanor, Lake Almanor, Ponderosa Flat, and Cool Springs Campgrounds. Pre-2001 data for the bypass reach campgrounds was not provided by the Forest Service.

[5] Camp Conery is a group facility, which can accommodate up to 50 people at one time. It is rented primarily on weekends. In 2001, Camp Conery was rented 13 out of 15 (87%) weekends in the recreation season (mid-May to mid-September) and all weekends in the peak months (July and August). Demand for this type of group activity is projected to increase by 1.07% annually (Cordell 1999). Because the 60%/80% occupancy thresholds have already been reached at this site and because projected demand is high for group camping, projected occupancies were not calculated for this site.

[6] Subtotal and total do not include Camp Conery Group Camp or Last Chance Campground. These sites are addressed individually and are not averaged.

Source: EDAW, Inc.

Occupancy projections were also determined by area (Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches). This was done to accommodate for the fact that when one campground in an area reaches capacity, other campgrounds in the same area will begin to absorb the additional use.

Season occupancy at all campgrounds in the Project area, except Cool Springs Campground, is expected to reach and/or surpass the 60 percent threshold indicator by the year 2035. Peak month occupancy at all campgrounds, except for two, is also expected to reach and or surpass the 80 percent threshold indicator by the year 2035. The two campgrounds that should not reach and/or exceed the 80 percent peak month weekend threshold are Last Chance Campground and Cool Springs Campground. Additionally, occupancy at three campgrounds may reach the 100 percent threshold during peak months before 2035. These sites include Lake Almanor Campground, Camp Conery Group Camp, and Gansner Bar Campground.

In addition to these campgrounds exceeding either their season or peak month capacity by 2035, projected occupancy at each resource area (Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches) is also expected to exceed capacity. At Lake Almanor seasonal and peak month utilization may exceed capacity by 2035. Utilization may also reach 100 percent on peak months at Lake Almanor Campground by 2035. At Butt Valley Reservoir seasonal and peak month utilization may exceed capacity by 2035. Similarly, at Belden and Seneca Reaches, seasonal and peak month occupancy may be exceeded by 2035. Projected occupancies by resource area are important for planning

purposes because they incorporate the redistribution of visitors when certain campgrounds are at capacity. This redistribution of use can prolong the time it takes for a site to reach capacity, but can also decrease the time for other sites to reach capacity.

These results indicate that expansion of existing facilities or new facility construction will be needed during the estimated term of the new license to continue to provide for increasing visitor camping demand in the Project area. This topic is further discussed in Section E5.2.5—Recreation Carrying Capacity Analysis and Section E5.2.9—Recreation Needs Analysis Synthesis.

Private resorts play a significant role in providing recreational opportunities in the Project area. Nineteen private commercial resorts were included in this analysis.

Commercial resorts are generally open to the public for daily/weekly use for a fee whereas private residential facilities are longer-term (i.e., summer, year) cabin/condo-type rentals.

Phone interviews were attempted with the 19 commercial resorts in the Project area to gather capacity and occupancy information. Only seven (37 percent) of these commercial resorts agreed to participate in the interviews (see Section E5.2.1 for more details). Table E5.2.4-11 displays capacity and occupancy for the 19 private commercial resorts included in this analysis.

Table E5.2.4-11
Capacity and Occupancy of Private Commercial Resorts in the UNFFR Project Vicinity

Private Commercial Resorts	Capacity	Type	Seasonal Occupancy[1] (percent)	Memorial Day to Labor Day Occupancy (percent)
Big Cove Resort	43	35 RV, 8 cabins	96.7	100
Caribou Corners[2]	—	—	—	—
Cashman's Paul Bunyan Resort	—	—	—	—
Dorado Inn	27	7 cabins, 20 rooms	66.7	95.0
High Sierra Resort	10	10 RV	—	—
Knotty Pine Resort	10	6 cabins, 4 RV	70.7	92.0
Lake Almanor Resort	17	14 rooms, 3 cabins	—	—
Lake Cove Resort	97	51 tent, 46 RV	—	—
Lake Haven Resort	10	10 cabins	83.3	95.0
Lassen View Resort	64	13 tent, 51 RV	62.0	96.0
Little Norway Resort	12	11 cabins, 1 RV	46.7	60.0
Miller's Resort	2	2 RV	—	—
Moonspinners Resort	8	4 RV, 4 rooms	—	—
North Shore Campground	120	120 tent/RV	—	—
Novotny's	3	3 rooms	—	—
Plumas Pines Resort	80	8 cabins, 9 rooms, 63 RV	80.0	100
Swim Inn	—	—	—	—
Vagabond Resort	2	2 cabins	—	—
Wilson's Camp Prattville	39	5 cabins, 34 RV	—	—
Total	**632**	**—**	**72.3**	**91.1**

[1]*Season defined as days when sites were open to the public.*

[2]*Capacity information was not determined for three private resorts including Caribou Corners, Cashman's Paul Bunyan Inn, and Swim Inn. Additionally, occupancy data was not obtained from 12 private resorts.*

Source: EDAW, Inc.

Because only seven private commercial resorts participated in the phone interviews, use was projected for all resorts in aggregate, as opposed to individually. Utilization of private commercial resorts is projected in Table E5.2.4-12.

Table E5.2.4-12
Projected Increase in Season and Peak Occupancy at Private Commercial Resorts in 10-Year Increments (2001–2035)

Project Area Campgrounds	2001 Seasonal (Peak Month) Percent Occupancy	Projected Annual Percent Increase in Occupancy	Projected Seasonal (Peak Month) Percent Occupancy				Projected Date 60 (90) Percent Seasonal (Peak Month) Capacity is Reached[1]	Projected Date 100 Percent Seasonal (Peak Month) Capacity is Reached[1]
			2005	2015	2025	2035		
Private Commercial Resorts[2]	72 (91)	1.06	75 (95)	83 (105)	93 (117)	103 (130)	Present (Present)	2033 (2010)

[1] *Based on the assumption that capacity (number of sites available) will not increase or decrease.*

[2] *Due to lack of current occupancy data from over half of the private commercial resorts in the Project area, projected use for these sites is presented in aggregate.*

Source: EDAW, Inc.

The total capacity of all private resorts (includes all types of sites) in the Project area is nearly double that of public campgrounds. The seasonal occupancy of private resorts (72.3 percent) is also higher than public campgrounds (55 percent), indicating a higher level of use. By applying the 60 percent seasonal and 80 percent peak month campground capacity threshold indicators, current utilization of private commercial resorts likely exceeds capacity. Utilization of private commercial resorts should continue to increase and the 100 percent capacity season and peak thresholds may be exceeded by 2035.

These results indicate that expansion of existing facilities or new facility construction will be needed during the estimated term of the new license to continue to provide for increasing private commercial resort demand in the Project area. This topic is further discussed in Section E5.2.5—Recreation Carrying Capacity Analysis and Section E5.2.9—Recreation Needs Analysis Synthesis.

E5.2.4.4.2.3 Potential Effects of Planned Future Residential Development on Projected Recreation Day Use Levels at Lake Almanor

Planned future residential developments in the vicinity of Lake Almanor could potentially increase the number of visitors to Project area recreation facilities. Site capacity utilization was re-evaluated to account for this potential increase. Only day use sites were re-evaluated as part of this assessment. Estimates of increased camping were not made, as it was assumed that new residents will primarily engage in day use activities instead of camping in the Project area.

Table E5.2.4-13 shows potential new recreation facility developments in the Project area that would accommodate projected recreation use, expressed as "persons at one time" (PAOTs) (see Section E5.2.9—Recreation Needs Analysis Synthesis—for a complete list of all potential recreation facility developments in the Project area). Developments displayed are categorized into those that support motorized boating use and other forms of day use (e.g., fishing, swimming, beach use, and picnicking). New parking capacity for boaters during peak season weekends would be based on expansion of the Canyon Dam Boat Launch/DUA parking area and the proposed new North Shore Boat Launch at Lake Almanor.

Table E5.2.4-13
Increased PAOTs from Additional Recreation Sites.

Potential New Site Expansion	# of Parking/ Camping Spaces	Drive-in PAOT	Boat-in PAOT	Walk-in/Bike-in PAOT	Turn-over Rate[1]	Total PAOT Daily Max. Capacity
Lake Almanor						
Super Channel - Chester Shoreline Access	20	46	0	12		58
Stover Ranch - Chester Shoreline Access	10	23	0	12		35
Stumpy Beach DUA	10	23	5	12		40
Westwood Beach DUA	10	23	5	12		40
New Eastshore DUA	20	46	12	20		78
New Eastshore Campground	90	324	6	0		330
Catfish Beach Primitive DUA/Campground	30	108	4	4		116
PSEA Shoreline Public Swim Beach	44	101	0	20		121
Last Chance Campground Addition (6 sites)	6	22	0	0		22
North Shore Boat Launch Renovation	52	120	0	0	2	240
Almanor Beach Expansion	29	67	0	0		67
Canyon Day Use Area Expansion	15	35	6	24		65
Camp Conery Group Camp Expansion	40	40	0	0		40
Lake Almanor Campground (new DUA/Swim Beach)	40	92	25	25		142
Conversion of Eastshore DUA to Group RV Camp	15	54	0	0		54
Canyon Dam BL Expansion (anticipated expansion by Forest Service)	50	115			2	234

[1]*Verified in 2002 based on on-site observations at Canyon Dam Boat Launch/DUA.*

Source: EDAW, Inc.

Additional boating capacity of approximately 200 boat slips or mooring balls is likely to be added from various private developers (Sanford, 2002, personal communication). Additional boat mooring would most likely be added at the mouth of Bailey Creek and at Big Cove Marina, and there is a possible addition of another 100 slips near the Lake Almanor West Country Club area.

Table E5.2.4-14 presents the results of three different development scenarios on selected day use recreation activities. Planned residential subdivisions near Lake Almanor have a greater impact on Project recreation facility needs than the proposed Dyer Mountain Resort development.

Table E5.2.4-15 presents total projected recreation use from planned residential/resort development in 2020 at Lake Almanor versus proposed new recreation capacity planned at Lake Almanor. The year 2020 is estimated to be when all new planned development would be built out. Motor-boating and fishing are combined since visitors engaged in boating may also be fishing. From a capacity standpoint, leaving these activities separate would be double-counting the demand for boating-related facilities. The same rationale is applied to combining beach use and swimming.

For beach use and swimming activities, assuming planned future day use facilities and expansions occur, there is planned surplus capacity over the term of the new license during peak month weekends (the time when facilities are used the most). This excess

Table E5.2.4-14
Potential Effects of Planned Residential Development on Recreation Use Levels at Lake Almanor

New Home Residential Population Increase	Service Worker Population Increase	Activity	% Participation	Average Days of Participation	Increased Annual Total Visits[1]	Peak Month Weekend Visits[2]
Eastshore Growth-2010						
1252	100	Picnicking	0.42	12	3,091 (247)	989 (79)
1252	100	Motor boat	0.54	16	5,300 (423)	1,696 (135)
1252	100	Fishing	0.66	16	6,478 (517)	2,073 (166)
1252	100	Beach use	0.43	21	5,540 (442)	1,773 (142)
1252	100	Swimming	0.65	16	6,380 (510)	2,042 (163)
Subtotals					26,790 (2139)	8,573 (685)
Eastshore Growth-2015						
2504	100	Picnicking	0.42	12	6,184 (247)	1,979 (79)
2504	100	Motor boat	0.54	16	10,601 (423)	3,392 (135)
2504	100	Fishing	0.66	16	12,957 (517)	4,146 (166)
2504	100	Beach use	0.43	21	11,079 (442)	3,545 (142)
2504	100	Swimming	0.65	16	12,760 (510)	4,083 163)
Subtotals					53,581 (2139)	17,146 (685)
Eastshore Growth-2020						
5007	100	Picnicking	0.65	12	19,137 (247)	6,124 (79)
5007	100	Motor boat	0.54	16	21,198 (423)	6,783 (135)
5007	100	Fishing	0.66	16	25,908 (517)	8,291 (166)
5007	100	Beach use	0.43	21	22,154 (442)	7,089 (142)
5007	100	Swimming	0.65	16	25,516 (510)	8,165 (163)
Subtotals					113,913 (2139)	36,452 (685)
Dyer Mtn-2010						
690	200	Picnicking	0.42	12	852 (494)	273 (158)
690	200	Motor boat	0.35	16	947 (847)	303 (271)
690	200	fishing	0.66	16	1,785 (1035)	571 (331)
690	200	Beach use	0.43	21	1,527 (885)	488 (283)
690	200	Swimming	0.65	16	1,758 (1019)	563 (326)
Subtotals					6,869	2,198

New Home Residential Population Increase	Service Worker Population Increase	Activity	% Participation	Average Days of Participation	Increased Annual Total Visits[1]	Peak Month Weekend Visits[2]
Dyer Mtn-2015						
1380	200	Picnicking	0.42	12	1,704 (494)	545 (158)
1380	200	Motor boat	0.35	16	1,893 (847)	606 (271)
1380	200	Fishing	0.66	16	3,570 (1035)	1,143 (331)
1380	200	Beach use	0.43	21	3,053 (885)	977 (283)
1380	200	Swimming	0.65	16	3,516 (1019)	1,125 (326)
Subtotals					13,737	4,396
Dyer Mtn-2020						
2760	200	Picnicking	0.65	12	5,274 (494)	1,688 (158)
2760	200	Motor boat	0.35	16	3,787 (847)	1,212 (271)
2760	200	Fishing	0.66	16	7,141 (1035)	2,285 (331)
2760	200	Beach use	0.43	21	6,106 (885)	1,954 (283)
2760	200	Swimming	0.65	16	7,032 (1019)	2,250 (326)
Subtotals					29,340	9,389

Note: 1, 2 - Added impact of service workers displayed in parentheses

Source: EDAW, Inc.

capacity would likely be absorbed by existing visitors and other future recreational visitors to Lake Almanor from the surrounding counties and state-wide areas.

For other land-based day use activities (picnicking, beach use, and swimming), there will likely be some surplus day use facility capacity during the license term, even when considering the combined effects of residential development on the eastern shore of Lake Almanor and the proposed development of Dyer Mountain Resort. This conclusion remains the same when the recreational impacts of additional service workers is also considered. This excess capacity would be used by residents from surrounding counties and other state-wide areas.

Table E5.2.4-15
Total Planned Residential Development Projected Recreation Use in 2020 Versus Proposed New Recreation Facility Capacity at Lake Almanor

Activity	Peak Month Weekend (PAOTs)[1]	Proposed new capacity (PAOTs)
Picnicking	7,812 (237)	24,000
Motor-boating/fishing	7,995 (406)	3,680 to 7,520 (6,880 to 10,720)[2]
Beach use/Swimming	9,043 (489)	14,435

Note: 1-numbers within parentheses include increased estimated PAOTs from service workers; 2-numbers within parentheses include an additional 200 boat slips or mooring balls provided by private developers.

Source: EDAW, Inc.

Projected boating facility needs could be met through assumed future public boat launch parking capacity expansion funded with Cal Boating grant funding through the Forest Service. Private sector resorts may also expand their boating facility capacity around Lake Almanor over time. However, by approximately 2020, there may be a need to add more boat launch parking capacity, since projected motorized boat use slightly exceeds proposed new public capacity levels.

One assumption about the level of projected recreation participation may offset the need for more boating-related facilities. This analysis assumed a slightly lower frequency of participation in boating-related activities among individuals who might purchase residences at Dyer Mountain Resort and individuals that purchase homes along the eastshore of Lake Almanor. If a substantially smaller proportion of Dyer Mountain Resort residents do not participate in motor-boating, then the boat launching capacity needs at Lake Almanor may not be an issue in the future.

Another offsetting factor regarding boat launching capacity is the number of people willing to pay to launch at privately owned facilities, or public ones (if the Forest Service

begins to charge fees in the future, a trend in other forests nationwide). If some boaters are willing to pay a fee and all the anticipated private boat slips and mooring balls are developed, then boating needs may be met throughout the next license period.

E5.2.4.4.2.4 Role of Project Recreation Resources in the Region

The Project area, including Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches, represents an important regional resource in terms of recreation facilities and opportunities in northern California. It provides for a relatively unique recreational experience that bridges the gap between the smaller, less developed areas and the larger, more highly developed areas in the region.

Several qualities distinguish the Project area from other regional recreation areas. It is easily accessible via highways from all directions and it is in proximity to many major population centers. The cooler, temperate climate of the Project area, due to its location in the Sierra Nevada Mountains, is a large attraction to visitors from hotter valley areas. Finally, the Project area has a unique mix of public and private/resort recreation facilities, country clubs, and residential development that is uncommon in many of the other recreation areas in the region.

The unique features and opportunities of the Project area are briefly discussed below and further discussed and compared to other regional recreation areas as outlined in Section E5.1.1.

Belden and Seneca Reaches

Belden and Seneca Reaches are primarily steep, forested river canyons. Belden Reach has fairly good access, while Seneca Reach is more remote, with limited access. Overall, Belden and Seneca Reaches are very different from one another. Seneca Reach has far fewer dispersed campsites and less fishing due to poor access and steep terrain. Belden Reach has many more developed facilities and dispersed shoreline sites compared to Seneca Reach; but along certain sections of their lengths, the two river reaches are more similar. Seneca Reach allows for a more primitive fishing experience, compared to Belden Reach, with many opportunities for solitude.

The level of fishing use on Belden Reach is considered moderate, while fishing on Seneca Reach is considered low due to poor access, except at the southern end. Belden Reach is popular with anglers, though not so heavily used that the area is considered crowded.

One of the unique characteristics of Belden Reach (but not Seneca Reach) is the opportunity for dispersed shoreline camping and day use, an activity not always available at other recreation areas. The primary reason for this is that the majority of Belden Reach in the Project area flows through the Plumas National Forest.

There is also good, but limited road access and developable sites along Belden Reach.

Based on the unique features of Seneca and Belden Reaches, demand will continue to increase in the future for the recreational opportunities available there.

Reservoirs

The role of Lake Almanor in the region is unique because of its large-size reservoir surface water area; moderate level of development; good highway access; unique mix of public and private development; cooler temperate summer climate; and opportunities for relatively quiet and remote experiences, as well as developed experiences.

Lake Almanor is a popular area for various recreational activities including motorboating, waterskiing, PWC use, camping, hiking, and fishing. Use levels at Lake Almanor are considered high. This takes into consideration the amount of water-based recreation and general patterns of development and use on land. Butt Valley Reservoir is unique in that it is primarily used for fishing. Large motorboats and PWC are not allowed on the reservoir. This lack of faster, higher powered boats and PWC adds to the distinctive quiet and remote setting and enhances the quality of the fishing experience at Butt Valley Reservoir.

Based on the unique features of Lake Almanor and Butt Valley Reservoir, demand will continue to increase in the future for the recreational opportunities available at each reservoir.

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E5.2.5 Recreation Carrying Capacity Analysis

E5.2.5.1 Introduction

This section presents the results of the Recreation Carrying Capacity Analysis, one of several recreation studies that were conducted by the Licensee for relicensing.

At reservoirs and recreation areas, particularly near urban areas, there are limits to how much recreation use existing facilities can accommodate, as well as how much use various land and surface water areas can accommodate. At some point, recreation demand cannot be met without negatively affecting sensitive resources in the area and/or the recreational experiences that people seek when they come to an area such as the Project area. The goal for decision-makers is to manage recreation use levels so that they do not exceed overall capacity and standards set for the Project area.

The primary purpose of this analysis is to investigate the existing capacity of recreation resources in the Project area. Recreation "carrying capacity" has been defined in a number of ways, but one useful definition is "the level of use beyond which impacts exceed standards" (Shelby and Heberlein 1986).

This section consists of an analysis of recreation capacity using four indicators: ecological capacity, physical/spatial capacity, facility capacity, and social capacity.

E5.2.5.1.1 Objective of the Study

The objective of this study is to determine the maximum level of recreational facility development and recreational use which provides high quality recreational opportunities to the Project's primary recreational groups, protects sensitive and natural resources in the area, and is consistent with the planned operation of the Project. This study assesses what level of recreational use will be sustainable, compatible, and within the overall capacity of the Project area during the term of the new license.

E5.2.5.1.2 Components of the Study

This study assesses the recreation capacity of the Project area using various types of capacity considerations. Capacity assessments are presented on site-specific and resource area levels (both reservoirs and river reaches), along with overall capacity assessments for the study area. Capacity evaluations are presented based on four capacity types: ecological, physical/spatial, facility, and social. A summary of this analysis is provided along with judgments as to whether each site or area is below, approaching, at, or exceeding capacity based on a review of the four capacity types.

E5.2.5.2 Study Area

The study area includes the lands within and adjacent to (0.25 mile) the Federal Energy Regulatory Commission (FERC) Project boundary at Lake Almanor and Butt Valley Reservoir, areas of the Belden and Seneca Reaches that are used for recreational purposes, and the Level 1 developed facilities within these areas that are listed below (see Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Vicinity).

- Lake Almanor Campground (Loops 1, 2, and 3) (Licensee)
- Camp Conery Group Camp (Licensee)
- Canyon Dam Day Use Area (DUA) (Licensee)
- Almanor Scenic Overlook (Licensee)
- Eastshore DUA (Licensee)
- Last Chance Campground/Group Camp (Licensee)
- Ponderosa Flat Campground (Licensee)
- Alder Creek DUA/Boat Launch (Licensee)
- Cool Springs Campground (Licensee)
- Belden Rest Stop (SR 70) (Licensee)
- Almanor Campground (United States Forest Service [Forest Service])
- Almanor Group Reservation Camp (Forest Service)
- Almanor Beach (Forest Service),
- Almanor Overflow Camping Area (Forest Service)
- Almanor Rest Area on state route (SR) 89 (Forest Service), also called Almanor Picnic Area
- Lake Almanor Recreation Trail (LART) (Forest Service)
- Almanor Boat Launch (Forest Service)
- Canyon Dam Boat Launch/DUA (Forest Service)
- Gansner Bar Campground (Forest Service)
- North Fork Campground (Forest Service)
- Queen Lily Campground (Forest Service)

In addition, 19 Level 2 private commercial resorts (open to the public) were also included in this analysis (see Figure E5.1-3—Private Recreation Facilities in the UNFFR Project Vicinity). Private recreation facilities and private residential facilities that are not open to public use, as well as undeveloped dispersed shoreline sites, were not included in this analysis.

The 19 private commercial resorts (open to the public) that were considered in this analysis are listed below.

- Big Cove Resort
- Caribou Corners (near SR 70)
- Cashman's Paul Bunyan Resort
- Dorado Inn
- High Sierra Resort
- Knotty Pine Resort
- Lake Almanor Resort
- Lake Cove Resort
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Miller's Resort
- Moonspinners Resort
- North Shore Campground
- Novotny's
- Plumas Pines Resort
- Swim Inn
- Vagabond Resort
- Wilson's Camp Prattville

The study area for this analysis excludes the on-water surface area of the two reservoirs and Belden Forebay. This subject is addressed in the Reservoir Boating Study (see Section E5.2.3).

E5.2.5.3 Methods

Methodology for the recreation carrying capacity analysis is described below. The capacity analysis includes a review of visitor use numbers and physical factors at each site or resource area, excluding on-water capacity.

E5.2.5.3.1 Methodology for Assessing Capacity Types

This study assesses the recreation capacity of the Project area using four types of capacity considerations. A large body of research exists on crowding and resource deterioration in recreation settings. Such research generally distinguishes between these four types of carrying capacity in recreation settings: ecological, physical/spatial, facility, and social (Shelby and Heberlein 1986).

Once these four capacity types have been investigated, it is also important to identify which type is a limiting factor(s). The limiting factor often drives decision-making regarding capacity determinations and is often the "trigger" that determines when recreation use has reached a desired level of capacity. Some locations may have multiple limiting factors.

Two geographic levels of capacity were assessed in this analysis: site-specific level and resource area level (both reservoirs and river reaches). Based on a review of these two levels, overall capacity assessments were then determined for the study area. In summarizing overall recreation capacity at site and resource area levels, judgments were made as to whether an area was below, approaching, at, or exceeding capacity. These judgments were based on general guidelines developed for this study. Some of these

guidelines were developed from National Recreation and Parks Association (NRPA) guidelines and standards, as well as other relicensing studies conducted by EDAW for recreation resources in the Pacific Northwest and western US.

E5.2.5.3.1.1 Ecological Capacity

Ecological capacity is concerned with recreational use and its potential impacts to several ecosystem components such as wetlands, riparian vegetation, sensitive plants, and soils. This assessment was accomplished through brief on-site observations of the recreation sites in the study area and of general reservoir shoreline conditions. Important impacts noted in the field included litter, sanitation problems, and wetland and riparian vegetation impacts (see Section E5.1.3—Recreation and Public Use Impact Assessment). It was also important to consider sensitive shoreline wildlife, plant species, and cultural resources. These resources were analyzed using GIS data layers and terrestrial and cultural resource reports as available.

E5.2.5.3.1.2 Physical/Spatial Capacity

Physical/spatial capacity is concerned with the area or spatial needs of space-dependent recreational activities, such as the expansion potential of existing facilities. This assessment was accomplished through instantaneous counts of users or activities at each Project area site. Counts and boats capacities for each of the reservoirs and the segments of Lake Almanor are addressed in Section E5.2.3—Reservoir Boating Study. Consideration of the physical limitations at each site or use area were noted with regard

to existing uses, as well as the potential for future expansion. Property ownership boundaries and site topographic limitations were used as criteria for this capacity type.

E5.2.5.3.1.3 Facility Capacity

Facility capacity is concerned with the use of facilities such as the number of boats or vehicles at a boat ramp or parking lot or the percent of occupancy of various facilities such as campgrounds. Facility capacity was assessed by collecting and analyzing various data. These data sources include: on-site survey counts and user counts provided by operators (data from Section E5.2.2—Existing Recreation Use Study), evaluation of facility conditions (data from Section E5.1.2—Recreational Facility and Condition Inventory), and by obtaining information from facility operators (data from Section E5.1.2—Recreational Facility and Condition Inventory, as well Section E5.2.1—Questionnaire Survey). Occupancy at private recreation sites was also investigated; however, no other capacity types were determined for private recreation sites. To determine if facility use may be at capacity, several factors were evaluated including: seasonal (mid-May through mid-September) utilization rates, peak month (July and August) utilization rates, and the number of times during the season that capacity was exceeded. These utilization rates were evaluated using data collected for Section E5.2.2—Existing Recreation Use Study, and compared against capacity threshold indicators described below.

Occupancy rates for camping facilities were obtained from use observation surveys and summaries of overnight facility occupancy records provided by operators, while

occupancy rates for day use sites were obtained from traffic counters and/or user counts (see Section E5.2.2).

These data were used to extrapolate approximated occupancies for the season and peak months at public developed day use and campground facilities in the Project area. Seasonal occupancy rates were also developed for private commercial recreation sites (open to the public).

UNFFR Developed Public Recreation Facility Capacity Thresholds

Recreation facility capacity thresholds were developed to determine when new campground, DUA, and boat launch improvements were needed. It should be noted that capacity related management actions should not be based on one year's worth of data that indicates occupancies exceed a threshold indicator. Because weather, forest fires, and drought conditions can affect use, a clear trend should be established and identifiable (3 out of 5 years hitting the capacity targets) before capacity related management actions are taken. Also, the capacity threshold indicators developed for this study are preliminary and were reexamined during the development of the Draft Recreation Resource Management Plan (RRMP) in 2002.

The capacity threshold methodology was adapted from indicators used by federal agencies (the Forest Service, United States Bureau of Land Management (BLM), and others) and other resource managers including number of visitors and facility capacity utilization percentages. Indicators are applied to the "season," defined as the period of

time that recreation facilities are generally open to the public (mid-May through mid-December), and to the "peak" months, defined as the months when use levels are highest (July and August).

Capacity thresholds were determined for campgrounds, DUAs, and boat launches in the Project area.

Public Developed Recreation Facilities. For this study, three public developed recreation facility capacity threshold indicators were developed and are described below. All public campgrounds and public boat launches within the same geographic area are considered in total, rather than on a site-by-site basis. For day use/picnic areas/swim beaches, these facilities are considered on a site-by-site basis rather than for a whole geographic area due to their uniqueness and proximity to nearby residents.

One public developed facility capacity threshold that was developed for this study is seasonal capacity utilization. This threshold is considered to be one of the primary capacity indicators. Because some public facilities in the same recreation resource area may act as substitute sites (i.e., when one campground is nearing capacity, the other campgrounds in the area absorb the added use), seasonal thresholds were developed on a recreation resource area basis, as opposed to a site-by-site basis. One exception is Last Chance Campground/Group Camp, which does not act as a substitute to Lake Almanor campgrounds. The seasonal capacity threshold that was developed for this study is 60 percent. This means when a group of like facilities in the same recreation resource area

(reservoir, Project river reach, etc.) reaches 60 percent utilization, it is considered to be at capacity for planning purposes. Once this level is reached, various actions may be considered including facility expansion or a new facility, implementation of a reservation system, or better communication to visitors about other sites in the area.

Using the 60 percent seasonal threshold as a single criterion also may not take into consideration the full story of how a facility is being used.

As a result, additional public developed facility capacity thresholds may be used as cross-check indicators. One secondary cross-check threshold for facilities is peak month (July and August) capacity utilization. Due to a variety of factors (weather, short season, summer vacation, etc.), facilities tend to receive heavier use during July and August as compared to other months during the season. Based on this increased use, an 80 percent peak month capacity utilization threshold was established. This means that when utilization of an individual facility reaches 80 percent during July and August, it may be considered to be at capacity, as long as seasonal use is also at or approaching 60 percent. This percentage would likely include many days at 90 to 100 percent capacity.

A second cross-check public developed facility capacity indicator should also be considered. This facility capacity threshold is the percentage of season days when the facility is at or above 90 percent utilization. This threshold targets the total number of days during the recreation season (mid-May through mid-September) that the facility is operating at near physical capacity levels. Fifteen percent was determined to be the

percent of days a facility should be at or exceeding this 90 percent capacity level for the facility, as long as seasonal use is also at or approaching 60 percent. While 15 percent may seem fairly low as a threshold, it usually equates to approximately 20 days (nearly 3 weeks) during a season, which is a significant number of days.

Resource area level assessments of facility capacity will summarize conclusions from the facility analysis.

E5.2.5.3.1.4 Social Capacity

Social capacity is concerned with visitors' perceptions of surrounding recreational use and related social capacity concerns such as user conflicts, lack of solitude, and perceptions of crowding. This study analyzes the results from specific questions as described in Section E5.2.1—Questionnaire Survey. Several questions related to social capacity were included in the Questionnaire Survey which was administered at sites in the study area. For each land-based site, survey results are presented for how visitors perceive crowding at the sites surveyed. The results from this question reflect the average crowding score for users at each site based on a 9-point scale (shown below) ranging from 1, indicating "Not at all Crowded," to 9, indicating "Extremely Crowded" (Shelby and Heberlein 1986).

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

Results were obtained in a similar fashion for each reservoir segment based on whether respondents had boated there during the day they were contacted (results are presented in Section E5.2.3—Reservoir Boating Study). Questionnaire responses regarding perceptions of crowding and user conflicts were used to assess whether various Project areas are approaching their social carrying capacities. Along with these questionnaire responses, Recreation Opportunity Spectrum (ROS)-related survey responses were used to establish social carrying capacities for usable Project land and water areas.

E5.2.5.3.2 Methodology for Identifying Limiting Factors

For each site in the Project area, conclusions were drawn using data showing which of the four capacity types was a limiting factor(s). Qualitative and quantitative data were used to make these conclusions. A limiting factor is defined as an indicator that limits or puts a cap on the level of recreational use (capacity) at a site or area. For example, the number of campsites available (facility capacity) potentially limits camping if all the campsites are occupied. If the campground has no space to expand, physical capacity is a second indicator to consider. If a site is located next to sensitive wildlife or vegetation resources, these resources may be considered ecologically-limiting factors. Finally, if a site or area was perceived as extremely crowded, social capacity may be a limiting factor, no matter what the use level is. Once identified, limiting factors become the focus for assessing recreation capacity at a site or area, or monitoring recreation capacity in the future.

While all four capacity types being considered (ecological, physical/spatial, facility, and social) may potentially be limiting factors, typically only one or two factors dominate.

Qualitative and quantitative data will be used in this selection process. A table of limiting factor(s) will be prepared for each site, segment, and reservoir.

E5.2.5.3.3 Methodology for Assessing Overall Capacity Levels

Based on the assessment of the four capacity types and the identification of limiting factors, the capacity of the three recreation resource areas (Lake Almanor, Butt Valley Reservoir and the river reaches) was assessed. To summarize this analysis, recreation sites and reservoirs were prioritized from highest to lowest capacity concerns. A table was prepared summarizing the condition of each recreational capacity parameter, and identifying limiting carrying capacity parameters and levels of priority for each geographic recreation resource area.

In summarizing overall recreation capacity at a facility level or resource area level, judgments were made as to whether use at a facility or area was below, approaching, at, or exceeding capacity. These judgements were based on guidelines presented in Table E5.2.5-1. Some of these guidelines were developed from NRPA guidelines and standards (1990), as well as studies conducted by EDAW for recreation resources (1981, 1990, and 2000) and by PacifiCorp and Cowlitz PUD (2001).

Table E5.2.5-1
Guidelines for Assessing Recreation Capacity Levels at Public Sites

Capacity Types/Variables	Capacity Levels			
	Below	**Approaching**	**At**	**Exceeding**
Ecological				
Bare ground evident Wetland impacts Riparian impacts Other vegetation loss/damage Erosion evident Sanitation and trash concerns	Minimal to no impacts observed	Some minor impacts observed	Minor to moderate impacts observed, but appear to be sustainable	Excessive impacts observed, not sustainable
Physical/Spatial				
Available land space/area for expansion if needed	Area is adequate—high to moderate expansion capacity	Area is adequate—minimal expansion capability	Area is adequate—no expansion capability	Area is not adequate—no expansion capability/use areas may overlap
Facility				
Public Developed Recreation Facility Capacity Utilization	<40 percent season	40 percent season	60 percent season	>60 percent season
	<70 percent July–August	70 percent July–August	80 percent July–August	>80 percent July–August
	<10 percent of season days at 90 percent	10 percent of season days at 90 percent	15 percent of season days at 90 percent	>15 percent of season days at 90 percent
Boat launch wait time	Acceptable	Acceptable	Acceptable	Unacceptable
Social				
User conflicts reported	Few or no significant conflicts reported	Some conflicts reported, but considered minor or minimal	Some conflicts reported, but considered an acceptable level	Moderate to high number of conflicts reported; considered an unacceptable level
Perceived crowding levels—percent who felt crowded to some extent	<2.9	2.9–4.0	4.0–6.0	>6.0

Sources: NRPA 1990; Shelby and Heberlein 1986

E5.2.5.4 Results and Discussion

E5.2.5.4.1 Overall Study Area Site Occupancy, Capacity, and Utilization

E5.2.5.4.1.1 Licensee and Forest Service Developed Recreation Sites

Campground and day use site occupancy utilization data for the season (mid-May through mid-September) and peak months (July and August) are presented in Table E5.2.5-2. Traffic counter data and user count data from the Existing Use Study (Section E5.2.2) was used as a basis for estimating facility utilization. Site occupancy was determined by multiplying the average number of occupied campsites in campgrounds and parking spaces in day use sites by a conversion factor and/or a turnover factor that was derived from responses to the Questionnaire Survey (see Section E5.2.1) pertaining to group size (people per vehicle or campsite), and comparing this number to a maximum theoretical capacity. The conversion factors used in this analysis were 3.6 people per campsite and 2.3 people per vehicle. This comparison is meant to be a general indicator and may be subject to site-specific conditions that may affect how this information is used.

During the season, campground utilization was approximately 53 percent (see Table E5.2.5-2). This capacity utilization level is considered to be approaching capacity (40–60 percent). A newer, well-designed site should function adequately at this level, if it allowed to rest during the off-season and the site is designed to accommodate higher use levels. During July and August, campground utilization rose to approximately 68 percent. This capacity utilization level is below the peak month 80 percent capacity threshold level for campgrounds, and is considered to be approaching capacity. Individual sites are discussed in further detail below and in Table E5.2.5-2.

Table E5.2.5-2
Estimated Seasonal and Peak Capacity of Project Area Licensee- and Forest Service-Developed Recreation Sites

Recreation Sites	No. of Sites/ Spaces	Turnover Rate (DUAs Only)[3]	MANAGED USE SEASON[1]				PEAK MONTH[2]			
			Maximum Visitor Capacity[4]	Estimated Average No. of Daily Occupied Sites/Space[5]	Estimated Current Visitor Use[4]	Current Seasonal Occupancy (percent)	Maximum Visitor Capacity[4]	Estimated Average No. of Daily Occupied Sites/Space	Estimated Current Visitor Use[4]	Current Peak Month Occupancy (percent)
Developed Campgrounds										
Lake Almanor	Campsites									
Last Chance Campground[6]	12	—	5,270	5	2,328	44 percent	2,678	5	1,183	44 percent
Almanor Campground[6]	102	—	44,798	47	20,642	46 percent	22,766	62	13,838	61 percent
Lake Almanor Campground[6]	131	—	57,535	76	33,379	58 percent	29,239	101	22,543	77 percent
Camp Conery Group Camp[7]	—	—	2,250	—	1,950	87 percent	500	—	500	100 percent
Subtotal[8]			102,334		54,022	53 percent	52,006		36,382	70 percent
Butt Valley Reservoir										
Ponderosa Flat Campground[6]	61	—	26,791	30	13,571	51 percent	13,615	36	8,258	61 percent
Cool Springs Campground[6]	30	—	13,176	10	4,612	35 percent	6,696	14	3,281	49 percent
Subtotal			39,967		18,183	45 percent	20,311		11,539	57 percent
Bypass Reaches										
Queen Lily Campground[6]	12	—	5,270	7	3,074	58 percent	2,678	8	1,786	67 percent
North Fork Campground[6]	20	—	8,784	11	4,831	55 percent	4,464	13	2,902	65 percent
Gansner Bar Campground[6]	14	—	6,149	9	3,953	64 percent	3,125	10	2,232	71 percent
Subtotal			20,203		11,858	60 percent	10,267		6,920	67 percent
Subtotal (All campgrounds)[8]	382	—	167,774		86,391	53 percent	85,262		56,023	68 percent

Recreation Sites	No. of Sites/ Spaces	Turnover Rate (DUAs Only)[3]	MANAGED USE SEASON[1]				PEAK MONTH[2]			
			Maximum Visitor Capacity[4]	Estimated Average No. of Daily Occupied Sites/Space[5]	Estimated Current Visitor Use[4]	Current Seasonal Occupancy (percent)	Maximum Visitor Capacity[4]	Estimated Average No. of Daily Occupied Sites/Space	Estimated Current Visitor Use[4]	Current Peak Month Occupancy (percent)
Developed Day Use Sites[9]										
Boat Launches										
Lake Almanor	Parking									
Almanor Boat Launch	53	2	29,744	52	14,591	49 percent	15,116	54	7,700	51 percent
Canyon Dam Boat Launch/DUA	64	3	53,875	190	53,314	99 percent	27,379	217	30,944	113 percent
Subtotal			83,619		67,905	81 percent	42,495		38,644	91 percent
Picnic/Rest Areas										
Lake Almanor										
Almanor Rest Area (SR 89)	15	2	8,418	6	1,684	20 percent	4,278	6	856	20 percent
Almanor Beach	42	5	58,926	109	30,585	52 percent	29,946	126	17,968	60 percent
Dyer View DUA	13	3	10,943	12	3,367	31 percent	5,561	16	2,282	41 percent
Eastshore DUA	20	1	5,612	7	1,964	35 percent	2,852	5	713	25 percent
Almanor Scenic Overlook	30	1	8,418	5	1,403	17 percent	4,278	5	713	17 percent
Canyon Dam DUA	45	3	37,881	88	24,693	65 percent	19,251	85	12,121	63 percent
Subtotal			130,198		63,696	49 percent	66,166		34,653	52 percent
Butt Valley Reservoir										
Alder Creek DUA/Boat Launch	20	5	28,060	69	19,361	69 percent	14,260	64	9,126	64 percent
Bypass Reaches										
Belden Rest Stop (SR 70)	15	12	50,508	25	7,015	14 percent	25,668	44	6,274	24 percent
Total	317		292,385		157,978	54 percent	148,589		88,697	60 percent
GRAND TOTAL[8]			460,159		244,369	53 percent	233,851		144,720	62 percent

[1] *Managed use season defined as all days (weekdays and weekends) from mid-May through mid-September.*

[2] *Peak months defined as all days (weekdays and weekends) in July and August.*

[3] *Turnover rates for DUAs based on traffic counter data, on-site observations, and professional judgement. For maximum capacity purposes, turnover rates were used for all DUAs to calculate Theoretical Seasonal and Peak Month Capacity. A turnover rate is defined as the number of times during a day that new vehicles replace ones that have left a parking area. Validation counts were performed in the summer of 2002 to confirm the turnover rates. The turnover rates used in this analysis were determined to be reasonable based on validation counts at the Eastshore DUA, Canyon Dam DUA, Canyon Dam Boat Launch/DUA, Almanor Beach, and Dyer View DUA.*

[4] *Assumes an average of 3.6 persons per campsite and 2.3 persons per vehicle per day per 2001 survey results. Number of visitors are in recreation days (any length of stay per day) per FERC Form 80 requirements.*

[5] *Estimated average number of sites occupied at campgrounds were provided by the Licensee, Forest Service, or based on user counts taken during 2001 by EDAW. Estimated average number of spaces occupied at DUAs was derived from traffic counter readings and manual traffic counts. This increased percentages from 1 to 6 percent. In 2001, pool levels at Lake Almanor were lower than normal and may have contributed to lower recreation days at the Almanor Boat Launch and higher recreation days at Canyon Dam Boat Launch/DUA.*

[6] *3 year (1999, 2000, and 2001) average daily occupancies were used for Last Chance, Almanor, Lake Almanor, Ponderosa Flat, and Cool Springs Campgrounds. Pre-2001 data for the bypass reach campgrounds was not provided by the Forest Service.*

[7] *Camp Conery is a group facility, which can accommodate up to 50 people at one time. It is rented primarily on weekends. In 2001, Camp Conery was rented 13 out of 15 (87%) weekends that it was open to the public and all weekends during the peak season.*

[8] *Last Chance Campground and Camp Conery Group Camp not included in the average and are assessed individually. Last Chance Campground is included in all other subtotals/totals.*

[9] *Traffic counter data was used for the following sites: Almanor Boat Launch, Almanor Beach, Canyon Dam Boat Launch/DUA, and Canyon Dam DUA. Manual counts were used as a basis for all other DUAs.*

Source: EDAW, Inc.

Seasonal and peak month occupancies were also determined by recreation resource area (Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches) and by facility type (campgrounds, boat launches, and picnic/rest areas). This was done to accommodate for the fact that when one recreational facility in an area reaches capacity, other recreational facilities in the same area may have capacity to absorb the additional use. DUA seasonal and peak month occupancies were only determined for the Lake Almanor recreation resource area, as Butt Valley Reservoir and the Project reaches had only one developed day use site each.

Belden and Seneca Reaches had the highest campground seasonal occupancy rate (60 percent) of the three recreation resource areas (see Table E5.2.5-2). Lake Almanor and Butt Valley Reservoir had occupancy rates of 53 percent and 45 percent, respectively, for the season. Peak month occupancy rates are higher for each recreation resource area with Lake Almanor having the highest occupancy rate (70 percent) and Butt Valley Reservoir having the lowest occupancy rate (57 percent). Occupancy rates by recreation resource area are important for planning purposes because they incorporate the redistribution of visitors when certain campgrounds are at capacity. This redistribution of use can prolong the time it takes for a site to reach capacity, but can also decrease the time for other sites to reach capacity.

Unlike campgrounds, day use sites are generally used for shorter periods of time (a few hours or less) and typically during good weather conditions (picnicking, swimming, and sunbathing typically require warm sunny days). As a result, utilization of day use sites

tends to be lower during the season, but higher during peak months, as compared to campgrounds. These sites are typically lightly used during most of the year, with the exception of warm, sunny days when they are more heavily utilized. A primary concern for DUAs is to have adequate parking and other facilities for these brief peak periods of time. Based on seasonal and peak month occupancy, day use sites in total are being utilized at 54 percent of their seasonal and 60 percent of their peak month capacity (see Table E5.2.5-2). The seasonal level of use at day use sites fall within the "approaching capacity" level, while the peak month level is considered to be below capacity.

At Lake Almanor, seasonal utilization of boat launches was 81 percent and was considered to be above capacity for planning purposes. Utilization rose to 91 percent during peak months. This utilization level is also considered to be exceeding capacity. Use of other day use picnic/rest areas at Lake Almanor was 49 percent during the season and 52 percent during peak months. The seasonal utilization level at Lake Almanor DUAs is considered to be approaching capacity, while the peak month utilization level is considered below capacity.

A theoretical maximum seasonal capacity of approximately 460,159 visitors for all developed public (Licensee and Forest Service) recreation sites in the Project area was determined based on 100 percent utilization of all public developed campsites and parking spaces during the recreation season. An estimate of actual utilization is approximately 244,369 for the Project area. This equates to an overall seasonal

utilization of all sites (campgrounds and DUAs) of 53 percent. This overall level of use is considered to be approaching capacity for the broader study area.

The Project area is located at a high altitude in the mountains (approximately 4,500 feet) and experiences a relatively short summer season. As a result, its use pattern is significantly affected by temperature and rainfall/snowfall. Due to these use patterns, peak month (July and August) usage, not just seasonal, is also critical to planning site capacity. A theoretical maximum capacity of approximately 233,851 visitors per peak months for all developed recreation sites in the Project area was also determined based on 100 percent utilization. An estimate of actual peak month utilization is approximately 144,720 visitors. This equates to an overall peak month utilization of 62 percent (see Table E5.2.5-2). This overall level of use is considered to be below capacity.

Utilization of maximum theoretical capacities of 100 percent, while important for determining the maximum possible visitors to the Project area during the season and peak months, is not very useful as a day-to-day decisive management tool. Management actions would be necessary long before recreation facility use reached 100 percent capacity to plan potential expansion or take other non-construction management actions to avoid impacts related to crowding and facility overuse. For this study, a 60 percent seasonal capacity level was used as a threshold for campgrounds, DUAs, and boat launches. Additionally, an 80 percent peak month capacity level was used for campgrounds, boat launches, and DUAs. A third threshold level was also used for all recreation facilities in the Project area. Fifteen percent of season days over 90 percent

capacity was used as this third capacity threshold. Table E5.2.5-3 displays the three capacity thresholds for each public developed recreation facility in the Project area, as well as which capacity threshold (if any) is currently met or exceeded.

It should be noted that capacity related management actions should not be based on one year's worth of data that indicates occupancies exceed either seasonal or peak month capacity. A trend should be established and identifiable based on 3 out of 5 years hitting the capacity trigger before capacity related management actions are taken.

The Project area experienced drought conditions in 2001 and a severe forest fire in 2000, both of which affected use levels. A multi-year trend is needed to account for these types of influences on use levels.

As shown in Table E5.2.5-3, seasonal utilization is currently exceeding 60 percent at three DUAs: Canyon Dam Boat Launch/DUA, Canyon Dam DUA, and Alder Creek DUA/Boat Launch. This level of seasonal use is very high; however, other indicators should be considered before final capacity conclusions are made. Utilization at all other day use sites is considered to be either below or approaching capacity. Peak month utilization is currently exceeding 80 percent at only one DUA, Canyon Dam Boat Launch/DUA. Utilization at all other day use sites is considered to be either below or approaching the peak month capacity.

Table E5.2.5-3
Public Developed Recreation Facilities in the Project Area and Their Capacity Thresholds

Recreation Sites	Capacity Indicator 1 Seasonal Occupancy Rate[1] (percent)	Capacity Indicator 2 Peak Month Occupancy Rate[2] (percent)	Capacity Indicator 3 No. of Days/Percentage 90 Percent Occupancy Rate was Exceeded During Season	Capacity Indicator Currently Met or Exceeded
Developed Campgrounds				
Lake Almanor				—
Last Chance Campground	44	44	8/7	—
Almanor Campground	46	61	14/11	—
Lake Almanor Campground	58	77	28/22	Indicator 3
Camp Conery Group Camp	87	100	—	Indicators 1 and 2
Subtotal[3]	**53**	**70**	—	—
Butt Valley Reservoir				
Ponderosa Flat Campground	51	61	8/6	—
Cool Springs Campground	35	49	4/3	—
Subtotal	**45**	**57**	—	—
Bypass Reaches				
Queen Lily Campground	58	67	18/14	—
North Fork Campground	55	65	17/14	—
Gansner Bar Campground	64	71	34/27	Indicators 1 and 3
Subtotal	**60**	**67**	—	Indicator 1
Total[3]	**53**	**68**	—	—
Developed DUAs				
Boat Launches				
Lake Almanor				
Almanor Boat Launch	49	51	7/6	—
Canyon Dam Boat Launch/DUA	99	113	19/15	Indicators 1, 2, and 3
Subtotal	**81**	**91**	—	Indicators 1 and 2

Recreation Sites	Capacity Indicator 1 Seasonal Occupancy Rate[1] (percent)	Capacity Indicator 2 Peak Month Occupancy Rate[2] (percent)	Capacity Indicator 3 No. of Days/Percentage 90 Percent Occupancy Rate was Exceeded During Season	Capacity Indicator Currently Met or Exceeded
Picnic/Rest Areas				
Lake Almanor				
Almanor Rest Area (SR 89)	20	20	—	—
Almanor Beach	52	60	9/7	—
Dyer View DUA	31	41	—	—
Eastshore DUA	35	25	—	—
Almanor Scenic Overlook	17	17	—	—
Canyon Dam DUA	65	63	7/6	Indicator 1
Subtotal	**49**	**52**	—	—
Butt Valley Reservoir				
Alder Creek DUA/Boat Launch	69	64	10/8	Indicator 1
Bypass Reaches				
Belden Rest Stop (SR 70)	14	24	37/30	Indicator 3
Total	**54**	**60**	—	—
GRAND TOTAL[3]	**53**	**62**	—	—

[1] Average occupancy rate during the recreation season (mid-May through mid-September).

[2] Average occupancy rate during the peak months of July and August.

[3] Camp Conery Group Camp not included.

Source: EDAW, Inc.

In addition to reporting occupancy at individual DUAs, recreation resource areas were also examined. The Butt Valley Reservoir and the Belden and Seneca Reaches resource areas only have one DUA each and thus were not included in the recreation resource area occupancy analysis. Projected occupancies by resource area are important for planning purposes because they incorporate the redistribution of visitors when certain day use sites are at capacity. This redistribution of use can prolong the time it takes for a site to reach capacity, but can also decrease the time for other sites to reach capacity.

At Lake Almanor, boat launches were analyzed separately, as they represent a demand for specific boating-related activities. The boat launches on Lake Almanor are currently exceeding their seasonal and peak month occupancy thresholds. The remaining DUAs on Lake Almanor, examined in total, received relatively low use levels and are considered approaching capacity for the season and below capacity during peak months.

It should be noted that peak month utilization of the Almanor Boat Launch (Forest Service) was likely lower than normal because the boat ramp was unusable due to low pool levels for much of August and September due to the drought and resulting low pool levels. Conversely, peak month utilization of the Canyon Dam Boat Launch/DUA was likely higher than normal, as this site probably absorbed some of the use from the Almanor Boat Launch and other private boat launches.

As shown in Table E5.2.5-3, seasonal utilization is currently exceeding 60 percent at two campgrounds: Camp Conery Group Camp and Gansner Bar Campground. This level of

seasonal use is very high; however, other indicators should be considered before final capacity conclusions are made. Utilization at all other campgrounds was considered either below or approaching capacity. Peak month utilization exceeded 90 percent at only one campground: Camp Conery Group Camp. Utilization at all other campgrounds was considered either below or approaching the peak month capacity. Additionally, there are two campgrounds that exceeded the third capacity indicator (15 percent of season days exceeding 90 percent capacity): Lake Almanor Campground and Gansner Bar Campground.

In addition to reporting occupancy at individual campgrounds, recreation resource areas were also examined. Projected occupancies by resource area are important for planning purposes because they incorporate the redistribution of visitors when certain day use sites are at capacity. This redistribution of use can prolong the time it takes for a site to reach capacity, but can also decrease the time for other sites to reach capacity.

Use levels at two of the recreation resource areas (Lake Almanor and Butt Valley Reservoir) are relatively low and considered to be below or approaching both the seasonal and peak month capacity. Campground use levels at the Bypass Reaches are considered to be at capacity for the season, but below capacity for peak months.

E5.2.5.4.1.2 Private Commercial Resorts (Open to the Public)

Private commercial resorts play a significant role in providing public recreational opportunities in the Project area. Of the 31 private facilities in the Project area, 19 (61

percent) operate as private commercial resorts that are open to the public. This group of facilities is of interest in this study because they serve the general public. The remaining private facilities include six "private residential facilities" that are closed to the public and six other "private recreation facilities" that are closed to the public (see Figure E5.1-3). Private commercial resorts are generally open to the public for daily/weekly use for a fee whereas private residential facilities are longer-term (i.e., summer, yearly) cabin/condo–type leases.

Phone interviews were attempted with the 19 private commercial resorts (open to the public) in the Project area to gather capacity and occupancy information. Seven (37 percent) of these private commercial resorts agreed to participate in the interviews (see Section E5.2.1—Questionnaire Survey for more detail). Table E5.2.5-4 displays capacity and occupancy for the 19 private commercial resorts included in this analysis.

The total capacity of all private commercial resorts (includes all types of sites) in the Project area is nearly double that of public campgrounds (see Table E5.2.5-4). The average seasonal occupancy of private resorts that responded (72.3 percent) is also higher than public campgrounds (53 percent), indicating a higher level of use.

Table E5.2.5-4
Capacity and Occupancy of Private Commercial Resorts in the UNFFR Project Vicinity

Private Commercial Resorts	Capacity #	Type	Seasonal Occupancy[1] (percent)	Memorial Day to Labor Day Occupancy (percent)
Big Cove Resort	43	35 RV, 8 cabins	96.7	100
Caribou Corners[2]	—		—	—
Cashman's Paul Bunyan Resort	—		—	—
Dorado Inn	27	7 cabins, 20 rooms	66.7	95.0
High Sierra Resort	10	10 RV	—	—
Knotty Pine Resort	10	6 cabins, 4 RV	70.7	92.0
Lake Almanor Resort	17	14 rooms, 3 cabins	—	—
Lake Cove Resort	97	51 tent, 46 RV	—	—
Lake Haven Resort	10	10 cabins	83.3	95.0
Lassen View Resort	64	13 tent, 51 RV	62.0	96.0
Little Norway Resort	12	11 cabins, 1 RV	46.7	60.0
Miller's Resort	2	2 RV	—	—
Moonspinners Resort	8	4 RV, 4 rooms	—	—
North Shore Campground	120	120 tent/RV	—	—
Novotny's	3	3 rooms	—	—
Plumas Pines Resort	80	8 cabins, 9 rooms, 63 RV	80.0	100
Swim Inn	—		—	—
Vagabond Resort	2	2 cabins	—	—
Wilson's Camp Prattville	39	5 cabins, 34 RV	—	—
Total	**632**	**Average**	**72.3**	**91.1**

[1] *Season defined as days when sites were open to the public.*

[2] *Capacity information could not be determined for three private resorts including Caribou Corners, Cashman's Paul Bunyan Inn, and Swim Inn. Additionally, occupancy data was not obtained from 12 private resorts.*

Source: EDAW, Inc.

E5.2.5.4.2 Recreation Capacity by Recreation Facility

E5.2.5.4.2.1 Lake Almanor

This section discusses recreation capacity at each of the developed recreation facilities at or near Lake Almanor included in the study area (see Figure E5.1-1). For each facility, four types of recreation capacity are discussed, as well as a conclusion indicating whether use levels have exceeded the recreation capacity at that site. The limiting factor(s) to recreation capacity at each facility are also identified.

In 2001, survey data were gathered at each recreation facility in the Project area on social capacity via on-site surveys. Complete results of these surveys are detailed in a separate study report (Questionnaire Survey—Section E5.2.1). Specific survey results pertaining to perceived crowding are presented in this analysis. Results for individual recreation facilities are presented below. The average crowding score for all visitors surveyed at Lake Almanor was 3.5, on a scale from 1 to 9 with 9 representing "extremely crowded." This number (3.5) is considered to be approaching, but not exceeding, capacity. Approximately 720 individuals surveyed (83 percent) at Lake Almanor reported that crowding at recreation facilities was less or about what they expected.

Only 11 percent (94 out of 861) of individuals surveyed at Lake Almanor felt that the recreation facilities were more crowded than they expected. Results from individual sites (both reservoirs and the bypass reaches) are presented in Table E5.2.5-5 and discussed in more detail below for each site.

Recreation Sites

Recreation sites at Lake Almanor include Last Chance Campground, Almanor Boat Launch, Almanor Beach, Almanor Campground (North and South), Almanor Rest Area (SR 89), Dyer View DUA, Lake Almanor Campground (Loops 1, 2 and 3), Canyon Dam Boat Launch/DUA, Eastshore DUA, Almanor Scenic Overlook, Canyon Dam DUA, and Camp Conery Group Camp. Overall capacity conclusions for each of these sites are summarized below, based on a review of the four capacity types.

Table E5.2.5-5
Perceived Crowding at Project Area Recreation Sites

Site	Crowding Score[1]	Overall Social Capacity
Lake Almanor		
Almanor Boat Launch	4.5	At
Lake Almanor Campground (Loops 1, 2, and 3)	4.2	At
Canyon Dam Boat Launch/DUA	3.5	Approaching
Almanor Beach	3.4	Approaching
Almanor Campground (North and South)	3.2	Approaching
Last Chance Campground/Group Camp	2.9	Approaching
Dyer View DUA	2.7	Below
Camp Conery Group Camp	2.4	Below
Canyon Dam DUA	2.2	Below
Almanor Rest Area	NA[2]	—
Eastshore DUA	NA	—
Almanor Scenic Overlook	NA	—
Butt Valley Reservoir		
Ponderosa Flat Campground	4.3	At
Cool Springs Campground	3.7	Approaching
Alder Creek DUA/Boat Launch	2.8	Below
Project River Reaches		
Queen Lily Campground	4.4	At
Gansner Bar Campground	3.7	Approaching
North Fork Campground	3.4	Approaching
Belden Rest Stop	NA	—
Reservoirs and Reaches (Land-Based)		
Butt Valley Reservoir	4.1	At
Project River Reaches[3]	3.8	Approaching
Lake Almanor	3.5	Approaching
Reservoirs and Reaches (On-Water)		
Lake Almanor	3.2	Approaching
Project River Reaches[3]	3.2	Approaching
Butt Valley Reservoir	2.9	Approaching
Project Area Total	**3.5**	**Approaching**

[1] *Based on a crowding scale of 1 to 9 (Shelby and Heberlein 1986).*

[2] *NA = no data collected at site or less than five respondents.*

[3] *Primarily Belden Reach, as very few surveys were completed for Seneca Reach.*

Source: EDAW, Inc.

Last Chance Campground/Group Camp. Last Chance Campground/Group Camp is a Licensee-operated facility located north of Lake Almanor approximately 3 miles north of the town of Chester. The facility is divided into two units: a family campground area with 12 campsites, and a group camp with 13 campsites. When the family campground sites are fully occupied, the group camp is also used as a family campground, provided that it has not been rented. Activities at this campground include camping, resting/relaxation, fishing, horseshoes, volleyball, and group activities.

- Ecological Capacity—There is little in the way of ecological concerns at this facility. There are small areas of bare ground and compaction around picnic tables and fire rings. However, downed wood in the area has been cleared. An adjacent creek is a concern, however, current use is not significantly impacting this resource. Overall, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is located in a relatively flat area adjacent to Last Chance Creek. Some potential exists for expansion of the existing facilities across the creek while still allowing a buffer; therefore, physical/spatial capacity is not considered a limiting factor at this facility.
- Facility Capacity— On a seasonal basis, capacity utilization at this site was 44 percent. Utilization was also 44 percent during the peak months of July and August and 96 percent for holidays. During the 2001 season, seasonal occupancy was greater than 90 percent eight times (7 percent). This site is considered to be approaching capacity during the recreation season, but below capacity during peak months.

- Social Capacity—Visitor perceptions of crowding at this site are lower than the average for all visitors surveyed at Lake Almanor (3.5) and lower than the average for all visitors in the Project area (3.6). The average perceived crowding score among visitors to this site was 2.9 (see Table E5.2.5-5). This is lower than the average for all sites at Lake Almanor (3.5) and indicates that visitors are only beginning to feel slightly crowded. Overall, social capacity is considered to be approaching capacity but is not currently a limiting factor at this site.
- Site Level Capacity Conclusion—Recreational use of this site is approaching capacity during the recreation season and below capacity during peak months (July and August), but exceeds capacity during holidays.

With only 12 campsites, facility capacity is currently the limiting factor, particularly during holidays, when the group camp is often used as overflow. Ecological, physical/spatial, and social capacities are not considered limiting factors at this site.

Almanor Boat Launch. The Forest Service-managed Almanor Boat Launch is located on the west shore of Lake Almanor just off SR 89 adjacent to Almanor Campground North. This facility is one of two public, no fee developed boat launches at the lake. Built in 1973, the facility offers opportunities for boating and fishing access. The primary facility at this site is the boat launch, which has two steep, concrete ramp lanes and a wooden courtesy dock.

The Forest Service has recently received a California Department of Boating and Waterways (Cal Boating) grant to resurface the boat launch, add two courtesy docks, repave parking areas, widen access roads, construct two Americans with Disabilities Act (ADA) accessible restrooms, improve the sewer system, and improve signs. Work is expected to occur in 2003.

- Ecological Capacity—This fully developed facility has few ecological concerns. However, there are several small areas of bare ground and compaction near the restroom and boat ramp and along the edges of the parking area. In addition, a small area of erosion along the edges of the ramp access road was observed. Overall, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is located directly south of a large, open, flat area along the shoreline of Lake Almanor; therefore, there is opportunity for physical expansion of the existing facilities. Overall, physical/spatial capacity is not considered a limiting factor at this site.
- Facility Capacity—Facility capacity at the Almanor Boat Launch, and the other day use sites in the Project area, is focused on the availability of parking spaces. On a seasonal basis, capacity utilization of this site was at 49 percent. The utilization rose slightly during peak months to 51 percent (see Table E5.2.5-3). Additionally, utilization of this site exceeded 90 percent on 7 days (6 percent). Peak utilization of the Almanor Boat Launch was likely lower than normal because the boat ramp was unusable due to low pool levels for much of August. Overall, facility capacity is a limiting factor at this site for

two reasons: parking capacity and the inaccessibility of the boat ramp at lower pool elevations (toe of ramp is out of the water).

- Social Capacity—Visitor perceptions of crowding at this site are higher than at other sites in the study area, as well as higher than the average for all visitors surveyed at Lake Almanor. The average perceived crowding score among visitors to this site was 4.5, which is considered at capacity and is the highest of all of the sites in the study area (see Table E5.2.5-5). This is considerably higher than the average for all sites at Lake Almanor (3.5). This level of crowding indicates that visitors feel slightly to moderately crowded. However, only approximately 9 percent of visitors felt the Almanor Boat Launch was more crowded than they expected, indicating that most visitors expect larger crowds at this site. Overall, perceived crowding scores were higher at this site than at others in the Project area and are considered to be at capacity (between 4 and 6). Social capacity is considered to be a limiting factor at this site.

- Site Level Capacity Conclusion—Recreational use of this site falls within the approaching capacity level for the season and below capacity for peak months. A typical limiting factor for a site such as this would be facility capacity, particularly the number of available parking spaces. However, in the case of this site, the length of the boat ramp accounts for facility capacity being a limiting factor. During periods of lower pool elevations the toe of the boat ramp is out of the water, limiting the ability of visitors to launch boats. The Forest Service plans on renovating and reconstructing this site beginning in

2003. These improvements should help ease facility capacity concerns at this site. Physical/spatial capacity is not considered a limiting factor at this site. Perceived crowding scores indicate that this site is at capacity. Visitor perceptions of crowding are higher at this site than all other developed recreation sites in the Project area. As a result, social capacity is considered a limiting factor. Ecological capacity is not considered a limiting factor at this site.

Almanor Beach. The Forest Service-managed Almanor Beach is located on the west shoreline of Lake Almanor, adjacent to the Almanor Boat Launch. This site provides picnicking, sunbathing, boating, swimming, and fishing opportunities. The site includes a vault toilet and flush restroom, seven picnic tables, cooking grills, and a large swim beach with buoy safety line.

- Ecological Capacity—This developed facility has little in the way of ecological concerns. There are small areas of bare ground and compaction near the restroom and along some pedestrian travel routes. Overall, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is directly adjacent to the west shoreline of Lake Almanor and is bordered on the northwest by the Almanor Boat Launch. The area surrounding this facility is relatively flat. There is potential for additional parking areas along the access road to the facility and some expansion of existing picnic facilities between this facility and the

Almanor Boat Launch. Overall, physical/spatial capacity is not considered a limiting factor at this facility.

- Facility Capacity— On a seasonal basis, capacity utilization of this site was 52 percent. Utilization rose during peak months to 60 percent. Additionally, utilization of this site exceeded 90 percent on 9 days (7 percent). Overall, facility capacity is a limiting factor at this site, as available parking will likely be a constraint during the recreation season in the future.
- Social Capacity—Visitor perceptions of crowding at this site are somewhat similar to the average for all visitors surveyed at Lake Almanor and slightly below the average (3.6) for all recreation facilities in the Project area. The average perceived crowding score among visitors to this site was 3.4 (see Table E5.2.5-5). This is just below the average for all sites at Lake Almanor (3.5) and indicates that visitors feel slightly crowded and use levels are approaching social capacity. Overall, however, social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion— Recreational use of this site was approaching capacity during the season, but below capacity during peak month. Although the parking area was not fully utilized during the season, facility capacity will likely become a limiting factor during the season at this site in the future. Ecological, physical/spatial, facility, and social capacity are not considered limiting factors at this time.

Almanor Campground (North and South Units). These facilities are operated by the Forest Service and are located off SR 89 on the west shore of Lake Almanor. Activities include tent and RV camping, resting and relaxation, bank fishing, bicycling, and walking and hiking. The Lake Almanor Recreation Trail (LART) runs through the campground, providing opportunities for walking, hiking, and bicycling.

There are 49 campsites available on a first-come, first-served basis at Almanor Campground North and 53 campsites available on a first-come, first-served basis at Almanor Campground South (102 total campsites).

- Ecological Capacity—There are patches of bare ground in areas with high foot traffic, such as around picnic tables and toilets, and some small areas of erosion around campsites and along roads. In addition, downed wood in the area has been cleared. However, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—Both the North and South loops of Almanor Campground are located in a relatively flat area between SR 89 and the west shore of Lake Almanor. The Forest Service owns land surrounding the current site that could be considered for expansion of the existing facilities, including the land between the two loops on which several leased recreational residences are currently located. The Forest Service has indicated that planned future improvements at this facility would likely include the relocation of some cabins to the east to make room for expansion of the existing campground and day use facilities. Additional planned future

improvements include the relocation of Almanor Group Reservation Camp, currently located across SR 89, to an area near Almanor Campground North (Forest Service 2000a). Overall, physical/spatial capacity is not considered a limiting factor at this site.

- Facility Capacity—On a seasonal basis, capacity utilization of this site was 46 percent. Utilization of this site rose to 61 percent during July and August. Seasonal and peak month utilization of this site fell below the 60 percent seasonal and 90 percent peak utilization capacity thresholds. Utilization of this site exceeded 90 percent on 14 days (11 percent) during 2001. Overall, however, facility capacity is a limiting factor at this site in the long-term. The Forest Service plans to renovate and reconstruct the Almanor Campground (North and South). The goals of the reconstruction project are to add RV sites, create ADA-accessible sites, pave trails, and improve internal circulation. Increased public access to the shoreline would also be provided. These improvements will ease facility capacity concerns at this site.
- Social Capacity—Visitor perceptions of crowding at this site are lower than the average for all visitors surveyed at Lake Almanor. The average perceived crowding score among visitors to this site was 3.2 (see Table E5.2.5-5). This is lower than the average for all sites at Lake Almanor (3.5) and indicates that visitors feel slightly crowded. Overall, use levels are approaching social capacity and thus social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion—Current levels of recreational use at this site are approaching capacity during the recreation season and below capacity

during the peak months. The number of available campsites at this campground is a limiting factor in the long-term. The Forest Service plans on renovating and reconstructing this site to avoid facility capacity concerns, address ADA needs, and improve public health and safety. Ecological, physical/spatial, and social capacity are not considered limiting factors at this site.

Almanor Rest Area (SR 89). The Almanor Rest Area, also called the Almanor Picnic Area, is a Forest Service-managed day use site located approximately 10 miles south of the town of Chester, adjacent to SR 89. The Almanor Rest Area is situated between Almanor Group Reservation Camp and Almanor Overflow Camping Area. Built in 1965, this site serves primarily as a roadside rest stop.

- Ecological Capacity—Moderate ecological impacts are evident at this site. Most of the ecological impacts observed at this site are attributed to unconfined vehicle and pedestrian traffic in certain areas. There is a large area of bare soil and compaction due to vehicle traffic and camping. A forest fire also swept across this area in the past. Vehicle traffic has also caused some vegetation damage and areas of erosion. In addition, downed wood in the area has been cleared. Overall, ecological capacity is considered to be a limiting factor at this facility.
- Physical/Spatial Capacity—The Almanor Rest Area is situated between Almanor Group Reservation Camp and Almanor Overflow Camping Area.

When planned improvements are implemented, Almanor Group Reservation Camp will be relocated across SR 89 to an area near Almanor Campground North (Forest Service 2000a). This would provide significant physical space for expansion of Almanor Rest Area, if needed, and a much improved group facility. Overall, physical/spatial capacity is not a limiting factor at this facility.

- Facility Capacity—The Almanor Rest Area is a popular rest stop along SR 89. Much of the use at this site is from motorists who stop and use the restrooms at this site. Unlike many of the other developed recreation facilities, this site receives use year round due to its highway location (snow plowed during the winter). On a seasonal basis, capacity utilization of this site was 20 percent. The utilization of this site was the same during peak months. Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future. The Forest Service plans to renovate the Almanor Rest Area beginning in 2003. Planned renovations include redesigning and paving the parking area, developing individual picnic sites, and adding a kiosk and other interpretive facilities. Additionally, this site would be renamed Almanor Picnic Area. These improvements should help ease facility capacity concerns at this site.
- Social Capacity—Perceived crowding could not be determined because of limited surveys collected at the Almanor Rest Area.
- Site Level Capacity Conclusion—Being a popular roadside rest area, the number of available parking spaces is a limiting factor at this site. The Forest

Service plans on renovating this site beginning in 2003. The planned improvements should help ease facility capacity concerns. Unconfined vehicle use and pedestrian traffic are the primary causes of ecological impacts at this site. Erosion, vegetation damage, and a lack of down wood all make ecological capacity a limiting factor. Physical/spatial capacity is not a limiting factor at this facility. Although visitors' levels of perceived crowding were not calculated at this site, social capacity is not assumed to be a limiting factor due to the type of use this site receives (primarily short visits by motorists using the restrooms and/or picnic facilities).

Dyer View DUA. The new Forest Service-managed Dyer View DUA is located along the west shore of Lake Almanor. This facility functions as a trailhead and rest stop for the LART, as well as a shoreline beach DUA. Facilities include paved parking, interpretive signs, benches, and a vault toilet.

- Ecological Capacity—There is little in the way of ecological concerns at this facility. There are small areas of bare ground and compaction along some pedestrian travel routes leading to the shoreline. However, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is bordered on the north by Lake Almanor. While the shoreline prevents physical expansion of this site to the north and east, some potential exists for expansion of existing facilities to the south and west of this facility. Overall, physical/spatial capacity is not a limiting factor at this facility.

- Facility Capacity—On a seasonal basis, capacity utilization of this site was 31 percent. The utilization rose slightly during peak months to 41 percent. Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future.
- Social Capacity—Visitor perceptions of crowding at this site are lower than the average for all visitors surveyed at Lake Almanor (3.5) and lower than the average for all visitors in the Project area (3.6). The average perceived crowding score among visitors to this site was 2.7 (see Table E5.2.5-5). This is lower than the average for all sites at Lake Almanor (3.5) and indicates that visitors are only beginning to feel slightly crowded. Overall, use levels are below social capacity and thus social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion—Recreational use of this site is below both the seasonal and peak month capacity thresholds. In the long-term, however, the number of available parking spaces is a limiting factor. Ecological, physical/spatial, and social capacity are also not considered limiting factors at this site.

Lake Almanor Campground (Loops 1, 2, and 3). Lake Almanor Campground, managed by the Licensee, is located on the west shore of Lake Almanor. When originally built, this facility was three separate campgrounds. However, with several expansions, the three units were combined into one larger unit and the three loops interconnected years ago. Lake Almanor Campground was re-named in the late 1980s. Activities here include

camping, fishing, swimming, horseshoes, sunbathing, resting/relaxing, use of the LART, and boating. Loop 1, the northern-most campground loop, has 68 campsites including open, sparsely vegetated waterfront campsites as well as more forested inland campsites. Loop 1 also has 10 overflow campsites at the north end that are used during periods of peak usage. Loop 2, located in the middle, has 41 campsites and Loop 3, at the southern end, has 22 campsites. Loop 3 also has 19 overflow campsites at the southern end that are used during periods of peak usage.

- Ecological Capacity—While use levels and campsite density are high, there are few significant ecological concerns at this facility. There are many areas of bare ground along pedestrian travel routes and at heavily used campsites, and some small areas of erosion along pedestrian travel routes and at the edges of campsite spurs. In addition, downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is bordered on the east by Lake Almanor and on the west and south by SR 89. Potential exists for additional campsites to the north of Loop 1; however, physical limitations prevent significant expansion of Loops 2 and 3 due to the proximity of the shoreline and SR 89. Overall, physical/spatial capacity is a limiting factor at this facility.
- Facility Capacity—On a seasonal basis, capacity utilization of this campground was 58 percent. This utilization rose to 77 percent for the peak months of July and August. During the 2001 season, utilization of the

campground exceeded 90 percent on 28 days (22 percent). Overall, facility capacity is a limiting factor at this site.

- Social Capacity—Visitor perceptions of crowding at this site are higher than the average for all visitors surveyed at Lake Almanor (3.5) and higher than the average for all visitors in the Project area (3.6). The average perceived crowding score among visitors to this site was 4.2 (see Table E5.2.5-5), one of the highest perceived crowding scores of all recreation facilities in the Project area. Use levels are considered to be at the site's social capacity. This is considerably higher than the average for all sites at Lake Almanor (3.5) and indicates that visitors feel slightly to moderately crowded. Social capacity is a limiting factor at this time because perceived crowding scores are considered to be at the site's social capacity.
- Facility Level Capacity Conclusion—Seasonal recreation use of this site is approaching capacity, as is peak month utilization. In addition to having the highest peak month occupancy rate of all developed campgrounds in the Project area, utilization of this site exceeded 90 percent approximately 22 percent of the time during the season. Facility capacity is thus considered a limiting factor at this site. Perceived crowding scores indicate that this site is at the site's social capacity. Visitor perceptions of crowding are some of the highest in the Project area and social capacity is considered a limiting factor. The site has very limited expansion capability. As a result, physical/spatial capacity is a limiting factor. Ecological capacity is not considered a limiting factor at this site.

Canyon Dam Boat Launch/DUA. The Forest Service-managed Canyon Dam Boat Launch/DUA is located off SR 89 on the south end of Lake Almanor less than 1mile from Lake Almanor Dam. Primary activities at this site include boating and fishing access. Boating-related facilities at this site include a boat launch, which has two steep, concrete ramp lanes and a wooden courtesy dock.

Other day use recreation elements at this facility include a small picnic area with picnic tables and cooking grills and a large, paved parking area (with 13 single vehicle spaces and 51 vehicle with trailer spaces). There is also an adjacent cove that is a good fishing area. A paved, accessible fishing access trail has recently been constructed at this location. The Forest Service has recently submitted a grant to Cal Boating to replace a vault toilet, replace the courtesy dock, replace signage, install a water system, and extend the ADA accessible fishing walkway. A decision on this grant application is expected in 2002. Plumas County has already funded the extension of the LART (1.5 miles) to this site and construction documents are being prepared.

- Ecological Capacity—Moderate ecological impacts are evident at this facility. This site experiences some wind-driven wave and shoreline erosion user impacts. There is bare ground and compaction on the south side of the site and shoreline erosion on all sides of the site. In addition, vegetation along the shoreline on the south side of the site is beaten down. This site is within 300 feet of a wetland/riparian area to the south; however, there were no visible signs of public use impacts. Overall, ecological capacity is considered to be a limiting factor at this facility.

- Physical/Spatial Capacity—This facility is located to the north of a cove with a somewhat steep and narrow shoreline that prevents future expansion; however, the area to the north of the existing boat ramp is relatively open. Planned future improvements include the extension, from the north, of the LART to this site plus vehicle barriers and parking improvements. Some potential exists to the north of this facility for future facility expansion in addition to or in association with the planned trail extension. Overall, physical/spatial capacity is not considered a limiting factor at this site.
- Facility Capacity—Canyon Dam Boat Launch/DUA is one of two Forest Service-operated boat launches on Lake Almanor. This facility is popular with boaters, especially because the long boat ramps that provide access to the water during lower pool elevations when other boat ramps become unusable. On a seasonal basis, capacity utilization of this site was 99 percent. The utilization rose during peak months to 113 percent. Additionally, utilization of this site exceeded 90 percent on 19 days (15 percent). Facility capacity is considered a limiting factor at this site. Peak utilization of the Canyon Dam Boat Launch/DUA in 2001 may have been higher than normal, as this site could have absorbed some of the use from the nearby Almanor Boat Launch and private boat launches. Overall, facility capacity is a limiting factor at this site, especially during the peak season.
- Social Capacity—Visitor perceptions of crowding at this site are similar to the average (3.5) for all visitors surveyed at Lake Almanor and slightly below the average (3.6) for all recreation facilities in the Project area. The average

perceived crowding score among visitors to this site was 3.5 (see Table E5.2.5-5), which is considered to be approaching the site's social capacity. This is the average for all sites at Lake Almanor (3.5) and indicates that visitors feel slightly crowded. Overall, however, social capacity is not considered a limiting factor at this site.

- Site Level Capacity Conclusion—Current recreational use of this site is exceeding capacity during the season and peak months. The number of available parking spaces is a limiting factor at this site, especially during periods of lower pool levels when other boat launches are inoperative. Planned Forest Service improvements to this site should help ease current facility capacity concerns. This site shows signs of ecological impact including shoreline erosion, soil compaction, and vegetation damage. Ecological capacity is thus considered a limiting factor at this site. Social capacity and physical/spatial capacity are not considered limiting factors at this site.

Eastshore DUA. Eastshore DUA is a Licensee-operated facility located on SR 147 along the east shore of Lake Almanor. This site functions as a roadside rest and day use picnic area, with nine picnic tables and two vault toilets. Shoreline fishing at this site is possible; however, access is via a steep, undeveloped trail down to the water's edge. This site offers scenic vistas of Lake Almanor and Mt. Lassen.

- Ecological Capacity—There is evidence of some ecological impacts at this facility. There are areas of bare ground and compaction along pedestrian

travel routes and near picnic tables. There is also some erosion along the undeveloped trail leading to the shoreline, and the concrete foundations of some of the picnic tables on the downhill side are eroding. In addition, a moderate amount of litter scattered around the site was observed. Overall, however, ecological capacity is not considered a limiting factor at this facility.

- Physical/Spatial Capacity—This site is bordered on the west by Lake Almanor and on the east by SR 147. Steep topography limits potential expansion of existing facilities to the west and physical limitations prevent significant expansion of existing facilities to the east. However, the site could be expanded to the north and south parallel to the highway. Overall, physical/spatial capacity is not considered a limiting factor at this site.
- Facility Capacity—On a seasonal basis, capacity utilization of this site was 35 percent. The utilization actually decreased during peak months to 25 percent. Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future.
- Social Capacity—Perceived crowding could not be determined at this site because of insufficient visitor response.
- Site Level Capacity Conclusion—Current recreational use of this site is below capacity and thus facility capacity is not a limiting factor. This site is sandwiched between the Lake Almanor shoreline and SR 147, however, it could be expanded to the north or south. As a result, physical/spatial capacity is not a limiting factor. It is assumed that social capacity is not a limiting

factor at this site due to the low volume of visitors. Ecological capacity is not a concern at this site.

Almanor Scenic Overlook. This viewpoint site, managed by the Licensee, is located on SR 147 along the east shore of Lake Almanor near Lake Almanor Dam. The site provides a view of Lake Almanor Dam, Lake Almanor, and Mt. Lassen. There is a paved parking area and two vault toilets.

- Ecological Capacity—There is some evidence of ecological impacts at this facility. There is a small area of bare ground and compaction along the pedestrian travel route leading to the toilets. There is also erosion along the steep, user-defined trail leading to the shoreline. In addition, a moderate amount of litter was observed in the parking lot, near the toilets, and in adjacent vegetation. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This site is bordered on the west by Lake Almanor and on the east by SR 147. Steep topography limits potential expansion of existing facilities to the west and physical limitations prevent significant expansion of existing facilities to the east, north, and south. Overall, physical/spatial capacity is considered a limiting factor at this site.
- Facility Capacity—On a seasonal basis, capacity utilization of this site was 17 percent. The utilization of this site was the same during peak months. Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future.

- Social Capacity—Perceived crowding could not be determined at this site because of a low response rate.
- Site Level Capacity Conclusion—Current recreational use at this site is below capacity during the recreation season and peak months. The lack of available parking spaces would normally limit utilization, but facility capacity is not currently a limiting factor at this site, though may be in the future. Physical/spatial capacity, however, is a limiting factor due to the location of this site and topographic constraints. Ecological and social capacity are not considered limiting factors at this site.

Canyon Dam DUA. Canyon Dam DUA is a Licensee-operated facility located just east of Canyon Dam (also referred to as Lake Almanor Dam) along the north side of SR 89. This facility provides 19 picnic tables, cooking grills, and an undeveloped swimming beach. Other facilities at this site include two vault toilets and a circular drop-off and parking area with a separate parking lot located farther up-slope.

- Ecological Capacity—There is little in the way of ecological concerns at this facility. There are small areas of bare ground and compaction along some pedestrian travel routes and around picnic tables. In addition, a small amount of litter was observed throughout the facility. Overall, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is bordered on the north by Lake Almanor and on the south by SR 89. While the shoreline prevents physical expansion to the north, some potential exists for additional parking or DUAs

along the access road to the facility. In addition, some potential exists for expansion of the existing picnic facilities to the west of the facility. Overall, physical/spatial capacity is not a limiting factor at this facility.

- Facility Capacity—Facility capacity at this DUA is primarily related to the number of available parking spaces. On a seasonal basis, capacity utilization of this site was 65 percent. The utilization decreased slightly during peak months to 63 percent. Additionally, utilization of this site exceeded 90 percent on 7 days (6 percent). Facility capacity is currently a limiting factor at this site.
- Social Capacity—Visitors do not perceive significant levels of crowding at this site. The average crowding score for respondents at this site was only 2.2, the lowest of sites included in the Project area and lower than the average crowding score for all recreation facilities on Lake Almanor (see Table E5.2.5-5). Overall, social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion—Recreational use of this site is considered to be approaching capacity. Facility capacity is currently a limiting factor. Ecological, physical/spatial, and social capacity are not limiting factors at this site.

Camp Conery Group Camp. Camp Conery Group Camp is a Licensee–operated reservation-only group facility located east of Canyon Dam and inland from the reservoir approximately 0.25 mile. This facility accommodates groups of up to 50 persons and is

available to various organizations. Facilities include five bunk houses, an indoor/outdoor central group meeting and food service facility, a large campfire area, paved parking, a separate small RV group camping area, and a basketball area.

- Ecological Capacity—There is little in the way of ecological concerns at this fully developed facility. There are small areas of bare ground and compaction in the RV camping area and along pedestrian travel routes. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is located in a relatively flat area away from the Lake Almanor shoreline. While this facility is bordered on the west by a separate private RV campground, some potential exists for expansion of the existing facilities to the south and north. Overall, physical/spatial capacity is not considered a limiting factor at this facility.
- Facility Capacity—Camp Conery is a group facility, which can accommodate up to 50 PAOT. It is reserved primarily on weekends though is available for rental on weekdays. In 2001, Camp Conery was rented 13 out of 15 (87 percent) weekends that it was open to the public and all weekends during the peak season (see Table E5.2.5-2). Based on high utilization of this site, facility capacity is considered a limiting factor.
- Social Capacity—Visitors do not perceive significant levels of crowding at this site. The average crowding score for respondents at this site was only 2.4, the second lowest of sites included in the Project area and considerably lower than the average crowding score for all recreation facilities on Lake Almanor

(see Table E5.2.5-5). Overall, social capacity is not considered a limiting factor at this site.

- Site Level Capacity Conclusion—Current recreational use of this group site is at and/or exceeds capacity during the recreation season and peak months. Facility capacity is currently limited at this site because of this high level of use. Ecological, physical/spatial, and social capacity are not limiting factors at this site.

E5.2.5.4.2.2 Butt Valley Reservoir

This section discusses recreation capacity at each of the recreation facilities at Butt Valley Reservoir included in the study area (see Figure E5.1-1). For each facility, four types of recreation capacity are discussed, as well as a conclusion indicating whether use levels have exceeded the recreation capacity at that facility. The limiting factor(s) to recreation capacity at each facility are also identified. The average crowding score for all visitors surveyed at Butt Valley Reservoir was 4.1, on a scale from 1 to 9 with 9 representing "extremely crowded." In total, 178 out of 239 individuals surveyed (75 percent) at Butt Valley Reservoir reported that crowding at recreation facilities was less or about what they expected. Approximately one-quarter (22 percent, or 52 out of 239) of individuals surveyed at Butt Valley Reservoir felt that the recreation facilities were more crowded than they expected. Results for individual sites on Butt Valley Reservoir are presented in Table E5.2.5-5 and discussed in more detail below.

Recreation Sites

Recreation sites at Butt Valley Reservoir include Ponderosa Flat Campground, Alder Creek DUA/Boat Launch, and Cool Springs Campground. All of these sites are operated by the Licensee. Overall capacity conclusions for each of these sites area summarized below, based on the four capacity types.

Ponderosa Flat Campground. Ponderosa Flat Campground is located at the north end of Butt Valley Reservoir, on Prattville–Butt Reservoir Road (county road (CR) 305), approximately 4 miles south of SR 89. This facility has 61 campsites and an overflow or group camping area with 20 campsites. Activities at this site include camping, fishing, swimming, sunbathing, walking/hiking, relaxing/resting, and boating.

- Ecological Capacity—There is evidence of ecological impacts at this facility. Areas of bare ground and compaction occur around campsites with larger areas of bare ground in the overflow area. There are also some areas of erosion near campsites and along a dry creek bed. In addition, downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is situated in a large, flat area along the eastern shoreline of Butt Valley Reservoir. Potential exists for expansion of existing facilities to the south of the campground, as well as across Prattville–Butt Reservoir Road (CR 305), and near the existing overflow camping area. Overall, physical/spatial capacity is not a limiting factor at this facility.

- Facility Capacity—This Licensee-operated campground on Butt Valley Reservoir has 61 campsites. On a seasonal basis, capacity utilization of this site was 51 percent. Utilization rose during peak months to 61 percent. Additionally, utilization of this site exceeded 90 percent on 8 days (6 percent). This site is currently considered to be approaching capacity. Overall, facility capacity is not considered a limiting factor at this site.
- Social Capacity—Ponderosa Flat Campground received the third highest crowding score of all recreation facilities in the Project area. The average crowding score at this site was 4.3, slightly above the average (4.1) for all other recreation facilities at Butt Valley Reservoir and above the average (3.6) for all sites in the Project area (see Table E5.2.5-5). This level of perceived crowding is considered to be at the site's social capacity and indicates that visitors feel slightly to moderately crowded. Additionally, 25 percent of all visitors to Ponderosa Flat Campground felt that the site was more crowded than they expected. Overall, social capacity is considered a limiting factor at this site.
- Site Level Capacity Conclusion—Current recreational use of this site is approaching capacity during the season. Although utilization of this site is approaching capacity, facility capacity is currently not a limiting factor, but could be in the future. This site had one of the highest perceived crowding scores and social capacity is considered to be at capacity and a limiting factor. Physical/spatial and ecological capacity are not limiting factors at this facility.

Alder Creek DUA/Boat Launch. The Alder Creek DUA/Boat Launch is located along the east shore of Butt Valley Reservoir on Prattville–Butt Reservoir Road (CR 305), approximately 1mile south of Ponderosa Flat Campground. This facility provides three picnic sites, a single-lane concrete boat ramp, a vault toilet, and a paved parking area. There is no courtesy dock at this site. Activities include picnicking, boating, and fishing.

- Ecological Capacity—This site has few observed ecological impacts. Areas of bare ground, compaction, and erosion occur around the picnic sites. In addition, downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is situated on a flat area along the shoreline of Butt Valley Reservoir. Potential exists for some minor expansion of existing facilities both to the north and south of the existing boat ramp and along the access road to the facility or at another site nearby. Overall, physical/spatial capacity is not a limiting factor at this facility.
- Facility Capacity—This small day use site has the only developed boat launch on Butt Valley Reservoir. The number of available parking spaces and picnic tables could potentially limit use of this site. On a seasonal basis, capacity utilization of this site was 69 percent. Utilization decreased slightly during peak months to 64 percent. Additionally, utilization of this site exceeded 90 percent on 10 days (8 percent). The level of use may be attributed to Alder Creek being the only boat ramp on Butt Valley Reservoir. Overall, facility capacity is considered a limiting factor at this site.

- Social Capacity—Visitor perceptions of crowding at this site are lower than the average for all visitors surveyed at Butt Valley Reservoir (4.1) and lower than the average for all visitors in the Project area (3.6). The average perceived crowding score among visitors to this site was 2.8 (see Table E5.2.5-5), which is below the site's social capacity. This is lower than the average for all sites at Butt Valley Reservoir (4.1) and indicates that visitors are only beginning to feel slightly crowded. This is interesting considering that the site is heavily used during peak months. Also, visitors are only at the boat launch for a short time and likely perceive crowding levels to be lower because they also include their time out in a boat on the reservoir. Overall, social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion—Recreational use of this facility exceeds capacity. Facility capacity is thus a limiting factor. Ecological, physical/spatial, and social capacity are not considered limiting factors at this site.

Cool Springs Campground. Cool Springs Campground is located on Prattville–Butt Reservoir Road (CR 305) on the east shore of Butt Valley Reservoir approximately 2.5 miles south of Ponderosa Flat Campground. This facility has 30 campsites. Activities at this site include camping, fishing, resting/relaxing, sunbathing, walking/hiking, and swimming.

- Ecological Capacity—Ecological impacts at this facility are relatively low. However, there are areas of bare ground, compaction, and erosion at or near the picnic tables, and downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—This facility is situated on a flat area along the shoreline of Butt Valley Reservoir.

  Potential exists for expansion of existing facilities both to the north and south of the campground and along the access road to the facility. Overall, physical/spatial capacity is not a limiting factor at this facility.
- Facility Capacity—This facility is one of two Licensee-operated campgrounds on Butt Valley Reservoir. On a seasonal basis, capacity utilization of this site was 35 percent. The utilization rose during peak months to 49 percent. Additionally, utilization of this site exceeded 90 percent on 4 days (3 percent). Overall, facility capacity is considered a limiting factor at this site in the long-term.
- Social Capacity—Visitor perceptions of crowding at this site are below the average for all visitors surveyed at Butt Valley Reservoir (4.1) and slightly above the average (3.6) for all recreation facilities in the Project area. The average perceived crowding score among visitors to this site was 3.7 (see Table E5.2.5-5), which is considered to be approaching the social capacity of this site. This level is below the average for all sites at Butt Valley Reservoir (4.1) and indicates that visitors feel slightly crowded. Additionally, nearly 18 percent of visitors to Cool Springs Campground felt the site was more

crowded than they expected. Overall, however, social capacity is not considered a limiting factor at this site.

- Site Level Capacity Conclusion—Current use of this site is below capacity during the recreation season and peak months. Utilization of this site exceeded capacity on a few occasions. In the long-term, however, facility capacity is a limiting factor at this site. While this site experiences some ecological impacts, ecological capacity is not a limiting factor. Physical/spatial and social capacity are not considered limiting factors at this site.

E5.2.5.4.2.3 Belden and Seneca Reaches

This section discusses recreation capacity at each of the developed recreation facilities along the Project river reaches included in the study area (see Figure E5.1-1). For each facility, the four types of recreation capacity are discussed, as well as a conclusion indicating whether use levels have exceeded the recreation capacity at that facility. The limiting factor(s) to recreation capacity at each facility are also identified.

Overall, Belden and Seneca Reaches are very different from on another. Seneca Reach has no developed campgrounds, very few dispersed campsites, and less access in general due to steep terrain. Belden Reach, in comparison, has many more developed facilities, more dispersed campsites, and better access.

The average crowding score for all visitors surveyed at Belden Reach was 3.8 (approaching social capacity), on a scale from 1 to 9 with 9 representing "extremely crowded," (very few surveys were completed by Seneca Reach visitors). In total, 143 out of 173 individuals surveyed (83 percent) at Project river reaches reported that crowding at recreation facilities was less or about what they expected. Approximately 14 percent (24 out of 173) of individuals surveyed at the Project river reaches felt that the recreation facilities were more crowded than they expected.

Results for individual sites on Seneca and Belden Reaches are presented in Table E5.2.5-5 and discussed in more detail below.

Recreation Sites

Recreation sites along the Project area reaches include Queen Lily Campground, North Fork Campground, Gansner Bar Campground, and the Belden Rest Stop (SR 70). Overall capacity conclusions for each of these sites are summarized below, based on the four capacity types.

Queen Lily Campground. Queen Lily Campground is a Forest Service-operated facility located on the west branch of the North Fork Feather River (NFFR) along Caribou Road off of SR 70, 34 miles west of Quincy (see Figure E5.1-1). This facility provides 12 campsites, a flush restroom, and water faucets. This campground is more primitive and forested in appearance with no grassy area like the other campgrounds in this area.

- Ecological Capacity—This facility has little in the way of ecological concerns. There are some areas of bare ground in several of the campsites, as well as erosion occurring along user-defined trails near the river. In addition, downed wood in the area has been cleared. Overall, however, ecological capacity is not considered a limiting factor at this facility.
- Physical/Spatial Capacity—The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. In addition, this facility is directly north of North Fork Campground and just south of a small tributary of the river. Overall, physical/spatial capacity is considered a limiting factor at this facility.
- Facility Capacity—On a seasonal basis, capacity utilization of this site was 58 percent. The utilization increased during peak months to 67 percent. Additionally, utilization of this site exceeded 90 percent on 18 days (14 percent). This site is currently considered to be approaching capacity during the season and below capacity during peak months. Facility capacity is not considered a limiting factor at this time, but could be in the future.
- Social Capacity—The Queen Lily Campground received the second highest crowding score of all recreation facilities in the Project area. The average crowding score at this site was 4.4, above the average (3.8) for all other recreation facilities on the reaches and above the average (3.6) for all sites in the Project area (see Table E5.2.5-5). This level of perceived crowding is considered to be at the site's social capacity and indicates that visitors feel

slightly to moderately crowded. Additionally, approximately 22 percent of all visitors to the Queen Lily Campground felt that the site was more crowded than they expected. Overall, social capacity is considered a limiting factor at this site.

- Site Level Capacity Conclusion—Current use of this site is approaching capacity during the season. Capacity was exceeded on occasion during the season and peak months. However, facility capacity is not considered a limiting factor at this site. A limiting factor at this site is physical/spatial capacity. The expansion potential of this site is severely limited due to physical constraints surrounding the campground. Finally, visitor perceptions of crowding are higher at this site than at all others but one in the Project area and are considered to be at the site's social capacity. As a result, social capacity is a limiting factor. Ecological capacity is not a significant issue at this site.

North Fork Campground. North Fork Campground is also a Forest Service-operated facility located on the west branch of the NFFR along Caribou Road off of SR 70, 33 miles west of Quincy (see Figure E5.1-1). This facility provides 20 campsites, a flush restroom, and water faucets. This campground has large trees and an open grassy play area.

- Ecological Capacity—This facility has little in the way of ecological concerns. There are some areas of bare ground and compaction at many of the campsites. There is also some erosion occurring along user-defined trails

near the river. In addition, the downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.

- Physical/Spatial Capacity—The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. The area to the south of this facility, however, is relatively flat and is currently utilized as an undeveloped dispersed overflow camping area. Overall, physical/spatial capacity is not considered a limiting factor at this facility.
- Facility Capacity—On a seasonal basis, capacity utilization of this site was 55 percent. The utilization increased during peak months to 65 percent. Additionally, utilization of this site exceeded 90 percent on 17 days (14 percent). This site is considered to be approaching capacity during the season and below capacity during peak months. In the long-term, however, facility capacity is a limiting factor at this site.
- Social Capacity—Visitor perceptions of crowding at this site are below the average for all visitors surveyed at the reaches (3.8) and slightly below the average (3.6) for all recreation facilities in the Project area. The average perceived crowding score among visitors to this site was 3.4 (see Table E5.2.5-5), which is considered to be approaching the site's social capacity. This is below the average for all sites at Belden and Seneca Reaches (3.8) and indicates that visitors feel slightly crowded. Overall, however, social capacity is not considered a limiting factor at this site.

- Site Level Capacity Conclusion—Overall recreational use of this site is approaching capacity during the season. Facility capacity is a limiting factor in the long-term based on the number of available campsites. Ecological, physical/spatial, and social capacities are not currently considered limiting factors at this site.

Gansner Bar Campground. Located 32 miles west of the City of Quincy, Gansner Bar Campground is the third Forest Service-operated facility located on the west branch of the NFFR along Caribou Road off of SR 70 (see Figure E5.1-1). There are 14 campsites, a flush restroom, and an amphitheater at this facility. The campground has many trees and a large open grassy play area. In addition, a small picnic area is provided with an open grassy area, picnic tables, and cooking grills.

- Ecological Capacity—This facility has little in the way of ecological concerns. There are, however, some areas of bare ground and compaction along pedestrian travel routes between the campsites and the river. There is also some erosion occurring at user-defined trails near the river. In addition, downed wood in the area has been cleared. Overall, however, ecological capacity is not a limiting factor at this facility.
- Physical/Spatial Capacity—The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. The area to the north of this facility, however, is relatively flat and is currently utilized as an undeveloped

dispersed overflow camping area. Overall, physical/spatial capacity is not considered a limiting factor at this facility.

- Facility Capacity—On a seasonal basis, capacity utilization of this site was 64 percent. The utilization increased during peak months to 71 percent. Additionally, utilization of this site exceeded 90 percent on 34 days (27 percent)—the most days of any developed campground in the Project area. This site is currently considered to be at capacity.
- Social Capacity—Visitor perceptions of crowding at this site are below the average for all visitors surveyed at both reaches (3.8) and slightly above the average (3.6) for all recreation facilities in the Project area. The average perceived crowding score among visitors to this site was 3.7 (see Table E5.2.5-5), which is considered to be approaching the site's social capacity. This is just below the average for all sites at the reaches (3.8) and indicates that visitors feel slightly crowded. Overall, however, social capacity is not considered a limiting factor at this site.
- Site Level Capacity Conclusion—Current recreational use of this site is relatively high and considered to be at capacity. Ecological, physical/spatial, and social capacity are not considered limiting factors at this site.

Belden Rest Stop (SR 70). Belden Rest Stop is operated by the Licensee and is located adjacent to the downstream Belden Powerhouse on the north side of SR 70 in the Feather River Canyon (see Figure E5.1-1). This site has several functions including being a roadside rest, picnic area, trailhead, and interpretive site. Recreation elements at the

Belden Rest Stop include a picnic area, a small open pavilion with informational signs (damaged), two vault toilets, and a paved parking lot.

- Ecological Capacity—There is moderate evidence of ecological impacts at this facility. There are areas of bare ground near each of the trailheads and parking lot. There are also areas of erosion on the slope between the parking lot and upper picnic area, and at the small launch area. Erosion control measures are needed at these locations. Overall, however, ecological capacity is not considered a limiting factor at this facility.
- Physical/Spatial Capacity—The location of this facility adjacent to the downstream Belden Powerhouse and along SR 70 limits the potential for future expansion of this facility. In addition, steep topography further limits the potential for future expansion of this facility. Overall, physical/spatial capacity is considered a limiting factor at this facility.
- Facility Capacity—The Belden Rest Stop is a popular rest area along SR 70. Much of the use at this site is from motorists who stop and use the restrooms at this site or to stretch their legs. Approximately 35 percent of use at this site can be attributed to visitors to other Project-related recreation areas. Unlike many of the other developed recreation facilities, this site receives use year-round due to its highway location, which is plowed during the winter. On a seasonal basis, capacity utilization of this site was 14 percent. Utilization rose during peak months to 24 percent. This site is currently considered to be below capacity; however, facility capacity could be a limiting factor in the future based on the number of available parking spaces.

- Social Capacity—Perceived crowding could not be determined at this site because of insufficient visitor response.
- Site Level Capacity Conclusion—Current recreational use of this site is moderate and considered to be below capacity. This site is primarily used by motorists for short periods of time, but facility capacity could be a limiting factor in the future. The lack of expansion capability is a physical/spatial limiting factor. Ecological and social capacity are not currently considered limiting factors at this site.

E5.2.5.4.3 Recreation Capacity by Area

E5.2.5.4.3.1 Lake Almanor

This section summarizes the previous individual site level analyses for Lake Almanor to determine the overall level of capacity in this broader recreation resource area. The limiting capacity indicator(s) for the entire reservoir are identified.

Ecological Capacity

Ecological capacity is considered a limiting factor at four of the sites on Lake Almanor (Almanor Group Reservation Camp, Almanor Overflow Campground, Almanor Rest Area, and Canyon Dam Boat Launch/DUA). Ecological concerns include large areas of bare soil and compaction due to unconfined vehicle and pedestrian traffic in certain areas, proximity to sensitive creeks, vernal pools and riparian areas, raptor nest sites, and wave or user-caused shoreline erosion impacts. Overall, however, ecological capacity is not

considered a limiting factor at Lake Almanor since several other areas are potentially available.

Physical/Spatial Capacity

Only two of the facilities on Lake Almanor (Lake Almanor Campground and Almanor Scenic Overlook) are areas where physical/spatial capacity is a limiting factor.

In general, physical space for recreation development is adequate along the west shore of the lake; however, it is limited by steep topography and the proximity of SR 147 along much of the eastern shoreline. Overall, physical/spatial capacity on the land is not considered a limiting factor at Lake Almanor.

Facility Capacity

Facility capacity is a current or potential future limiting factor at most of the developed recreation sites at Lake Almanor. Specifically, two campgrounds, one boat launch, and two picnic/rest areas exceeded either the seasonal or peak month capacity thresholds.

Utilization of Camp Conery Group Camp exceeded the seasonal capacity threshold of 60 percent. Utilization of Gansner Bar Campground, Canyon Dam DUA, and Alder Creek DUA/Boat Launch also exceeded the seasonal capacity threshold of 60 percent. Additionally, both the seasonal and peak month capacity thresholds were exceeded at Canyon Dam Boat Launch/DUA.

While utilization of the Almanor Boat Launch does not exceed the seasonal or peak month capacity thresholds, facility capacity is a limiting factor at this site because the boat ramp is unusable during lower pool elevations. Facility capacity will likely be a limiting factor at most other developed recreation sites at Lake Almanor in the future as demand for these types of sites increases.

Social Capacity

The primary indicator of social capacity is visitors' perceptions of crowding. As described above, perceived crowding varies at the sites on Lake Almanor. The overall crowding score for visitors surveyed at Lake Almanor was 3.5, indicating that crowding perceptions are approaching the area's social capacity and visitors are feeling "slightly crowded." Overall, these results indicate that social capacity should not be considered a limiting factor at Lake Almanor.

Resource Area Capacity Conclusion

Overall, current recreational use of Lake Almanor is considered to be approaching capacity. This is a function of higher use levels at developed facilities including campgrounds and boat launches. High use at these sites is slightly offset by below capacity utilization at the remaining developed recreation sites. Of the four capacity types, facility capacity is the primary limiting factor on this reservoir.

E5.2.5.4.3.2 Butt Valley Reservoir

This section summarizes the previous individual site level analyses for Butt Valley Reservoir to determine the overall level of capacity in this broader recreation resource area. The limiting capacity indicator(s) for the entire reservoir are identified.

Ecological Capacity

Significant ecological impacts were not observed at any of the three sites at Butt Valley Reservoir. Overall, ecological capacity is not considered a limiting factor at Butt Valley Reservoir.

Physical/Spatial Capacity

All three sites on Butt Valley Reservoir (Cool Springs Campground, Ponderosa Flat Campground, and Alder Creek DUA/Boat Launch) are areas where physical/spatial capacity are not considered a limiting factor. Physical expansion area for potential new recreation development is available along the east shore of Butt Valley Reservoir.

Facility Capacity

Facility capacity is considered a limiting factor at all of the developed recreation sites at Butt Valley Reservoir. Utilization of the two campgrounds (Ponderosa Flat Campground and Cool Springs Campground) is below or approaching capacity while utilization of Alder Creek DUA/Boat Launch exceeds seasonal capacity. Overall, however, in the long-term, facility capacity is a limiting factor at Butt Valley Reservoir.

Social Capacity

The primary indicator of social capacity is the perception of crowding. As indicated above, perceived crowding is variable at the sites on Butt Valley Reservoir. The overall crowding score for visitors surveyed at Butt Valley Reservoir was 4.1, indicating that visitors feel slightly to moderately crowded (see Table E5.2.5-5) and that the area is generally at its social capacity level. This score is the highest of the three major Project areas. Additionally, nearly a quarter (22 percent) of visitors to Butt Valley Reservoir felt the recreation sites were more crowded than they expected. Overall, these results indicate that social capacity is at capacity and is considered a limiting factor at Butt Valley Reservoir.

Resource Area Capacity Conclusion

Overall, current recreational use of Butt Valley Reservoir is considered to be approaching capacity. Differing levels of capacity at Butt Valley developed recreation facilities help balance the total utilization of recreation areas at this reservoir. Of the four capacity types, facility and social capacities are limiting factors at Butt Valley Reservoir.

E5.2.5.4.3.3 Belden and Seneca Reaches

This section summarizes the previous individual site level analyses for the Project area river reaches to determine the overall level of capacity in this broader recreation resource area. The limiting capacity indicator(s) for the entire areas are identified.

Ecological Capacity

Significant ecological impacts were not observed at any of the sites along the reaches. Overall, ecological capacity is not considered a limiting factor. However, significant ecological impacts were observed at the undeveloped dispersed overflow camping areas near the three developed campgrounds.

Physical/Spatial Capacity

All but two (North Fork Campground and Gansner Bar Campground) of the sites along the reaches are areas where physical/spatial capacity are considered a limiting factor. Physical space for recreation development is limited largely due to topographical constraints.

Facility Capacity

Facility capacity is a current or potential future limiting factor at most of the developed recreation sites along Belden Reach. There are no developed recreation sites along Seneca Reach.

Social Capacity

The primary indicator of social capacity is the perception of crowding. As indicated above, perceived crowding is variable at the sites on the reaches. The overall crowding score for visitors surveyed was 3.8 (approaching social capacity), indicating that visitors feel slightly crowded (see Table E5.2.5-5). This score is the second highest of the three major Project areas. Overall, these results indicate that social capacity is not considered a limiting factor at Belden and Seneca Reaches.

Resource Area Capacity Conclusion

Overall, current recreational use of the Belden Reach is considered to be approaching capacity. This is a function of high use levels at Gansner Bar Campground and approaching capacities at the remaining developed recreation facilities on the Project reaches. On the Seneca Reach, there is very poor access and low use with significant physical/spatial constraints. Current recreational use is considered below capacity.

E5.2.5.4.3.4 Study Area Capacity Summary

Table E5.2.5-6 summarizes the site and resource area conclusions from this analysis. Overall, recreational use levels are approaching capacity for the recreation season as a whole.

During the peak summer months of July and August, recreation use levels at most sites are generally below or approaching capacity. Of the nine developed campgrounds assessed in this analysis, use levels at most sites (seven sites or 78 percent) were below or approaching their overall capacity level (see Table E5.2.5-6). Use at Camp Conery Group Camp currently exceeds its overall capacity. Of the 10 developed day use sites assessed in this study, use levels at two sites (20 percent) are currently exceeding their overall capacity (see Table E5.2.5-6). Utilization of the remaining eight day use sites is either below or approaching the overall capacity of the site.

Overall use levels are approaching capacity at the two reservoirs and Project river reaches (see Table E5.2.5-6). Table E5.2.5-6 also displays the capacity concern by site and reservoir. The capacity concern is based on the overall use level at the recreation site or

Table E5.2.5-6
Summary of Capacity and Limiting Factors at Recreation Sites and Reservoirs

Area	Limiting Factor(s)[1]	Overall Capacity Summary[2]	Capacity Concern[3]
Site Level			
Lake Almanor			
Last Chance Campground/Group Camp	Facility	Approaching	Moderate
Almanor Boat Launch	Facility and Social	Approaching	Moderate
Almanor Beach	Facility	Approaching	Moderate
Almanor Campground (North and South)	Facility	Approaching	Moderate
Almanor Rest Area	Ecological and Facility	Approaching	Moderate
Dyer View DUA	Facility	Below	Low
Lake Almanor Campground (Loops 1, 2 and 3)	Physical/Spatial, Facility, and Social	Approaching	Moderate
Canyon Dam Boat Launch/DUA	Ecological and Facility	Exceeds	High
Eastshore DUA	Facility	Below	Low
Almanor Scenic Overlook	Physical/Spatial	Below	Low
Canyon Dam DUA	Facility	Approaching	Moderate
Camp Conery Group Camp	Facility	Exceeds	High
Butt Valley Reservoir			
Ponderosa Flat Campground	Social	Approaching	Moderate
Alder Creek DUA/Boat Launch	Facility	Exceeds	High
Cool Springs Campground	Facility	Approaching	Moderate
Seneca and Belden Reaches			
Queen Lily Campground	Physical/Spatial, Social	Approaching	Moderate
North Fork Campground	Facility	Approaching	Moderate
Gansner Bar Campground	Facility	Approaching	Moderate
Belden Rest Stop	Physical/Spatial and Facility	Approaching	Moderate
Resource Area			
Land Area			
Lake Almanor	Facility	Approaching	Moderate
Butt Valley Reservoir	Facility and Social	Approaching	Moderate
Belden and Seneca Reaches	Physical/Spatial and Facility	Approaching	Moderate

[1]Indicates whether the capacity limiting factor(s) is based on facility, physical/spatial, ecological, and/or social constraints.

[2]Indicates whether the overall utilization is considered to be below, approaching, at, or exceeding capacity.

[3]Indicates whether the overall capacity is of high, moderate, or low concern.

Source: EDAW, Inc.

reservoir and should be used to prioritize potential management actions as they relate to capacity. Only three of the developed recreation sites included in this analysis are characterized as having a high capacity concern. These sites are Canyon Dam Boat Launch/DUA, Camp Conery Group Camp, and Alder Creek DUA/Boat Launch.

Of the remaining developed recreation sites, 13 are considered of moderate and three of low capacity concern. At the resource area level, Lake Almanor, Butt Valley Reservoir, and the Project river reaches are all of moderate capacity concern.

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E5.2.6 Shoreline Day Use Public Access Analysis

E5.2.6.1 Introduction

This section presents the results of the Shoreline Day Use Public Access Analysis, one of several recreation studies that were conducted by the Licensee for relicensing.

There are several ways that the public can access the Project shoreline areas for day use activities. Most visitors access the area at Lake Almanor by vehicle and then on foot. Public roadway access to Project reservoirs and the bypass reaches (Belden and Seneca) is generally close by. Roadway access is relatively good in and around the Lake Almanor area, which is accessed via state routes (SRs) 89, 36, and 147. However, some areas on Lake Almanor have limited or restricted vehicle access due to constraints. Butt Valley Reservoir is accessed via Butt Valley Road, a county road (CR), to the south of SR 89. The lower stretch of the Upper North Fork of the Feather River (UNFFR) is accessible to the public via Caribou Road, which runs parallel to Belden Reach and intersects with SR 70.

The upper Seneca Reach, however, has fairly restricted access due to the steep, rugged terrain. The Seneca Road, a Plumas County road, runs parallel to the river in this area; however, access to the river is generally by foot only, and the road is not close to the river except near the small community of Seneca.

Areas where public access is more limited include privately-developed areas along the shoreline of Lake Almanor that tend to restrict general public access, but do provide access for a number of private docks and residences along the shoreline area. Other areas with limited access include the shallow areas around Lake Almanor near Chester and adjacent shorelines that have been closed to keep people from driving out onto the shoreline, peninsula, or reservoir bed. Providing public access to these areas may conflict with existing land ownership and/or the need to protect sensitive cultural and ecological resources.

The public can also access many project shorelines by boat. Fluctuating or lower pool level elevations and typical shallow water levels make accessing certain shoreline areas on Lake Almanor and Butt Valley Reservoir difficult or impossible. Additionally, steep topography along Butt Valley Reservoir and Belden and Seneca Reaches limit the areas where a boat can be pulled-up onto shore. Despite these limitations, visitors to the Project area do access existing developed and dispersed recreation sites by boat.

E5.2.6.1.1 Objectives of the Study

The objectives of this study are to collect and analyze resource, facility, and land management information to identify the opportunities for and constraints on public access to Project shoreline areas and waters for day use activities. Key objectives of the study include ensuring that during the new license period the public has reasonable shoreline day use access to the Project's land and water areas while protecting sensitive resources and maintaining public safety.

To address these objectives, this study evaluates public versus private access to Project area shorelines, investigates the potential affect of future private development (if any) on public access, and determines if public access may be precluded in the future as a result of Project operations.

E5.2.6.1.2 Components of the Study

This study first presents results of an inventory of attributes. The study uses GIS technology to assess public access opportunities and constraints. GIS maps are presented as figures in this section. Additionally, the potential affects of future development and Project operations on public access are described. The section concludes with recommendations for potential actions to enhance public access in the Project area during the term of the new license.

E5.2.6.2 Study Area

The Project is located on the North Fork Feather River (NFFR) and Butt Creek, a tributary of the NFFR (see Figures E5.1-1 through E5.1-3). The Project is located in the northwest corner of Plumas County, approximately 70 miles northeast of the city of Chico and 90 miles northeast of the city of Oroville. The study area includes a 0.25-mile radius surrounding the two Project reservoirs, Lake Almanor and Butt Valley Reservoir, and two bypass reaches, Belden Reach and Seneca Reach.

Project recreation sites were categorized into Level 1 (greater detail provided) or Level 2 (lesser detail provided) based on the level of public access provided at each site.

Level 1 sites include Licensee and Forest Service developed public recreation facilities and use areas at Lake Almanor, Butt Valley Reservoir, and the bypass reaches (see Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Vicinity). These facilities are generally located within or adjacent (0.25 mile) to the Federal Energy Regulatory Commission (FERC) Project boundary.

Level 1 developed public recreation sites and use areas included in the study area are listed below.

Public Recreation Sites at or Near Lake Almanor

- Almanor Boat Launch/DUA (Forest Service)
- Almanor Campground (North and South units) (Forest Service)
- Almanor Group Camp (Forest Service)
- Almanor Overflow Camping Area (Forest Service)
- Almanor Beach (Forest Service)
- Almanor Rest Area (SR 89), also called Almanor Picnic Area (Forest Service)
- Canyon Dam DUA/Boat Launch (Forest Service)
- Camp Conery Group Camp (Licensee)
- Dyer View DUA (Forest Service)
- Eastshore DUA (Licensee)
- Lake Almanor Recreation Trail (LART) (Forest Service)
- Lake Almanor Campground (Loops 1, 2, and 3) (Licensee)
- Almanor Scenic Overlook (Licensee)
- Last Chance Campground/Group Camp (Licensee)

Public Recreation Sites at Butt Valley Reservoir

- Alder Creek DUA/Boat Launch (Licensee)
- Cool Springs Campground (Licensee)
- Ponderosa Flat Campground (Licensee)

Public Recreation Sites at or near Belden and Seneca Reaches

- Belden Rest Stop (SR 70) (Licensee)
- North Fork Fishing Trail (Forest Service)
- Gansner Bar Campground (Forest Service)
- North Fork Campground (Forest Service)
- Queen Lily Campground (Forest Service)

Level 2 recreation sites include private facilities and dispersed undeveloped shoreline and riverside day use and overnight sites (see Figures E5.1-2 and E5.1-3):

- 22 privately-owned and -operated recreation facilities including overnight facilities (cabins, recreational vehicle (RV) sites, etc.), boat launches, and marinas/slips; and
- Dispersed (undeveloped) shoreline (Lake Almanor and Butt Valley Reservoir) and riverside (Belden and Seneca Reaches) day use and overnight sites and trails.

E5.2.6.3 Methods

E5.2.6.3.1 Methodology for Public Access Inventory

Public access in the Project area was inventoried using a combination of existing inventory data, on-site visits, and GIS-based technology. Access was verified during field visits by driving on public roads and walking along formal and informal trails on land open to the public. Particular attention was paid to shoreline opportunities and constraints. GIS data layers and mapping were used to assess land ownership patterns; recreation facilities; formal and informal access parking areas, access roads and trails; and other access opportunities and constraints. Specific public access opportunities and constraints used in this assessment are listed below.

Public Access Opportunities

- Existing recreation sites (Licensee and Forest Service)
- Existing trails
- Existing roads
- Licensee-owned land (excluding Project hydroelectric facilities)
- Public-managed land
- Slopes of 0 to 40 percent (high opportunity=0–20 percent; moderate opportunity=20–40 percent)

Public Access Constraints

- Project hydroelectric facilities
- Non-Licensee private land

- Biological constraints
- Areas of shallow water depth
- Restricted areas (due to safety concerns)
- Slope greater than 40 percent (low opportunity)

GIS is a macro-scale approach and is not meant to replace on-the-ground assessment and siting techniques that may be used to develop specific protection, mitigation, and enhancement measures (PMEs). Slope analyses are limited due to available topographic data and interpolation. The goal is to provide resource/public access compatibility information and to identify areas for potential public access.

E5.2.6.3.2 Methodology for Public Access Assessment

Following the inventory of public access opportunities and constraints using GIS, existing data, and on-site investigations, public access criteria and ratings (high, moderate, low) were developed for the study area. Criteria for each rating are described in Table E5.2.6-1.

Maps depicting varying levels of public access were created by overlaying public access opportunity and constraint data layers. A composite of higher-ranked public access data layers and lower-ranked constraint data layers produced results showing that some areas are more suitable that others for existing and potential public access development.

Based on the criteria and ratings (high, moderate, and low) in Table E5.2.6-1 and the overlay maps, field checks were done, and summaries were prepared describing areas where it is expected that the public will have reasonable access to the shoreline for day use activities during the term of the new license.

The analysis considered, among other factors, shoreline areas accessible by vehicle and foot, and shoreline areas accessible by boat.

Table E5.2.6-1
Public Access Criteria and Ratings

Variable	High Public Access	Moderate Public Access	Lower Public Access
Land to Water Access			
Slope	0–20 percent	20–40 percent	>40 percent
Land Ownership	Licensee (non-Project facility) and Forest Service	—	Non-Licensee private
Recreation Sites	Licensee and Forest Service (Level 1 sites)	Dispersed sites and private resorts (Level 2 sites)	Private residential (membership only) sites
Roads	Existing	—	None
Trails	Existing	—	None
Biological Resources	No sensitive areas	Sensitive species habitat (nest location) buffer zones	Sensitive plant and wildlife species habitat (nest locations)
Project Hydroelectric Facilities	None	—	Existing
Water to Land Access			
Adequate for Powerboating	Unrestricted water depth and access	—	Known shallow areas; Restricted areas (around Project facilities)
Shoreline Boat Access	Year-round access, deep water	Access at full pool only, or low pool only, but not year-round	No access

Source: EDAW, Inc.

Private property development in the study area was investigated by communicating with area realtors and by reviewing new development proposals. Such efforts represent an attempt to better understand the study area's development potential on private lands, and how proposed private development could affect public access. This topic is further discussed in other sections.

Project operations in the study area were also evaluated to determine if public access would be affected by changes in operations. Any proposed new operational changes were noted and discussed.

Based on the results of these tasks, potential actions or proposals to enhance public access in the study area were recommended. Specific improvements and their associated estimated costs were identified and described.

Section E5.2.7—Recreation Suitability Analysis utilizes information from this section and identifies portions of the Project area which are suitable for potential new recreation and public access facilities to meet future needs.

E5.2.6.4 Results and Discussion

As part of FERC relicensing requirements, Licensees must provide reasonable and safe public access to Project-related shorelines and recreation areas.

An assessment of public shoreline access is necessary to determine if Project area residents and visitors have reasonable access, or if additional public access sites are necessary. Two major types of access were considered for this analysis including land-to-water access (road access and trail access) and water-to-land access. Americans with Disabilities Act (ADA) accessibility at existing recreation facilities and use areas was not considered for this analysis, but is addressed in detail in Section E5.1.4.

Existing recreation facilities and use areas that provide public access in the study area are owned and operated by both public and private entities including the Licensee, the Forest Service, private resort owners, and private residential communities with associated private recreation facilities along the shoreline. All public recreation facilities (those owned and operated by the Licensee and Forest Service) are open to the general public during established timeframes. However, private recreation facilities are either: open to the general public as a commercial venture (boat launches and resorts), or are owner- or membership-only (e.g., residential communities with shoreline recreation facilities). Private operators require a fee for use of a facility (boat launches at a resort), restrict use only to those visitors staying at the facility (i.e., patrons at a resort), or restrict use to homeowners or members (private residential areas). The fees private operators charge are generally slightly higher than Licensee and Forest Service fees and are discussed in more detail in the Recreation Facility and Condition Inventory (see Section E5.1.2). While private recreation facilities are discussed as areas of reduced public access in this study, they nonetheless play an important role in the overall public recreational opportunities at the Project area, particularly related to public boat launching and moorage.

Licensee policies currently govern private landholder and commercial developments and activities within the FERC Project boundary.

Private landowners and commercial developments may install docks, buoys, and other structures along the shorelines of the Project reservoirs as long as they meet Licensee requirements detailed in the *Lake Almanor Policy* (Licensee 1992) and the *Lake Almanor Commercial Policy* (Licensee 1997). Specific to this study, these policy documents contain information regarding vehicle access and public recreation access requirements. Outside of the FERC Project boundary, Plumas County and Forest Service regulations and requirements guide development and access.

In terms of motorized vehicle access, the Licensee currently limits all vehicles from travelling below the 4,494-foot contour elevation (high pool level) (Licensee 1997) except in designated areas. Designated areas include campgrounds, public and private boat ramps, parking areas, commercial resort operations with customary traffic patterns and launch facilities, and other areas specifically designated by the Licensee.

All land and water between the 4,500-foot and 4,494-foot contours, except those areas specifically restricted by the Licensee because of safety or operational concerns, are generally open to the public for recreational use. Private landowners and commercial entities may not place any signs, fencing, boulders, or other installations below this elevation line, which deter or impede public access. Docks, buoys, and other permitted structures are the personal property of the private landowner or commercial entity, and

public use of these facilities is determined and governed by the owner. The Licensee, in most areas, does not control public access on land above the 4,500-foot line, but does coordinate public access and uses with the Forest Service and others (Licensee 1997).

In this analysis, discussion of public access in the Project study area is divided into two main sections: a public access inventory, and a public access assessment for the overall area, followed by each area individually. The public access inventory includes public access opportunities and constraints for each of the four major Project areas (Lake Almanor, Butt Valley Reservoir, Seneca Reach, and Belden Reach). The public access assessment categorizes areas of high, moderate, and low public access opportunity for each of the four major Project areas. Additionally, future development and Project operations are discussed in terms of how changes in either could affect public shoreline access in the study area. Based on these analyses, proposed options or recommendations are made in Section E5.2.6.5.

E5.2.6.4.1 Public Access Inventory

For each of the four major Project study areas (Lake Almanor, Butt Valley Reservoir, Seneca Reach, and Belden Reach), an inventory of public shoreline access opportunities and constraints was developed. Figures E5.2.6-1 and E5.2.6-2 display public access "opportunities" and "constraints," respectively, at Lake Almanor. Figures E5.2.6-3 and E5.2.6-4 display public access opportunities and constraints, respectively, at Butt Valley Reservoir and the Project river reaches.

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E5.2.6.4.1.1 Lake Almanor

Located in the northern Sierra Nevada Mountains of California, Lake Almanor is 13 miles-long and up to 6 miles-wide and provides approximately 52 miles of shoreline (Knutsen 1997). At full pool elevation (4,494 feet mean sea level [msl]), the reservoir covers approximately 27,092 acres of surface water. Pool elevations in 1999 varied from 4,481.5 feet msl to 4,492.8 feet msl (Licensee datum) (Licensee 2000b). In 2001, surface water acres were 31 percent less than at the maximum high pool elevation (see Section E5.2.3—Reservoir Boating Study).

Public Access Opportunities at Lake Almanor

The first task of this analysis was to develop an inventory of public access opportunities in the study area. Public access opportunities include factors such as existing public recreation sites (Licensee and Forest Service), private recreation facilities allowing public use, trails, roads, Licensee land (excluding Project hydroelectric facilities), Forest Service public land, and areas with a slope of less 40 percent (high to moderate potential).

Existing Recreation Sites. Public recreation facilities on Lake Almanor are operated by the Licensee and the Forest Service (see Figure E5.2.6-1). The 14 public recreation facilities listed below are open to the public and are located on Lake Almanor.

- Almanor Campground
- Almanor Group Reservation Camp
- Almanor Overflow Camping Area
- Camp Conery Group Camp
- Almanor Rest Area (Hwy. 89)
- Canyon Dam DUA
- Dyer View DUA
- Eastshore DUA

- Last Chance Campground/Group Camp
- Lake Almanor Campground
- Almanor Beach
- Almanor Scenic Overlook
- Almanor Boat Launch
- Canyon Dam Boat Launch/DUA

Private recreation facilities also play an important role in providing recreational opportunities at Lake Almanor and satisfy a large portion of the recreation demand in the Project area (see Figure E5.2.6-1). Many of the private recreation facilities on Lake Almanor are also open to the general public, although a fee must be paid for use of the facilities (boat launches as resorts), and the rules at each private resort may vary. A complete inventory of facilities at private resorts is detailed in Section E5.1.2.

Twenty-four private recreation facilities (listed below) are located on Lake Almanor, 14 of which provide boat launches.

- Almanor Lakefront Village
- Almanor Lakeside Resort
- Almanor Lakeside Villas
- Big Cove Resort
- Carson's Cabins
- Cashman's Paul Bunyan Resort
- Country Club Resorts
- Dorado Inn
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Miller's Resort
- Moonspinner's Resort
- North Shore Campground
- Novotny's
- Plumas Pines Resort

- High Sierra Resort
- Knotty Pine Resort
- Lake Cove Resort
- Vagabond Resort
- Villager Resort
- Wilson's Camp Prattville

These 24 privately-owned and -operated commercial recreation facilities are located mostly on privately-owned land adjacent to Licensee-owned land. All private resorts have written agreements in place for utilizing Project lands adjacent to private lands, such as at North Shore Campground. All resorts operating on the Licensee's lands are under licensing agreements (Licensee 1997).

Private recreation facilities listed above generally fall into one of two categories based on their levels of public use: open to the public and closed to the public. The latter category includes private residential facilities where visitors stay for extended periods of time (the entire recreations season). The private facilities that fit into this category are Almanor Lakefront Village; Almanor Lakeside Resort; Almanor Lakeside Villas; Carson's Cabins; Country Club Resorts; and Villager Resort. The remaining 18 private facilities operate as commercial resorts where visitors pay a daily or weekly rate for use.

Private recreation facilities at Lake Almanor are generally more densely developed than Licensee and Forest Service facilities. In addition to facilities and services commonly offered at Licensee and Forest Service recreation sites (e.g., tent campsites, boat launches), private recreation providers also offer such amenities as RV hookup campsites, rental cabins, condominium rentals, and boat moorage.

Due to the more developed nature of private recreation facilities, user fees at these facilities are generally slightly higher than at public recreation facilities.

While there currently are many public recreation sites at Lake Almanor and roadways that circle the reservoir, distribution of these sites is uneven. Almost all existing recreation sites are located on or adjacent to the southwestern shoreline of Lake Almanor. This distribution can be a constraint to some visitors, especially local residents (particularly those living in Chester) who would like to use these sites, but may not have the transportation necessary to access them.

The Forest Service operates the Almanor and Canyon Dam Boat Launches, the only public (no fee) boat launches on the reservoir. Each launch has a concrete boat ramp, parking, and a wooden courtesy dock. Access to Almanor Boat Launch is seasonal while access to Canyon Dam Boat Launch/DUA is year-round.

Private recreation providers supply the majority of boating facilities at Lake Almanor. There are approximately 14 private boat launches (compared to two public boat launches) and over 20 private marinas with a total of nearly 900 boat slips. The public can easily use some of these facilities for fees, while use of others require membership or ownership. For example, the private boat launch at North Shore Campground may be used by the local Chester community for a fee.

Additionally, there are at least 24 dispersed undeveloped recreation sites on the reservoir plus additional sites in the Southwest Shoreline Access Zone (see Figure E5.1-2—Dispersed Recreation Sites in the UNFFR Project Vicinity). The majority of these sites are located on the northern end of the reservoir, with sites clustered in two main groups: along SR 89 just south of the town of Chester, and along the road to Last Chance Campground/Group Camp. Many of these sites are located where spur roads end at or near the reservoir shoreline. These roads are gated and vehicle access is limited. However, 14 of the 24 dispersed sites provide vehicle access to the shoreline of Lake Almanor. Other dispersed sites are accessed primarily by water. A fence along SR 89 restricts vehicle access to dispersed sites and the reservoir, although there are several pedestrian access points along the fence.

In addition to the 24 identified dispersed undeveloped recreation sites, the Southwest Shoreline Access Zone of Lake Almanor from south of Prattville to the Lake Almanor Campground is a popular undeveloped use area. Visitors use various access points in this area for vehicular access to the shoreline. On certain occasions, such as Independence Day, this area is very intensively used. Day use activities account for most of the use along this shoreline area. Approximately eight access sites/routes were identified in this area, some of which might be formalized with parking areas at the shoreline, signs and barricades restricting vehicular access below the 4,494-ft elevation. Some of these access sites have been barricaded.

Existing Trails. The LART is the only significant developed trail at Lake Almanor. This non-motorized trail is paved, 10 feet-wide, 9.5 miles-long, and winds through wooded areas and several lakeshore recreation areas along the southwestern shoreline.

Several developed trailheads provide access to LART. The northernmost access to the trail is located just off SR 89 on a small dirt road opposite Humbug/Humboldt Road. There is also a trailhead at the Almanor Boat Launch parking area and at four other parking areas between the community of Prattville and SR 89.

Several smaller, user-defined trails provide pedestrian access to the reservoir, especially in the areas around Lake Almanor with steep terrain, such as along the eastern shoreline. Additionally, all public and private recreation sites have some trail access to the shoreline, whether developed or primitive.

Existing Roads. Lake Almanor is ringed by several two-lane state highways, making vehicle access to the area relatively good from all directions. The principal route on the north end of the reservoir is SR 36 from east to west. SR 89 travels along the west shoreline and SR 147 travels along the southeast shoreline (see Figure E5.2.6-1).

The Lassen Scenic Byway encircles Lake Almanor along these existing highways. Its main objective is to preserve the aesthetic viewshed along these routes and to promote recreation and tourism in the area by linking a number of recreation resources. In

addition to encircling Lake Almanor, the byway connects various recreation sites in Lassen National Park and Lassen National Forest.

Smaller paved and unpaved spur roads around the reservoir provide vehicular access to or near the shoreline and land areas exposed during low pool elevations. Some of these spur roads are gated, limiting public access. The largest area of public vehicular access to the shoreline is between Prattville and Rocky Point. Several dirt access roads in this area provide vehicular access to the shoreline. This is a particularly popular area during summer months and the Independence Day holiday. Two other frequently utilized vehicular access areas, the narrow area between SR 89 and Lake Almanor (along the northwestern shoreline) and the Catfish Beach area, have recently been fenced to prohibit vehicular access that was disturbing sensitive resources in these areas.

Licensee-Owned Land. Within the Project boundary, the Licensee owns approximately 96 percent of the land and water surface area. The remaining 4 percent of the land is generally managed by the federal government, primarily the Forest Service. The Licensee property line for most of the reservoir follows the 4,500-foot contour elevation line (Licensee 2000b). Land below the 4,494-foot high pool level elevation line is Licensee property and is generally open to the public for non-vehicular recreation (Licensee 1997).

Land ownership above this contour line varies. The Licensee owns large portions of land adjacent to the 4,500-foot line (Licensee 2000b), especially at the northwestern and southeastern areas of Lake Almanor.

Public Land. Large portions of land adjacent to the 4,500-foot contour elevation line on the western and southern shores of Lake Almanor are managed by the Forest Service (see Figure E5.2.6-1).

These lands are part of the Lassen and Plumas National Forests and are generally open to the public for recreation. Overnight camping, however, is restricted to designated sites.

Slope. Most shoreline areas of Lake Almanor have slopes of less than 20 percent. Smaller areas of slopes between 20 and 40 percent are located on the western shoreline of the peninsula region and the eastern shoreline of the reservoir. Slopes between 20 and 40 percent represent a moderate constraint on public access and should not be excluded from potential areas for new public access sites.

Public Access Constraints at Lake Almanor

Project Hydroelectric Facilities. There are two Project hydroelectric facilities on Lake Almanor (see Figure E5.2.6-3). The primary facility is Canyon Dam and its associated spillway, located at the southernmost area of Lake Almanor. The second hydroelectric facility on Lake Almanor is a gated maintenance yard and the intake area of the Butt Valley Tunnel on the southwestern shoreline. Additionally, while not part of the Project,

the Hamilton Branch Powerhouse, located on Hamilton Reach (northeastern shoreline of Lake Almanor), is considered a hydroelectric facility for public access assessment purposes. Public access around Project hydroelectric facilities is restricted for safety purposes by gated roads, fences, and buoys/floating booms.

Non-Licensee Private Land. There are several small communities and residential areas along the shoreline of Lake Almanor, including several private shoreline residential developments and country/community clubs (see Figure E5.2.6-2).

Most non-Licensee private land is concentrated in the peninsula area, and the northeastern/eastern and the western/southwestern shoreline areas of Lake Almanor. Use of these areas is restricted to homeowners or members (private country clubs).

At Lake Almanor, there are approximately 980 residential lots adjacent to Project lands. Most of these lots are developed, with the biggest concentration of homes at Lake Almanor West Community Club (west shore of Lake Almanor), Lake Almanor Country Club (peninsula of Lake Almanor), Big Springs (northeast portion of Lake Almanor), Hamilton Branch (northeastern portion of Lake Almanor), and Eastshore (along east shore of Lake Almanor). These shoreline areas are developed, with many private docks and very few or no opportunities for public access. Several of these residential developments, though, provide very nice shoreline facilities for residential members who represent a significant portion of the local public.

Biological Constraints. The habitat range of sensitive plants and the territorial range of sensitive wildlife around Lake Almanor are displayed in Figure E5.2.6-2. Several sensitive plant and animal species in the area may pose temporal and/or spatial constraints on public access. The habitat for most of these species is found on the western and southern shorelines of the reservoir. On the western and southern shoreline, sensitive plant species include cream-flowered bladderwort, Sukdorf's milk-vetch, American scheucheria, English sundew, and slender Orcutt grass.

The slender Orcutt grass habitat is located to the west of the Almanor Group Campground and poses a serious constraint, as this plant is listed by California as endangered and by the federal government as threatened (California Department of Fish and Game (DFG) 2001). In general though, the presence of sensitive plant habitat does not preclude the construction of new public access facilities. However, an assessment would be necessary before construction to determine if the habitat actually occurs at the site and if mitigation is required.

Bald eagle, osprey, and northern goshawk nests are also located around the shoreline of Lake Almanor, especially on the southwestern and northwestern sides. Specifically, there are five bald eagle nests on the southwestern shoreline and one on the eastern shoreline. There are also nine osprey nests adjacent to the southwestern shoreline. In general, bald eagle nests tend to be more of a constraint on public access than other types of nests. However, the presence of either the bald eagle nests or other types of nests does not necessarily preclude public access, rather, it places some temporal and spatial constraints

on public access. Sierra Nevada red fox are found on the western shoreline of the reservoir, south of Chester. The proximity of these sensitive nest sites must be considered prior to developing recreation sites or encouraging additional or continual access near these sites.

Water Depth and Restricted Areas. Pool level fluctuations and drawdowns are a normal occurrence on hydropower reservoirs and may cause temporal and spatial limitations to public access. The pool level in 2001 was comparatively low due to drought conditions.

Low pool level depths can make certain areas of the reservoir inaccessible. Water depth is particularly a problem in the northwestern portion of Lake Almanor where shallow water restricts boat access (see Figure E5.2.6-2). It is also a problem at the far northern reach of the reservoir, to the north of the causeway, where there is often little or no water depth. Low water level conditions typically occur after the primary recreation season during normal water years or during drought years.

Additionally, water areas surrounding Project hydroelectric facilities are often restricted from public use due to safety and operations concerns. On Lake Almanor, two areas of water are restricted near Project hydroelectric facilities. The first area is adjacent to the Butt Valley Tunnel intake on the southwestern shore of the reservoir. The second area is adjacent to Canyon Dam and the spillway.

Slope. There are very few shoreline areas on Lake Almanor with slopes greater than 40 percent. The only significantly constrained shoreline area is on the western side of the peninsula. Other smaller inland areas with slopes greater than 40 percent are located in various areas around Lake Almanor, but none are likely to have a significant impact on public access.

E5.2.6.4.1.2 Butt Valley Reservoir

Located approximately 4 miles south of Lake Almanor, Butt Valley Reservoir is a long, narrow water body of moderate depth. At maximum pool elevation (4,142 feet msl), the reservoir covers 1,600 surface water acres (Licensee 2000b).

Public Access Opportunities at Butt Valley Reservoir

Existing Recreation Sites. There are three existing recreation sites on Butt Valley Reservoir. Cool Springs Campground (30 campsites) and Ponderosa Flat Campground (81 campsites) provide overnight camping opportunities. Three picnic sites and one, one-lane boat launch are available at the Alder Creek DUA/Boat Launch. These sites are presented in Figure E5.2.6-3—Public Access Opportunities—Butt Valley Reservoir and River Reaches.

The Licensee operates Alder Creek DUA/Boat Launch, the only developed boat launch on Butt Valley Reservoir, when road access is possible due to snow cover. It has a single lane concrete ramp. Access to the water from the launch is only available during the recreation season. The launch is not available year-round due to pool levels, accumulated

snow, and County Road (CR) maintenance (snow plowing). Fishing from boats accounts for most recreational boating on Butt Valley Reservoir. Many submerged stumps make boating on this reservoir challenging for large powerboats, PWC, and sailboats. Accordingly, Plumas County has directed a boat speed limit on the reservoir and restricted water-skiing and PWC use by county ordinance.

Additionally, there are several dispersed undeveloped recreation sites on Butt Valley Reservoir. These sites are used primarily for fishing access to the reservoir. They are located at the northern end of the reservoir, with sites clustered near the reservoir inlet and Butt Valley Powerhouse where fishing is known to be good. Each of these sites provides a parking area; however, there is no vehicle access to the shoreline. The shoreline is accessed by user-defined trails from parking areas to the water.

Existing Trails. There are no formal designated trails at Butt Valley Reservoir. Several user-defined primitive trails provide pedestrian access to the shoreline, mostly on the eastern side of the reservoir, originating at recreation sites and/or near the powerhouse.

Existing Roads. (See Figure E5.2.6-3.) The primary access road to Butt Valley Reservoir is CR 305 (Butt Valley Road), which runs along the eastern shoreline of the reservoir. Portions of this road are paved. This road provides access to the developed recreation sites and limited access, due to steep topography, for dispersed recreation at other shoreline areas on the reservoir. Licensee and Forest Service roads run along the

western shoreline. However, these roads are gated, limiting land-to-water public access opportunities along the western shoreline.

Licensee Land. (See Figure E5.2.6-3.) Licensee-owned property generally follows the 4,140-foot contour elevation line (Licensee 2000b). All land below this line is Licensee property and is generally open to the public for recreation.

Land ownership above the line varies, though the Forest Service manages most of the lands beyond the 4, 140-foot contour elevation line. The Licensee owns large portions of land adjacent to the contour line, especially at the northwestern and southeastern areas of Butt Valley Reservoir, as well as an area on the eastern shore surrounding Cool Springs Campground.

Public Land. (See Figure E5.2.6-3.) Most of the land adjacent to the 4,140-foot contour on Butt Valley Reservoir is managed by the Forest Service. This land is part of the Plumas National Forest and is generally open to the public for day use recreation activities.

Slope. Most shoreline areas of Butt Valley Reservoir have slopes of less than 20 percent, especially along the northern, eastern, and southern shorelines. The existing developed recreation sites on the reservoir are located in areas with slopes of less than 20 percent. Large areas of land with slopes of 20 to 40 percent are located along the eastern shoreline and smaller areas are located along the western shoreline.

Public Access Constraints at Butt Valley Reservoir

Project Hydroelectric Facilities. There are two project hydroelectric facilities on Butt Valley Reservoir: Butt Valley Powerhouse, located at the northernmost area of the reservoir; and Butt Valley Dam, located at the southernmost area of the reservoir (see Figure E5.2.6-4—Public Access Constraints—Butt Valley Reservoir and River Reaches).

Public access around Project hydroelectric facilities is restricted by gated roads, fences, and buoys/floating booms.

Non-Licensee Private Land. There are no privately-owned lands or private recreation facilities on Butt Valley Reservoir. However, there are smaller areas of non-Licensee private land adjacent to the study area (see Figure E5.2.6-4).

Biological Constraints. Quincy lupine habitat, as well as bald eagle and osprey nests, are found in various areas around the shoreline of Butt Valley Reservoir (see Figure E5.2.6-4). Specifically, there are three osprey nests on the western shoreline and one on the eastern shoreline. Additionally, there are two bald eagle nests on the western shoreline and one adjacent to the eastern shoreline. These biological resources may potentially pose temporal and/or spatial constraints to public access at Butt Valley Reservoir.

Water Depth and Restricted Areas. Aside from fluctuations and drawdowns in reservoir pool levels, there are no identified areas of Butt Valley Reservoir with persistent shallow water problems. However, public boating access is generally restricted due to stumps. A restricted area adjacent to the Butt Valley Dam is defined by a floating barrier.

Additionally, there is a small restricted area near the Butt Valley Powerhouse at the northern end of the reservoir.

Slope. Most of the western shoreline and inland portions of the eastern shoreline have slopes of greater than 40 percent.

E5.2.6.4.1.3 Seneca Reach

Seneca Reach consists of a 10.8-mile portion of the UNFFR extending from Canyon Dam to the Caribou Powerhouse 1. The northern end, near the Canyon Dam, and the southern end, near the Caribou Powerhouse 1 are officially within the FERC Project boundary; however, for purposes of this analysis, the study area was extended the full length of the reach.

Public Access Opportunities Along Seneca Reach

Existing Recreation Sites. There are no developed recreation facilities along Seneca Reach. However, there are a few dispersed undeveloped recreation sites. These sites provide public access to the river and can be reached by vehicle.

Access to the river at the first site (S-1 on Figure E5.2.6-3—Public Access Opportunities—Butt Valley Reservoir and River Reaches) near the abandoned Sweet Marie Woodward Mine, is limited by very steep topography and can only be reached with a 4-wheel drive vehicle, and the road providing access to the site is gated. The site is approximately 7.2 miles south of SR 89. The second site (S-2), near the bridge on

Seneca Road, provides easier access to the river and has a parking area. The site is approximately 5.5 miles from SR 89. Weather conditions and snowfall limit access.

Various other areas on the Seneca Reach are used for informal access to the water. Just below the Canyon Dam, steep, user-defined trails provide access to the reach on both sides of the river near the gauging station. This area is used by anglers and potentially could serve as a boater put-in. The area around Skinner Flat, to the south of the gauging station, also provides informal access to the water. A steep road is used for another access at the confluence of Butt Creek and the NFFR near the North Fork Fishing Trail. This road is gated so visitors must walk down to the river. Additionally, some visitors use the North Fork Fishing Trail to access the river. The majority of use at these informal access areas is from anglers.

Existing Trails. The North Fork Fishing Trail at Caribou Powerhouse 1 is located at the far southern end of Seneca Reach (see Figure E5.2.6-3). The trail begins at the Caribou Powerhouse 1 and extends up the NFFR for approximately 1.5 miles to Butt Creek. Smaller, user-defined primitive trails provide pedestrian access to the river from Seneca Road at various points along the reach.

Existing Roads. (See Figure E5.2.6-3.) Seneca Road provides road access along Seneca Reach. Portions of this road are paved. This road follows the eastern shoreline and a small portion of the northern shoreline. However, access to the reach from the road is limited due to steep, rugged terrain. Access along Seneca Road is also limited during

winter months, as snow is not removed along a large portion of the road. Forest Service roads in the area are open to limited traffic (administrative use, permitted use, and/or specialized traffic) and provide some degree of access to the area, provided visitors have a vehicle suitable for Forest Service road conditions.

Licensee Land. The Licensee owns only small portions of land at the northern (near Canyon Dam) and southern (near Caribou Powerhouses 1 and 2) end of Seneca Reach (see Figure E5.2.6-3). The majority of land adjacent to the reach is Forest Service-managed land with a few irregularly shaped parcels of private land located primarily along the center of the reach.

Public Land. (See Figure E5.2.6-3.) Most of the land adjacent to Seneca Reach is part of Plumas National Forest, which is managed by the Forest Service. This land is generally open to the public for day use recreation activities.

Slope. Very few areas on Seneca Reach have slopes of less than 40 percent. There are small areas, especially at the northern and middle sections of the reach, where the slope is less than 40 percent (see Figure E5.2.6-3).

Public Access Constraints Along Seneca Reach

Project Hydroelectric Facilities. Seneca Reach begins below Canyon Dam and ends at the Caribou Powerhouse 1 (see Figure E5.2.6-4—Public Access Constraints—Butt

Valley Reservoir and River Reaches). Public access around these Project hydroelectric facilities is restricted by gated roads, fences, and buoys/floating booms.

Non-Licensee Private Land. Some of Seneca Reach is private property, especially on the lower section (see Figure E5.2.6-4). Several mining operations exist along Seneca Reach, which restrict or discourage public access to the river corridor.

Biological Constraints. There are very few biological constraints on Seneca Reach that affect public access. The only area with a possible biological constraint is the southernmost section (just above Caribou Powerhouse 1), which is habitat for the California red-legged frog (see Figure E5.2.6-4).

Water Depth and Restricted Areas. Due to the nature of the reach, water levels fluctuate depending on natural tributary flows. Public access is restricted in areas adjacent to Project hydroelectric facilities located along Seneca Reach (see Figure E5.2.6-4).

Slope. The land along Seneca Reach is very steep and rugged. Most of the shoreline areas along the reach have slopes of greater than 40 percent (see Figure E5.2.6-4).

E5.2.6.4.1.4 Belden Reach

Belden Reach is a 9.3-mile portion of the NFFR extending from Caribou Powerhouses 1 and 2 to the confluence of the NFFR and Yellow Creek along SR 70 at Belden

Powerhouse and Belden Rest Stop (SR 70). In general, public access is much better on along Belden Reach than Seneca Reach.

Public Access Opportunities Along Belden Reach

Existing Recreation Sites. There are five developed public recreation facilities along Belden Reach (see Figure E5.2.6-3—Public Access Opportunities—Butt Valley Reservoir and River Reaches). The Forest Service operates three campgrounds along the reach: Gansner Bar Campground (14 campsites), North Fork Campground (20 campsites), and Queen Lily Campground (12 campsites). The Licensee operates and maintains Belden Rest Stop, on SR 70 adjacent to Belden Powerhouse. There is also a small gravel parking area off of Caribou Road that provides shoreline access to the Belden Forebay and parking for the North Fork Fishing Trail.

In addition, there is one private campground with a store along Belden Reach. Caribou Corners is located adjacent to the junction of Caribou Road and SR 70.

There are at least 20 dispersed undeveloped recreation sites along Belden Reach (see Figure E5.2.6-3). Most of these sites can be accessed by vehicle off of Caribou Road. Those sites not accessed directly from Caribou Road can be accessed by smaller Licensee and Forest Service roads.

Access to the river from dispersed sites along Belden Reach varies. Some sites are situated directly on the river and provide easy access to the water. Others are located

away from the river. Of the latter sites, some have no river access while others have informal, user-defined trails with access to the water.

Existing Trails. There are no formal developed recreation trails along Belden Reach. However, there are several user-defined pedestrian access trails to the shoreline at various recreation sites along Belden Reach.

The Pacific Crest National Scenic Trail (PCT) runs through Belden Rest Stop at the far western edge of the Project area. The PCT runs generally in a north–south direction, crossing SR 36 approximately 6 miles west of Lake Almanor and SR 70, south of the Project area at Belden. While most of the trail is not within the Project area, it does run through one of the developed recreation sites in the Project area—Belden Rest Stop along SR 70. This facility serves primarily as a roadside rest stop, but also serves as an informal trailhead for the PCT. The Licensee does not maintain any portion of the trail or any associated recreational elements, such as signs.

Belden Rest Stop serves as an informal trailhead for two additional trails: Yellow Creek Trail and Indian Springs Trail. Yellow Creek Trail is approximately 1.4 miles-long; Indian Springs Trail approximately 6.5 miles. Similar to the PCT, the Licensee does not maintain any portion of either trail or any associated elements.

Existing Roads. (See Figure E5.2.6-3.) Caribou Road and SR 70 provide road access to Belden Reach. Caribou Road begins at the upper end at Caribou Powerhouses and

follows the western shoreline and a smaller portion of the eastern shoreline of Belden Reach until it reaches SR 70. Portions of this road are paved. Access to the river off of Caribou Road is variable with several pullouts. SR 70 travels along the northern shoreline of the Feather River and is a major cross-mountain highway. It is at the southernmost section of Belden Reach. Additionally, some smaller Licensee and Forest Service roads in the area are open to limited traffic (administrative use, permitted use, and/or specialized traffic), while others are open to general public traffic. These roads provide varying degrees of access to the area.

Licensee Land. The Licensee owns several areas along Belden Reach. The largest concentration of Licensee-owned land is on the lower section of the reach. Smaller Licensee-owned lands are located at the upper (near dispersed site B-18 on Figure E5.2.6-3) and middle (between dispersed sites B-13 and B-14 on Figure E5.2.6-4) sections of the reach.

Public Land. (See Figure E5.2.6-3.) Most of the land adjacent to Belden Reach is part of the Plumas National Forest. This land is generally open to the public for day use recreational activities.

Slope. Only small areas of shoreline along Belden Reach have slopes of less than 40 percent (see Figure E5.2.6-3). Most areas where the slope is less than 40 percent coincide with the location of existing recreation facilities and undeveloped sites.

Public Access Constraints Along Belden Reach

Project Hydroelectric Facilities. There are five Project hydroelectric facilities along Belden Reach (see Figure E5.2.6-4—Public Access Constraints—Butt Valley Reservoir and River Reaches). Caribou Powerhouse 2 is located above Belden Forebay. Combined with flows from Caribou Powerhouse 1, water then flows into Belden Forebay. Belden Forebay Dam and Oak Flat Powerhouse are located at the southern end of Belden Forebay. The fifth Project hydroelectric facility is Belden Powerhouse, at the southern end of Belden Reach near SR 70. Public access around Project hydroelectric facilities is restricted by gated roads, fences, and buoys/floating booms. Other Project penstocks and pipelines connect these facilities.

Non-Licensee Private Land. There are some small areas of private property located on the lower section of Belden Reach (just above and below the intersection of Caribou Road and SR 70). Public access in these areas is discouraged and/or gated. (See Figure E5.2.6-4.)

Biological Constraints. There are a number of biological constraints along Belden Reach (see Figure E5.2.6-4).

The entire area has been designated by the United States Fish and Wildlife Service as a critical habitat for the California red-legged frog. Additionally, there are areas, especially along the middle and lower sections, where sensitive vegetation habitats, including Feather River stonecrop, Quincy lupine, Stebbin's monardella, and Cantelow's lewisia, are present.

Water Depth and Restricted Areas. Due to the nature of Belden Reach, water levels fluctuate depending on natural flows and upstream releases. Additionally, public access is restricted in areas adjacent to Project hydroelectric facilities located on the reach (see Figure E5.2.6-4).

Slope. The slope along most of the reach's shoreline is greater than 40 percent, which limits public access (see Figure E5.2.6-4). However, several small access sites are available along the Caribou Road corridor.

E5.2.6.4.2 Public Access Assessment for the Project Area

Public access at each of the four Project areas (i.e., Lake Almanor, Butt Valley Reservoir, and Seneca and Belden Reaches) was assessed using GIS technology to overlay and prioritize (high to low) important opportunity and constraint factors identified in Section E5.2.6.3 and presented in Table E5.2.6-1. Public access composite conditions maps were developed (see following pages) for major Project areas. Additionally, water-based shoreline access maps for Lake Almanor and Butt Valley Reservoir were developed.

This GIS-based analysis is a planning tool intended to identify the existing range of public access and potential sites for future public access development, if needed. Because of the large pixel size and scale of some of the GIS data layers, this analysis is not appropriate for data for siting small-scale or linear developments, such as trails.

Maps depicting the various levels of public access were created by overlaying opportunity and constraint data layers. A composite of higher-ranked public access data layers and lower-ranked constraint data layers depicts areas that are most suitable for existing and potential public access development. On the composite figures, areas of high public access are displayed in green, areas of moderate public access are displayed in yellow, and areas of low public access are displayed in pink and red. Conclusions regarding overall public access can be also drawn by reviewing these overlay maps. The opportunity and constraint maps represent the "building blocks" of the analysis provided in this section. Section E5.2.7—Recreation Suitability Analysis builds on the results of this section and identifies potential areas for new recreation developments such as campgrounds or DUAs, if needed.

Areas of low public access contain non-Licensee private land, sensitive plant and wildlife species habitat (nest locations), and/or slopes of greater than 40 percent. Because these three conditions are not differentiated separately on the composite conditions maps, areas labeled as low public access should not automatically be eliminated as potential areas of public access. On-site reconnaissance is needed to determine which constraint conditions exist in each area before a final judgement is made.

Due to the combination of various public access constraints into one composite category, areas categorized as high public access must have a slope of less than 20 percent and be Licensee-owned or public land. Areas of moderate public access must have a slope of less than 40 percent and also be Licensee-owned or public land.

E5.2.6.4.2.1 Lake Almanor Public Access Assessment

Overall public access at Lake Almanor is presented for overall land-based and water-based public access and then in four sections according to geographic area (Chester/North Shore, Peninsula, Eastshore, and West/South Shore). Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Overall Lake Almanor Land-Based Shoreline Access

Areas of overall high public access include:

- The western and northern shorelines, north of the causeway on SR 36;
- The western shoreline near the town of Chester;
- The shoreline between SR 89 and the reservoir; and
- Various sections of shoreline along the western/southern shorelines.

Despite being categorized as having high public access via land, the western and northern shorelines of Lake Almanor do not provide a high level of public access via water. Shallow water levels (or no water during lower pool elevations) makes accessing the water from these shorelines nearly impossible (as described below).

Areas of overall moderate public access include:

- Small sections of land on and adjacent to the eastern/southeastern shorelines; and

- Small sections of land at the far northern area of the reservoir (to the north of the causeway on SR 36).

In general, not many areas fall into the moderate public access category around Lake Almanor or in the larger Project area.

Areas of overall low public access include:

- Most of the northern shoreline including the peninsula area;
- A large portion of the eastern/northeastern shorelines;
- Small sections of the western shoreline; and
- Large areas of the southern shoreline.

The large area around Lake Almanor categorized as low public access indicates the presence of one or more constraints, including sensitive plant habitat, territorial range of a sensitive wildlife species, non-Licensee private land, or slopes of greater than 40 percent. Further on-site investigation is needed to determine the true extent of public access in these areas. For example, the presence of sensitive plant habitat would not necessarily preclude new public access facilities, but would require an initial assessment to determine whether the plant actually occurs at the site.

Additionally, while areas of private property are considered a constraint to public access and are thus included in the low access category, many of these lands still play an important role in meeting the recreational needs of residents in the Project area.

Overall Lake Almanor Water-Based Shoreline Access

Due to the large surface area of Lake Almanor, changes in pool level tend to be gradual. These changes can still affect public access, from both land and water. The maximum high pool elevation for Lake Almanor is 4,494 feet and the normal low is 4,469 feet (Licensee 2000b). The annual high pool level is typically reached in late May or early June. Reservoir pool levels then decrease gradually, usually reaching their lowest in December or January. Given the unpredictability of rain and snow amounts, the Licensee voluntarily attempts to maintain an operational water level of between 4,494 and 4,474 feet during the summer recreation season (Memorial Day to Labor Day) on Lake Almanor (Licensee 2000b).

Overall water-based shoreline access is displayed in Figure E5.2.6-5—Lake Almanor Water-Based Shoreline Access Composite Conditions. The Lake Almanor high pool elevation level was used as the normal shoreline for determining access from a boat.

Shoreline access via boat was identified based on areas where a large powerboat could be pulled up on shore (beachable shoreline) during high and/or low pool elevations. This identification was made in the field through on-site observations.

The following four access categories were used for describing shoreline access via boat:

- Year-round Beachable Shoreline—boats can be pulled on shore during high and low reservoir elevations (there is a beach at low and high pool).

- Higher Water Beachable Shoreline—boats can only be pulled on shore during high reservoir elevations (there is no beach at low pool).
- Lower Water Beachable Shoreline—boats can only be pulled on shore during low reservoir elevations (there is no beach at high pool).
- Limited or No Shoreline Access—boats cannot be pulled on shore during high or low reservoir elevations or access is limited (no beach exists at any pool level).

The shoreline around Lake Almanor contains areas in all four shoreline accessibility categories (see Figure E5.2.6-5). Most of the southern, northeastern, and peninsula shoreline fall in the year-round beachable shoreline category. These areas exist where many of the public and private recreation facilities are located and account for nearly half (48 percent) of the total shoreline miles at Lake Almanor. Table E5.2.6-2 displays the miles and percentages of shoreline in each accessibility category.

Three shoreline areas on Lake Almanor are categorized as accessible by a large boat only during high reservoir elevations, and account for 14 percent of the shoreline. One of these areas is located on the western shoreline adjacent to the Lake Almanor West Golf Course.

The other two areas are located on the northern shoreline, one southeast of the causeway on SR 36 and the other around the area where Bailey Creek enters Lake Almanor.

Table E5.2.6-2
Miles and Percentage of Lake Almanor Shoreline per Shoreline Accessibility Category

Shoreline Accessibility Category[1]	Miles of Shoreline[2]	Percentage of Shoreline[2]
Year-round Beachable Shoreline	26.47	48
Higher Water Beachable Shoreline	7.70	14
Lower Water Beachable Shoreline	4.41	8
Limited or No Shoreline Access	16.58	30
Total	**55.16**	**100**

[1]Accessibility assumes a beachable shoreline by a large boat.

[2]Miles and percentage of shoreline computed based on high pool elevation shoreline.

Source: EDAW, Inc.

Both the northern shoreline (east of the peninsula) and a portion of the southeastern shoreline fall in the lower water beachable shoreline category. These areas account for only 8 percent of the total Lake Almanor shoreline (see Table E5.2.6-2). These areas are generally inaccessible by large boats during high reservoir elevations due to very shallow water depths near shore.

A good portion of the Lake Almanor shoreline falls within the limited or no shoreline access category, including the west shore north of Lake Almanor West residential development and shoreline areas north of the causeway on SR 36. These areas account for 30 percent of the shoreline (see Table E5.2.6-2). These shorelines fall within this category because large boat access is limited by water depth.

During low pool elevations, the exposed shoreline area extends significantly into the reservoir basin, limiting access. During high pool elevations, access to this area is limited due to extremely shallow water along the western shoreline. The northern

segment of Lake Almanor (the area north of the causeway) is often without water, severely limiting shoreline access by boat. Additionally, the causeway essentially blocks all boat access to the northern segment from the main water surface area of Lake Almanor.

Figure E5.2.6-5 displays zones on Lake Almanor where boating is limited. The largest zones are on the north and northwestern side of the reservoir where water is shallow. The zones around Goose Island and the Dakasu Islands also provide limited boating opportunities during low reservoir levels due to shallow water and exposed rocks and stumps. Stumps and shallow water around the tip of the peninsula also limit boating. The only other zones of limited boating access are around the Project intake facilities on Lake Almanor.

Chester/North Shore Area Summary

Overall public access at the Chester/North Shore segment of Lake Almanor is presented in Figures E5.2.6-6 and E5.2.6-7—Chester/North Shore Public Access Composite Conditions (Almanor NW and Almanor west, respectively). Categories of public access that were developed from the public access opportunities and constraints analysis (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of overall high public access include:

- The western and northern shorelines of the reservoir, north of the causeway on SR 36; and
- The western shoreline near the town of Chester.

While the public can easily access shoreline in these areas, once at the shoreline, water access is limited. A large, limited boating access zone occurs adjacent to the shorelines in this section of Lake Almanor, and boat access to the northern segment (north of the causeway) is blocked by SR 36. Shallow water during high pool elevations and no water during low pool elevations make accessing the water very difficult from these shorelines.

Areas of overall moderate public access include:

- Small sections of land at the far northern area of the reservoir (to the north of the causeway on SR 36).

Areas of overall low public access include:

- Most of the eastern, and smaller portions of the western shoreline in the far northern section of the reservoir (north of the causeway on SR 36); and
- Portions of land on the western shoreline around and south of the town of Chester.

Peninsula Area Summary

Overall public access at the Peninsula segment of Lake Almanor is presented in Figure E5.2.6-8—Peninsula Public Access Composite Conditions. Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of overall high public access include:

- The eastern shoreline of the tip of the peninsula (this area is small, narrow, and surrounded by private land, limiting its use as a public access site).

Areas of overall moderate public access include:

- A narrow strip of land along the northeastern shoreline of the peninsula where many private resorts are located (Big Cove Commercial Zone).

Areas of overall low public access include:

- Almost the entire Peninsula segment of Lake Almanor falls within the low public access category.

Almost all peninsula land is privately-owned and closed to the general public. However, while private ownership is a constraint for purposes of this analysis, several private resorts clustered in the eastern portion (Big Cove area) of the peninsula do provide private commercial public access opportunities. A future marina expansion project is also being considered in this area.

These opportunities play a very important role in the overall mix of recreational opportunities in the Project area. Other private recreation facilities and private residential facilities on the peninsula are generally closed to public access and require membership and/or longer-term lease agreements for use.

Eastshore Area Summary

Overall public access at the Eastshore segment of Lake Almanor is presented in Figure E5.2.6-9 and E5.2.6-10—Eastshore Public Access Composite Conditions (Almanor NE and Almanor SE, respectively). Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of overall high public access include:

- Sections on the southern portion of the eastern shoreline of Lake Almanor, especially between SR 147 and the shoreline.

Some of these areas coincide with current recreation facilities. However, none of the existing recreation facilities in this area provide easy access to the water. Instead, these sites are primarily used as day use facilities only, providing opportunities for land-based activities such as picnicking and resting/relaxing. Some steep, user-defined trails from the facilities do provide limited shoreline access.

Areas of overall moderate public access include:

- Small sections on the southern portion of the eastern shoreline of Lake Almanor, especially between SR 147 and the shoreline.

Areas of overall low public access include:

- Most of the eastern shoreline of Lake Almanor.

Large acres of private land exist along this shoreline. The private portions of the eastern shoreline do provide some commercial public access opportunities at resort locations. While these opportunities play a very important role in the overall mix of recreational opportunities in the Project area, they do not provide the same level of public access as Licensee and Forest Service sites. This is because of user restrictions such as memberships, fees, ease of access, and owner regulations.

West/South Shore Area Summary

Overall public access at the West/South Shore segment of Lake Almanor is presented in Figure E5.2.6-11—West/South Shore Public Access Composite Conditions and Figure E5.2.6.10 Lake Almanor Eastshore Public Access Composite Conditions.

Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of overall high public access include:

- The shoreline between SR 89 and the reservoir;
- Portions of shoreline around and to the north of Almanor Boat Launch and Almanor Beach; and
- Large sections of the far southern shoreline from approximately Dyer View DUA south to Canyon Dam.

The West/South Shore segment of Lake Almanor has the best areas of high public access. These areas have the right combination of limited slope, public land, road access, and water depth, making them ideal for providing public access opportunities and accounting for much of the uneven distribution of recreation facilities on the reservoir. Most existing public recreation facilities are located in this section of the reservoir. Both public boat launches, Almanor Boat Launch and Canyon Dam Boat Launch/DUA, as well as various day use and campground facilities provide access to the reservoir.

Areas of overall moderate public access include:

- Small sections of land adjacent to the West/South Shore segment of Lake Almanor, located on the southern half of the shoreline, adjacent to areas of high public access.

Areas of overall low public access include:

- Land south of SR 89;
- Areas north and south of Almanor Boat Launch and Almanor Beach; and
- Smaller sections along the southern half of the shoreline.

Private land ownership and sensitive plant and animal habitat are the primary constraints in this segment of Lake Almanor. Sensitive plant habitat, while causing areas to be categorized as low public access, may not necessarily impede public access. On-site surveys are necessary to determine and document the absence or presence of species. The same is true for possible ranges of sensitive wildlife species, specifically raptor species. Further investigation is needed before additional public access opportunities are recommended and/or developed here.

E5.2.6.4.2.2 Butt Valley Reservoir Public Access Assessment

Overall public access at Butt Valley Reservoir is presented for overall land-based and water-based public access in Figure E5.2.6-12—Butt Valley Reservoir Public Access Composite Conditions. Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Overall Butt Valley Reservoir Land-based Shoreline Access

Areas of overall high public access include:

- Small sections of shoreline along the eastern and western side of the reservoir.

The eastern shoreline at the northern end of the reservoir does provide public access to the reservoir. Ponderosa Flat Campground and three dispersed sites are located here. The remaining two developed recreation sites (Cool Springs Campground and Alder

Creek DUA/Boat Launch) are also located in areas of high public access along the eastern shoreline of Butt Valley Reservoir.

Areas of overall moderate public access include:

- Large areas of shoreline at the southern end of the reservoir; and
- Parcels of land along the western and eastern shorelines.

While there are many areas of moderate public access to the shoreline at the southern end of the reservoir, a floating boom restricts boat access. User-defined trails do provide limited access to the water for bank angling. However, the limited boating access zone restricts access opportunities at this end of Butt Valley Reservoir.

Areas of overall low public access include:

- Almost the entire western shoreline, excluding the far north and south.

Slope is the major constraint around Butt Valley Reservoir. High, steep banks make accessing the water from most areas along the western and eastern shorelines difficult. Additionally, a limited boating access zone restricts boat traffic at the southern end of the reservoir.

Overall Butt Valley Reservoir Water-Based Shoreline Access

Typically, Butt Valley Reservoir fluctuates about 1 foot on a daily basis and 5 feet on a weekly basis depending on power system operating needs. The water level of Butt

Valley Reservoir can range from a maximum pool elevation of 4,132 feet to a minimum of 4,115 feet, though the summer minimum usually falls to approximately 4,120 feet (Licensee 2001b).

Water-based shoreline access is depicted in Figure E5.2.6-13—Butt Valley Reservoir Water-Based Shoreline Access Composite Conditions. Shoreline access was determined based on areas where a boat could be pulled up on shore (beachable shoreline) during high and/or low pool elevations.

The following four access categories were used for describing shoreline access via boat:

- Year-round Beachable Shoreline—boats can be pulled on shore during high and low reservoir elevations (there is a beach at low and high pool).
- Higher Water Beachable Shoreline—boats can only be pulled on shore during high reservoir elevations (there is no beach at low pool).
- Lower Water Beachable Shoreline—boats can only be pulled on shore during low reservoir elevations (there is no beach at high pool).
- Limited or No Shoreline Access—boats cannot be pulled on shore during high or low reservoir elevations or access is limited (no beach exists at any pool level).

The shoreline of Butt Valley Reservoir contains areas that meet three of the shoreline accessibility category criteria. Miles and percentages of shoreline by accessibility category are displayed in Table E5.2.6-3. A few areas on the western and eastern

shorelines are considered year-round beachable shoreline and account for 35 percent of the shoreline. On the eastern side of the reservoir, beachable areas coincide with two existing recreation sites (Cool Springs Campground and Alder Creek DUA/Boat Launch). A section of the northern shoreline falls into the higher water beachable shoreline category, making it inaccessible during low pools. This area accounts for approximately 10 percent of the reservoir shoreline. Finally, a large portion of land on both the western and eastern shorelines is in the limited or no shoreline access category, primarily due to its steep shore topography. These areas account for more than half (55 percent) of the shoreline miles of Butt Valley Reservoir.

Table E5.2.6-3
Miles and Percentages of Butt Valley Reservoir Shoreline per Shoreline Accessibility Category

Shoreline Accessibility Category[1]	Miles of Shoreline[2]	Percentageof Shoreline[2]
Year-round Beachable	4.69	35
Higher Water Beachable	1.28	10
Lower Water Beachable	0	0
Limited or No Shoreline Access	7.29	55
Total	**13.26**	**100**

[1] *Accessibility assumes a beachable shoreline by a large boat.*

[2] *Miles and percentage of shoreline computed based on high pool elevation shoreline.*

Source: EDAW, Inc.

Figure E5.2.6-13 also displays zones of limited boating access. These are located adjacent to Project hydroelectric facilities, in the northern most part of the reservoir below Butt Valley Powerhouse, and in the southern section near Butt Valley Dam.

E5.2.6.4.2.3 Seneca Reach Public Access Assessment

Overall public access at Seneca Reach is presented in Figure E5.2.6-14 and E5.2.6-15—Seneca Reach Public Access Composite Conditions (River-Upper and River-Middle North, respectively). Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of high public access include:

- Middle sections of the reach between the two dispersed sites; and
- A few small areas on the southern half of the reach.

Almost none of the lands along Seneca Reach fall into the high public access category. Areas that are categorized as high public access are generally located along the banks of the river due to flatter topography, but they lack road access. There are also a few other areas of high public access to the west and the east of the river at the northern end of Seneca Reach.

Areas of moderate public access include:

- Areas along the middle section of the reach, extending from south of dispersed site S-1 north to dispersed site S-2 (near Seneca Bridge).

There are only a few areas along Seneca Reach categorized as moderate public access; those that exist are to the west and east of the river, at the northern end of Seneca Reach.

Areas of low public access include:

- Almost the entire Seneca Reach falls within the lower public access category.

Slope is the main constraint along the reach causing the majority of land to be categorized as low public access. The steep, rugged canyon in which Seneca Reach flows is generally inaccessible except in the area approximately midway between dispersed sites.

E5.2.6.4.2.4 Belden Reach Public Access Assessment

Belden Forebay

Public access at the Belden Forebay segment of Belden Reach is presented in Figure E5.2.6-16—Belden Forebay Public Access Composite Conditions. Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of high public access include:

- Small areas that closely follow the bank of the river, and which contain dispersed recreation sites.

Areas of moderate public access include:

- Small areas that tend to closely border the river and areas of high public access, which contain some existing dispersed recreation sites.

Areas of low public access include:

- Most areas of Belden Forebay contain steep slopes, which cause them to be classified as low public access.

Belden Reach Below Belden Forebay

Public access at Belden Reach below Belden Forebay is presented in Figure E5.2.6-17—Belden Reach Below Belden Forebay Public Access Composite Conditions. Categories of public access that were developed from the public access opportunities and constraints analyses (see Table E5.2.6-1) are presented graphically using three scales: high (green), moderate (yellow), and low (pink/red).

Areas of high public access include:

- Small sections of land that closely follow the bank of the river and contain three developed recreation facilities (Gansner Bar Campground, North Fork Campground, and Queen Lily Campground), as well as many dispersed sites.

Areas of moderate public access include:

- Small areas that closely border the river and areas of high public access, and contain many existing dispersed recreation sites.

Areas of low public access include:

Most areas of Belden Reach below the Belden Forebay contain steep slopes which cause them to be classified as low public access.

E5.2.6.4.3 Future Private Development

Current and potential shoreline property sales were considered to determine possible development plans in the Project area and their potential affect on public access. No significant pending shoreline land sales were identified that could affect public access. The Draft Shoreline Management Plan, which is being developed by the Licensee as a separate plan, details current and potential land sales and developments in more detail.

There are three private development projects that may impact public access in the study area during the term of the new license. The Bailey Creek and Foxwood developments are located at the northern end of the Almanor Peninsula. These two developments represent two of three approved commercial and residential complexes on approximately 1,251 acres. There is currently discussion about expansion of the residential communities at these developments to add 2,177 new housing units. Additionally, the Bailey Creek development may potentially add a new public marina, at the mouth of Bailey Creek on Licensee-owned land; however, no plans have been submitted for formal public review. If this marina is developed, the facility would help meet public demand on the east shore for boat moorage and shoreline access.

Additionally, a new resort is also proposed in adjoining Lassen County on the north-facing slopes of Dyer Mountain near Westwood, CA. Dyer Mountain Four Season Mountain Resort will consist of up to 1,200 housing units, up to three 18-hole golf courses, and a ski area on Dyer Mountain. While the main resort is out of the Project area, some of its visitors and residents will likely use Lake Almanor. Additionally, there

has been discussion about potentially operating a new marina on Lake Almanor, but no plans have been formally submitted for public review. If developed, this new marina would also help meet demand for boat moorage and shoreline access.

All potential private residential development would occur on private land. Each of the new developments will create more demand for recreation facilities and water-oriented recreation opportunities on and around Lake Almanor. These developments and their potential effects are further discussed in Section E5.2.4-Projected Recreation Use Analysis.

E5.2.6.4.4 Project Operations

Project operations, including hydroelectric power generation and potential land sales or purchases by the Licensee, were considered to determine if changes would affect public access to the Project area. No significant changes in Project operations are anticipated during the term of the new license that would affect public access. Additionally, no major land purchases, or sales of Project lands, by the Licensee are anticipated during the term of the new license that would affect public access.

E5.2.6.5 Recommendations

E5.2.6.5.1 Public Access Assessment Summary

This section summarizes shoreline day use public access and presents potential actions which could be implemented to enhance public access in specific areas. In general, many shoreline day use public access opportunities exist in the Project area, and levels vary

depending on location. Several constraints, however, preclude shoreline day use public access to the shoreline in some areas due to steep topography, land ownership, sensitive resources, and lack of road access.

Most shoreline DUAs around Lake Almanor of the land categorized as high public access, and all but one developed Licensee and Forest Service recreation facilities, are located along the southwestern shoreline. The primary constraint on new shoreline day use public access sites around Lake Almanor is the large amount of privately-owned land. Private resorts play a very important role in helping provide for overall public recreational needs in the region and Project area. However, some private resort operations may be more restrictive, charge fees, and are typically more commercially-oriented and densely-developed compared to comparable public facilities.

Shoreline day use public access around Butt Valley Reservoir is generally confined to the eastern shoreline. Most lands categorized as high public access are on the eastern shoreline, and existing recreation facilities are already located on these lands. The steep slopes around most of Butt Valley Reservoir limit new public access opportunities.

Most developed shoreline day use public access sites along Seneca and Belden Reaches are located on the southern half of Belden Reach. Most dispersed recreation sites, many of which provide access to the river, are also located along Belden Reach. Existing public access sites tend to be located in the high and moderate public access areas of the

river reaches. Very few possibilities for new public access opportunities exist along the river reaches, as steep slopes severely limit new access development.

E5.2.6.5.2 Potential Options to Enhance Public Access

Several actions are currently underway to enhance shoreline day use public access. Other new sites are also being proposed by the Licensee. Other recreation relicensing studies are also addressing this issue for developed campgrounds and day use sites, including the Recreation Suitability Analysis (see Section E5.2.7), which utilized the results of this study to help identify areas for potential new recreation facilities to help meet future demand. Additionally, Section E5.1.4—ADA Accessibility Study, discusses ways to enhance accessibility for the physically disabled in the Project area.

Currently, the Forest Service is planning several site improvements in the Project area to enhance public access. These actions are discussed below. In addition, the Licensee has identified several options for potential shoreline day use public access improvements. The options are discussed below.

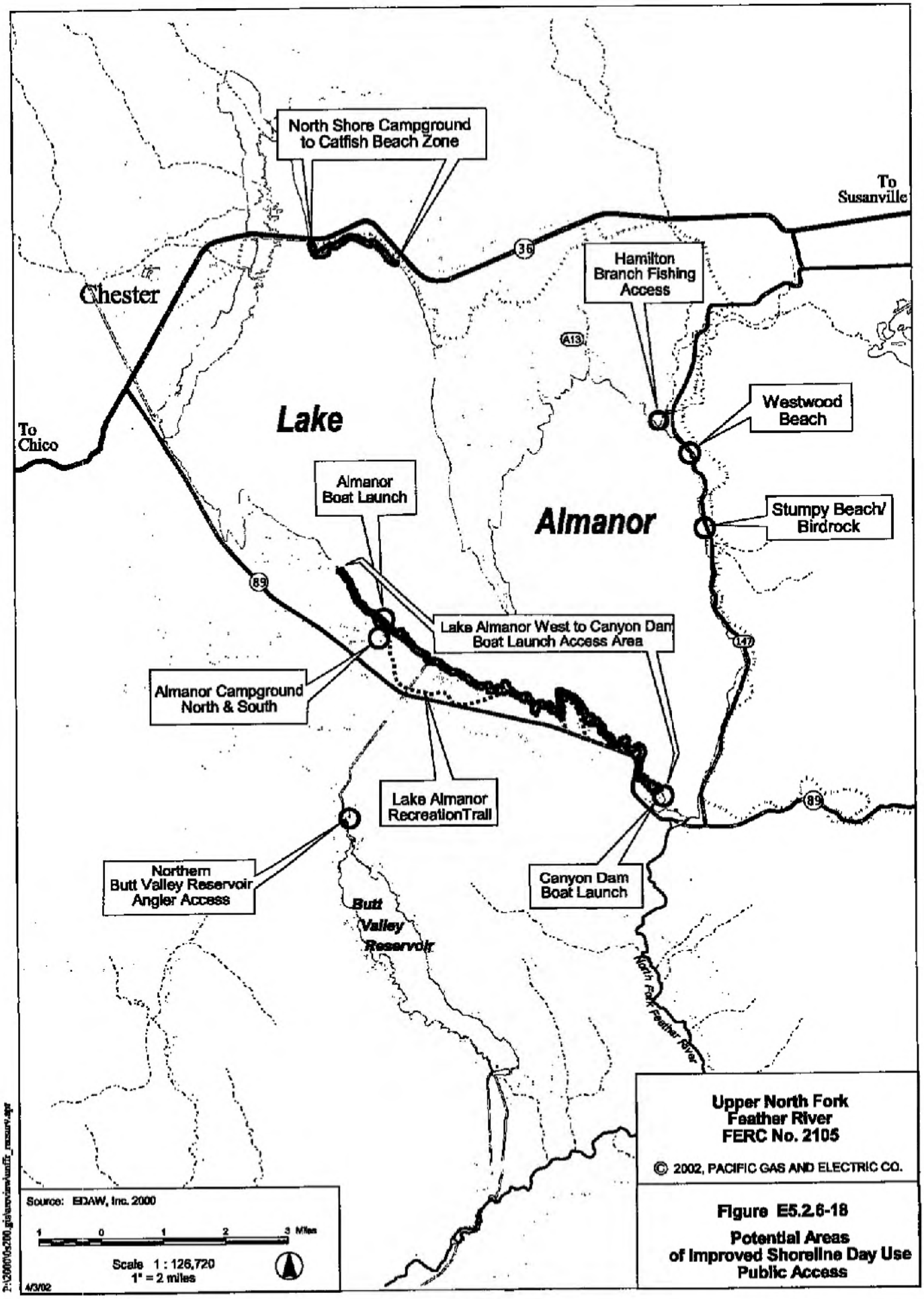
E5.2.6.5.2.1 Licensee-Identified Options

Lake Almanor—North Shore

North Shore Campground Area to Catfish Beach. Increased shoreline day use public access to the northern portion of Lake Almanor is needed to improve access for the residents of the town of Chester.

This zone is on the northern shoreline of Lake Almanor and on the eastern side of the SR 36 causeway. Some of this northern shoreline zone is already leased to a private recreation provider (North Shore Campground) by the Licensee. To meet the need for a public boat launch facility near the town of Chester, the Licensee is proposing a new renovated and relocated boat launch at the existing North Shore Campground. This new boat launch would be a public, commercially run facility operated on Licensee-owned land (see Figure E5.2.6-18 Potential Areas of Improved Public Access). The Licensee would construct the new boat launch with a loading float, vault toilet and boat house facilities, trailer and single vehicle parking, and a new separate access road along an old abandoned highway roadway. Also, the Licensee has proposed two shoreline access sites near the town of Chester. One proposal is located at Stover Ranch, a ranch site to the southeast of downtown Chester with excellent views of Lake Almanor and the surrounding mountains. The Licensee would construct trails, picnic tables, a vault toilet, and interpretive signage. A host/caretaker RV site would also be provided at this location to increase the management presence in this area.

Southwest of Chester near the intersection of SR 36 and SR 89, another shoreline access site is proposed where the existing Super Channel empties into Lake Almanor. A parking area is proposed near an existing levee road, along with barricades to restrict vehicular access to the shoreline. Both of these sites could potentially serve as trailheads to a potential LART extension.



Nearby, to the east, another north shore site with historical recreation use, but closed in 2001 to vehicular traffic, is Catfish Beach (see Figure E5.2.6-18). This site was closed to vehicular access because of reoccurring vandalism and resource protection needs. Future access options to this shoreline site are possible via boat-in, walk-in, and drive-in means.

Proposals for the Catfish Beach area include a primitive day use site with some overnight camping. Vehicle access to Catfish Beach is proposed along an improved gravel road. Fencing and other barriers that were recently erected would be modified. The Licensee does not own all of the land where road access would likely be located. Therefore, a road easement across private land is needed.

Lake Almanor—East Shore

Hamilton Branch Fishing Access. The general public currently accesses the Hamilton Branch area for bank and boat fishing near Hamilton Branch Powerhouse, a non-Project facility operated by the Licensee.

The area immediately upstream from Hamilton Branch Powerhouse has been improved in 2002 to enhance public fishing access (see Figure E5.2.6-18). This area is located on the northeastern shoreline of Lake Almanor, on the reservoir side of the intersection of SR 147 and A13. DFG purchased a 3-acre parcel of land at this location and has developed it to provide anglers access to fishing opportunities on Hamilton Branch. A trail now provides pedestrian access to the shoreline from a new gravel parking lot with a new access driveway. There is currently a portable toilet at the site, though DFG hopes to

provide a vault toilet and picnic tables in the future. The Almanor Angler Association manages this site.

Westwood Beach Area. Additional public access is needed along the eastern shoreline of Lake Almanor for area residents to access the shoreline and for visitors arriving by vehicle. Located on the eastern shoreline of Lake Almanor, the Westwood Beach area is also being considered as a location for a new DUA (see Figure E5.2.6-18).

The Westwood Community Services District owns this parcel of land for use by Westwood-area residents. This area is currently undeveloped but is used primarily by local residents. Currently, there is little more than an enlarged pull-off area on the reservoir side of SR 147 and access to the shoreline.

Development at Westwood Beach is contingent on being able to provide safe access to/from SR 147. The new ingress/egress for the parking lot would be at the north end of the site, as far from the curve in SR 147 as possible, to allow adequate sight lines for drivers. This design solution appears feasible based on site observations and discussions with California Department of Transportation (Caltrans) in 2002. A small parking area for up to 10 vehicles, designated access trails, up to six picnic tables, and a sealed vault toilet (if approved by Plumas County) or portable toilet is proposed at Westwood Beach. Locating a toilet at this site may not be possible, however, because toilets must be at least 50 feet from the high water line. Most of the day use facilities, such as picnic tables, would be located at the southern end of the site. However, the entire length of the site

offers scenic vista points. Benches could be placed at the shoreline. The shoreline is eroding (low bank) and would need to be stabilized to minimize future erosion, caused by wind waves.

Stumpy Beach Area

The eastern shoreline of Lake Almanor in general lacks public shoreline access. There are several private commercial resorts, but no non-commercial public access sites. Additional public access is needed in this area, particularly for residents to access the shoreline and for visitors arriving by vehicle.

The area north of Birdrock and around Stumpy Beach, located on the eastern shoreline of Lake Almanor, is being considered for a new DUA (see Figure E5.2.6-18).

Caltrans owns this site and all potential development would need to be coordinated with this agency, as a potential parallel parking area would have to be located within the SR 147 right-of-way. The existing area consists of a small, paved pullout (little more than a widened shoulder) and a few user-defined trails leading to the shoreline. The relatively small area is sandwiched between private property and the shoreline and shows minimal signs of use. Additionally, during high pool elevations, there is no beach at this site.

Potential development at this site is contingent on being able to provide safe access off of SR 147 and approval from Caltrans. Proper signage would be needed to warn vehicles travelling on SR 147 to be aware of vehicles turning in and out of the Stumpy Beach area.

A small parking area for eight to 10 vehicles, designated access trails, five picnic tables, and a sealed vault toilet (or portable toilet) are proposed at Stumpy Beach. Locating a toilet at this site may not be possible, however, because toilets must be at least 50 feet from the high water line. Adequate ingress/egress along the highway appears to be feasible based on site observations and discussions with Caltrans in 2002.

Lake Almanor—Southwest Shoreline Access Zone

Lake Almanor West to Canyon Dam Boat Launch/DUA (Primarily the Prattville to Lake Almanor Campground Access Area). This zone is a popular area for vehicular and pedestrian access to the reservoir shoreline, particularly when the reservoir is drawn down (see Figure E5.2.6-18).

Vehicles can access this zone from several (4 to 8) locations off of SR 89 and Almanor Drive West. Gentle slopes at several locations provide vehicle access to the reservoir lakebed. Some areas are only accessible by 4-wheel drive vehicles.

This zone, or segments thereof, could be defined as the primary area for vehicle access to the reservoir shoreline on Lake Almanor (to the high pool level or 4,494-foot elevation (Licensee 1997). Designating access routes would need to be coordinated with the Forest Service, as current access roads are on Forest Service-managed land; and with the Licensee, as allowing access to the 4,494 feet-high water level would be necessary. Several access roads (approximately four) may be considered for improvement to better control vehicular and pedestrian access the shoreline area.

Potential access improvements include barricading other vehicle access routes (approximately 4) to the shoreline, rehabilitating some of these disturbed areas where roads were previously located, providing proper signage, providing user education, and providing ongoing monitoring and law enforcement.

Other undeveloped vehicle access points on Lake Almanor should likely be barricaded (fencing, logs, or boulder placement) and likely rehabilitated to protect sensitive ecological and cultural resources and to minimize erosion. Two to three of these access routes have already been barricaded by the Forest Service, at least temporarily. Signage and other means of distributing information should be used to inform visitors and residents of new access restrictions in this area, and to educate them about the detrimental environmental effects of vehicular use in these sensitive areas.

Butt Valley Reservoir

Northern Butt Valley Reservoir Angler Access. Existing public shoreline access at the northern end of Butt Valley Reservoir is currently provided in several locations via dirt access trails that have been developed by anglers. The area adjacent to Butt Valley Powerhouse is very popular with anglers. Some of these trails are steep and eroded. To enhance angler access, reduce erosion, and improve trail safety, two new trail access routes and parking areas may be considered in this area.

Other dispersed sites may also be considered at Butt Valley Reservoir, including approximately five small boat-in dispersed sites on the western shoreline of the reservoir,

approximately three walk-in dispersed sites on the western shoreline near the dam, and approximately three pull-outs with parking and trails to the shoreline along the county road on the east side of the reservoir.

E5.2.6.5.2.2 Forest Service Identified Areas

In addition to potential site improvements being considered by the Licensee, the Forest Service also plans on renovating and improving several of its existing shoreline access sites. The Forest Service has identified the sites listed below for improvements.

Almanor Campground (North and South Units)

The Forest Service plans to renovate Almanor Campground (North and South) (see Figure E5.2.6-18). The goals of the reconstruction project are to develop ADA-accessible sites, pave trails, and improve internal circulation. Additionally, as part of this project, the Forest Service plans on renovating the existing Almanor Rest Area (Almanor Picnic Area). The existing group campground would also be relocated to a new site east of SR 89 and the existing overflow camping area may be closed and rehabilitated. The existing amphitheater area may also be renovated. These renovations are expected to occur as part of a 2006 Capital Improvement Program Project.

Almanor Boat Launch

The Forest Service plans to renovate the existing Almanor Boat Launch (see Figure E5.2.6-18). Planned improvements include resurfacing the ramp, adding two courtesy docks, repairing and repaving parking areas, widening and repaving the access road to the boat ramp and parking areas, and constructing two ADA-accessible restrooms with

improvements to the sewer system and new signs. Improvements are slated to begin in late summer 2003. This project will enhance boater access to the reservoir. These improvements will be accomplished using Cal Boating grant funds.

Canyon Dam Boat Launch/DUA

The Forest Service plans to improve the existing Canyon Dam Boat Launch/DUA (see Figure E5.2.6-18). Planned improvements include replacement of an old vault toilet with an ADA-accessible toilet, replacement of the courtesy dock, replacement and installation of traffic and interpretive signs, and installation of a potable water system. Additionally, there are plans to extend the new ADA-accessible fishing platform walkway to provide enhanced fishing access when pool levels are lower. This project will enhance boater access to the reservoir. These improvements will be accomplished using Cal Boating grant funds, pending grant application approval. Construction is likely to occur soon (2003-2004).

Lake Almanor Recreation Trail (LART)

The Forest Service plans to extend the LART another 1.5 miles, from the Licensee's Lake Almanor Campground (south end) to the Canyon Dam Boat Launch/DUA (see Figure E5.2.6-18). This project will enhance pedestrian and bicycle access in the area and provide an improved southern terminus for this very popular trail. The LART has been proposed as a National Recreation Trail by the Forest Service.

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E5.2.7 Recreation Suitability Analysis

E5.2.7.1 Introduction

This section presents the results of the Recreation Suitability Analysis, one of several recreation studies that were conducted by the Licensee for relicensing.

E5.2.7.1.1 Objectives of the Study

The objective of this study is to identify areas that are suitable for potential new recreation facility development (expansion of existing facilities and new site development) consistent with the resource opportunities and constraints of the Project area. The overall analysis assesses the suitability of existing Project area lands to accommodate potential new recreation development, if needed to help meet existing and future recreation demand.

For potential new recreation facility development, two planning scenarios were considered. The first emphasizes the recreational experiences of visitors, while the second emphasizes the protection of the Project's unique resources.

This study focuses on the recreation development suitability of the shorelines of the Project area reservoirs and river reaches within 0.25-mile of the Federal Energy Regulatory Commission (FERC) Project boundary.

This information will be used to determine possible areas for new recreation development and/or expansion to accommodate existing and future recreation needs as discussed in Section E5.2.9—Recreation Needs Analysis Synthesis.

E5.2.7.1.2 Components of the Study

This study provides an analysis of recreation site development suitability using GIS technology which assessed opportunities and constraints to potential recreation development in the study area, such as new campgrounds or day use areas (DUAs). GIS recreation opportunity and constraint maps from the Shoreline Day Use Public Access Analysis (see Section E5.2.6) were used as a starting point to create recreation site development suitability maps for this study. The composite GIS suitability maps were developed to visually display the areas with the greatest potential for new public recreation development.

E5.2.7.2 Study Area

The study area includes all lands and waters within 0.25 mile of the FERC Project boundary surrounding Lake Almanor and Butt Valley Reservoir, as well as Seneca and Belden Reaches. The Project's water conveyance system corridors (canals, pipelines, flumes, penstocks, etc.) are excluded from this analysis as the public is generally discouraged from using these types of Project facilities for recreation purposes.

The existing public developed recreation sites listed below are included in this analysis and displayed in Figure E5.1-1.

- Lake Almanor Campgrounds (Loops 1, 2, and 3) (Licensee);
- Camp Conery Group Camp (Licensee);
- Canyon Dam DUA (Licensee);
- Almanor Scenic Overlook (Licensee);
- Eastshore DUA Area (Licensee);
- Last Chance Campground/Group Camp (Licensee);
- Ponderosa Flat Campground (Licensee);
- Alder Creek DUA/Boat Launch (Licensee);
- Cool Springs Campground (Licensee);
- Belden Rest Stop on state route (SR) 70 (Licensee);
- Almanor Campground (United States Forest Service [Forest Service]);
- Almanor Boat Launch (Forest Service)
- Almanor Beach
- Canyon Dam Boat Launch/DUA (Forest Service);
- Almanor Rest Area on SR 89 (Forest Service);
- Dyer View DUA
- Gansner Bar Campground (Forest Service);
- North Fork Campground (Forest Service); and
- Queen Lily Campground (Forest Service).

The following undeveloped dispersed sites were also considered in the analysis (see Figure E5.1-2):

- 24 undeveloped dispersed lakeside sites at Lake Almanor;
- Three undeveloped dispersed lakeside sites on Butt Valley Reservoir;
- Two undeveloped dispersed riverside sites on the Seneca Reach; and
- 20 undeveloped dispersed riverside sites on the Belden Reach.

Additionally, the 31 private recreation facilities listed below (both open and closed to public use) were included in the analysis (see Figure E5.1-3).

- Almanor Lakefront Village
- Almanor Lakeside Resort
- Almanor Lakeside Villas
- Big Cove Resort
- Caribou Corners
- Carson's Cabins
- Cashman's Paul Bunyan Resort
- Country Club Resorts
- Dorado Inn
- High Sierra Resort
- Knotty Pine Resort
- Lake Almanor Resort
- Miller's Resort
- Moonspinners Resort
- North Shore Campground
- Novotny's
- Plumas Pines Resort
- Swim Inn
- Vagabond Resort
- Villager Resort
- Wilson's Camp Prattville
- Lake Almanor West DUA
- Lake Almanor West Boat Ramp
- PG&E Service Employees Association (PSEA)

- Lake Cove Resort
- Lake Haven Resort
- Lassen View Resort
- Little Norway Resort
- Hamilton Branch DUA/Boat Ramp
- Lake Almanor County Club 1
- Lake Almanor Country Club 2

E5.2.7.3 Methods

This study provides an analysis of the suitability of potential recreation development that balances recreation needs and visitors' experiences with resource protection and land use/management needs. This study focuses largely on Project reservoir shorelines; however, Belden and Seneca Reaches are also examined.

The ability of the Project area to accommodate any new potential recreation site development was assessed using GIS-based technology. This analysis considered a number of opportunities and constraints to recreation development at each of the Project reservoirs and bypass reaches. Recreation development opportunities and constraints are described in more detail below. This tool is a macro-scale approach and is not meant to replace on-the-ground siting techniques that may be used to develop specific protection, mitigation, and enhancement measures (PMEs) in the future. Rather, this tool is used to answer broader questions relating to potential recreation facility siting. The results of this study will be used to provide resource/recreation compatibility information and provide descriptions of areas for potential recreation facilities.

For example, if a new campground is needed in the future to satisfy demand, possible sites can be determined for consideration. The tasks that were necessary to complete the study are presented below.

E5.2.7.3.1 GIS Data Layer Review and Identification

Opportunities and constraints to potential recreation site development were assessed using a series of available GIS data layers from the Shoreline Day Use Public Access Analysis (see Section E5.2.6). Specific public access opportunity and constraint GIS data layers used in the access assessment are listed below.

Recreational Opportunities for Shoreline Day Use Public Access

- Existing recreation sites (Licensee and Forest Service)
- Existing trails
- Existing roads
- Licensee land (excluding Project hydroelectric facilities)
- Public land
- Slopes of 0 to 40 percent (high=0–20 percent; moderate=20–40 percent)

Recreation Constraints for Shoreline Day Use Public Access

- Project hydroelectric facilities
- Non-Licensee private land
- Biological constraints (including special status plants, sensitive nest sites, and wetland/riparian areas)

- Areas of shallow water depth
- Restricted areas (due to safety concerns)
- Slope greater than 40 percent

The recreational opportunities and constraints used in Section E5.2.6 were further broadened for this analysis to include the elements listed below.

Recreational Opportunities for Recreation Suitability

- Within 0.25 mile of Project shorelines/riverbanks
- Existing recreation sites (Licensee and Forest Service)
- Existing trails
- 1000-feet from existing roads
- Licensee land (excluding Project hydroelectric facilities)
- Public land
- Slopes of 0 to 40 percent (high=0–20 percent; moderate=20–40 percent)

Recreation Constraints for Recreation Suitability

- Project hydroelectric facilities
- Non-Licensee private land
- Identified areas of significant shoreline erosion
- Within 100-feet of special status vegetation
- Within 0.25-mile radius around bald eagle nests
- Within 350-feet of sensitive bird nests (other than bald eagles)

- Within 100-feet of cultural sites
- Wetlands
- Sensitive vegetation communities
- Slope greater than 40 percent

Cultural resource sites or areas were also considered; however, this review was conducted manually.

E5.2.7.3.2 Analysis of Recreational Opportunities

This task identified areas of recreational opportunity that may be considered for future recreation development or dispersed recreation use. Using the GIS data layers and polygons listed in Section E5.2.7.3.1, "opportunity" polygons were identified and mapped. Such areas are considered to have environmental conditions which favor recreation development or use. Each opportunity variable/polygon was ranked as high, moderate, or low. Once ranked, the GIS data layers were overlayed and a map showing these three categories was produced. After reviewing and refining the maps, the rankings were revised, as needed, and the GIS set re-run to produce a final opportunity overlay map set.

E5.2.7.3.3 Analysis of Recreation Constraints

This task identified areas of recreation constraint that may be considered for future development or dispersed use. Using the GIS data layers and polygons listed in Section E5.2.7.3.1, "constraint" polygons were identified.

Constraint mapping was used to examine and identify appropriate buffering for critical resources including incompatible land uses; sensitive cover type/critical habitat; stream corridors; steep slopes; erosion hazards; sand dunes; and other constrained areas. Certain ownership values were also identified as constraints to future suitability. Areas where recreation development is not possible were excluded from the analysis. These areas include all surface water areas and Project hydroelectric facilities.

Each constraint variable/polygon was as high, moderate, or low. Once ranked, the GIS data layers were overlayed and a map showing these three categories was produced. After reviewing and refining the map, the rankings were revised, as needed, and the GIS set re-run to produce a final constraint overlay map set. Cultural resource sites and areas were also considered constraints for this analysis, however, these sites/areas were not added to the constraints maps.

E5.2.7.3.4 Analysis of Recreation Development Suitability

The opportunity and constraint maps were overlayed to develop a composite suitability map depicting areas of high, moderate, and low recreation development suitability. Recreation suitability classifications and corresponding rankings are listed in Table E5.2.7-1. The resulting composite suitability map shows the most suitable sites (or polygons) for future potential recreation development, if needed. For example, highly suitable potential recreation development areas are those where high opportunities and low or no constraints exist, whereas lower suitable potential recreation areas will be those where high constraints and low or no opportunities exist.

Table E5.2.7-1
Recreation Suitability Classifications and Rankings Considered

Suitability Classification		Suitability Ranking			
		High	Moderate	Low	Excluded
Water	Reservoirs/Rivers				X
Project Facilities	Dams, Powerhouses, etc.				X
Recreation Use	Existing Public Recreation Sites	X			
	Proximity to Existing Public Recreation Sites	<250 feet			
	Dispersed Sites		X		
	Private Commercial Resorts (open to the public)		X		
	Private Recreation Facilities (closed to the public)			X	
	Private Residential Facilities (closed to the public)			X	
Slope	0–20 percent	X			
	20–40 percent		X		
	Greater than 40 percent			X	
Property Ownership	Licensee	X			
	Forest Service	X			
	Private Commercial (Big Cove Private Commercial Zone)		X		
	Private Undeveloped		X		
	Private Developed			X	
Road Access	Proximity to Existing Highways and Connectors	<1000 feet	>1000 feet		
Shoreline Erosion	Proximity to Known Areas of Significant Erosion		<250 feet		
Special Status Plants	Proximity to Identified Plant		<500 feet	<100 feet	
Sensitive Nest Sites	Bald Eagle		<0.5 mile	<0.25 mile	
	Other		<600 feet	<350 feet	
Wetlands/Riparian	Existing			X	
	Identified Inundation Area			X	
	Proximity to Existing Wetland/Riparian Area		<250 feet		

Source: EDAW, Inc.

As displayed in Table E5.2.7-1, in order for an area to be categorized as highly suitable, it must meet the criteria listed in the "High" column including: existing public recreation site or within a 250-foot buffer of an existing recreation site, slope of 0 to 20 percent, Licensee or Forest Service land, and within 1000 feet of an existing highway or connector road. On the recreation development suitability maps, areas of highly suitable land appear in green.

In order for an area to be categorized as having low recreation development suitability, it must meet at least one of the criteria listed in the "Low" column of Table E5.2.7-1.

These criteria include: private recreation facilities, slopes of over 40 percent; privately-owned and -developed land; within 100 feet of an identified special status plant; within 0.25 mile of an existing bald eagle nest; within 350 feet of other sensitive bird species' nests; and the presence of a wetland, riparian, or inundation area. On the recreation development suitability maps, areas of lower suitability appear in red.

Areas categorized as having moderate recreation development suitability must meet some combination of the criteria listed in the "Moderate" column of Table E5.2.7-1. These criteria include:

- Existing dispersed recreation sites; private commercial resorts (open to the public);
- Slopes of 20 to 40 percent;
- Private undeveloped land;

- Private commercial land (Big Cove Commercial Zone);
- More than 1,000 feet from an existing highway or connector road;
- Within 250 feet of a significant shoreline erosion area;
- Within 500 feet of a special status plant;
- Within 0.5 mile of an existing bald eagle nest;
- Within 600 feet of other sensitive bird species' nests, and
- Within 250 feet of a wetland or riparian area.

On the recreation development suitability maps, areas identified as having moderate suitability appear in yellow.

On the GIS recreation development suitability maps, the three suitability rankings represent composite conditions comprised of the criteria described above. General conclusions can be drawn from these maps, such as an area being categorized as having either high, moderate, or low suitability for recreation development. More specific conclusions pertaining to why a particular area falls within a certain suitability ranking cannot be identified on these figures. If more detail is needed on a specific area, the opportunity, constraints, or other resource maps should be consulted.

Acreage by ranking (high, moderate, and low) was determined and calculated based on the recreation development suitability maps for the Project area and each recreation resource area (Lake Almanor, Butt Valley Reservoir, and the river reaches).

Two sets of acreage calculations were developed based on differing planning scenarios: purely recreation development focus, and more balanced recreation development and resource protection focus.

Due to the GIS pixel size and macro-scale of some of the GIS data layers used, this type of analysis tends to work well for identifying suitable larger polygons (campgrounds and day use sites), but is less successful in locating linear polygons such as trail corridors or small points. This analysis does not replace the need for a thorough on-site analysis, but can help focus decision-makers' attention to relevant areas. Following completion of the suitability mapping, recommendations were made concerning areas that may be considered later for potential recreation development.

E5.2.7.4 Results and Discussion

Recreation site development suitability was assessed using GIS technology to overlay and prioritize (high to low) a number of important opportunity and constraint factors. The opportunities and constraints for each recreation resource area (Lake Almanor, Butt Valley Reservoir, and Belden and Seneca Reaches) are detailed in the Shoreline Day Use Public Access Analysis (see Section E5.2.6.4).

Three GIS mapping products were developed for each reservoir and the reaches including an opportunity map, constraints map, and recreation suitability map. The GIS opportunity and constraint maps are discussed in Section E5.2.6.4, and presented as Figures E5.2.6-1 and E5.2.6-2.

Additional maps were developed for this analysis and are presented below.

This GIS-based analysis is a planning tool intended to identify potential areas for possible recreation development in the 44,439-acre (includes surface water acres) Project area, should new facilities be needed to satisfy existing or future recreation needs. Because of the larger pixel size and larger scale of some of the GIS data layers, this analysis is not intended to be used to site small-scale development, such as trails. Some areas, called excluded areas, were removed from this GIS recreation development suitability analysis. The surface water areas of Lake Almanor and Butt Valley Reservoir are not rated and are shown as a blue color on the figures. Project hydroelectric facilities, labeled and shown in red, were also excluded. Excluded areas account for approximately 61 percent of the study area (see Table E5.2.7-2). The remaining 17,384 acres (39 percent) of the Project area are addressed in this analysis.

Table E5.2.7-2
Acreage of Land in the UNFFR Recreation Suitability Analysis

Site	Acreage	Percentage of Recreation Resource Area Acreage	Percentage of Total Project Area Acreage
Lake Almanor	34,356	—	77
Excluded	25,326	74	57
Included	9,030	26	20
Butt Valley Reservoir	3,570	—	8
Excluded	1,559	44	4
Included	2,011	56	5
Bypass Reaches	6,513	—	15
Excluded	170	3	0.4
Included	6,343	97	14
Project Area	44,439	—	—
Excluded	27,055	—	61
Included	17,384	—	39

Source: EDAW, Inc.

Suitability for potential recreation development at the Project area is graphically presented in Figures E5.2.7-1 through E5.2.7-11. Categories of suitability for recreational development are presented using a 3-level scale (high, moderate, and low), described in detail in Section E5.2.7.3.4—Analysis of Recreation Development Suitability. A complete list of opportunity and constraint factors and rankings that were compiled to create the recreation development suitability analysis is presented in Table E5.2.7-1.

The acreage and percentage (does not include excluded areas) of potential areas of high to low suitability for recreation development in the Project area are presented in Table E5.2.7-3.

Table E5.2.7-3
UNFFR Recreation Development Suitability Rankings

Level	Recreation Development		Recreation Development with Resource Protection		Percent Change in Acreage
	Acreage	Percentage	Acreage	Percentage	
High	3,252	19.0	1,849	11	-43
Moderate	4,393	25.0	3,718	21	-15
Low	9,740	56.0	11,817	68	+21
Total	**17,384**	**100.0**	**17,384**	**100**	—

Source: EDAW, Inc.

Recreation Development Focus

Acreage in the Project area was first calculated with a purely recreation development focus. Potential areas of high suitability for recreation development make up approximately one-fifth (3,252 acres or 19 percent) of the Project area. Areas of moderate recreation development suitability account for approximately a quarter (4,393 acres or 25 percent) of the land.

However, the majority of land, over 50 percent (9,740 acres), in the Project area falls into the lowest suitability ranking (see Table E5.2.7-3).

Balanced Recreation-Resource Protection Focus

Acreage in the Project area was next calculated with a more balanced recreation development and resource protection focus. Potential areas of high suitability for recreation development make up approximately 10 percent (1,849 acres) of the Project area with this focus. This equates to an overall decrease in acreage from the purely recreation development focus of approximately 43 percent.

Acres of moderate recreation development suitability account for approximately two-fifths (21 percent or 3,718 acres) of land, a decrease in acreage of 15 percent from the purely recreation development focus. Using a more balanced focus to determine recreation development suitability increases the acreage of low ranked areas to 11,817 (68 percent). This is an increase in acreage of approximately 21 percent (see Table E5.2.7-3).

The remaining analysis of the GIS recreation development suitability maps is presented below in four sections: Lake Almanor recreation development suitability, Butt Valley Reservoir development suitability, Belden and Seneca Reaches recreation development suitability, and areas for potential future recreation development.

E5.2.7.4.1 Lake Almanor Recreation Suitability Analysis

Suitability for potential recreation development at Lake Almanor is graphically presented in Figures E5.2.7-1 through E5.2.7-6. Categories of suitability for recreational development are presented using a 3-level scale (high, moderate, and low), as described in detail in Section E5.2.7.3.4—Analysis of Recreation Development Suitability. A complete list of opportunity and constraint factors and rankings that were compiled to create the recreation development suitability analysis is presented in Table E5.2.7-1.

The acreage and percentage (does not include excluded areas) of potential areas of high to low suitability for recreation development in the Project area at Lake Almanor are presented in Table E5.2.7-4.

Table E5.2.7-4
Lake Almanor Recreation Development Suitability Rankings

Level	Recreation Development		Recreation Development with Resource Protection		Percent Change in Acreage
	Acreage	Percentage	Acreage	Percentage	
High	2,258	25	1,231	14	-45
Moderate	2,382	26	1,623	18	-32
Low	4,391	49	6,176	68	+41
Total	**9,030**	**100**	**9,030**	**100**	—

Source: EDAW, Inc.

Recreation Development Focus

Acreage in the Lake Almanor recreation resource area was first calculated with a purely recreation development focus. Potential areas of high suitability for recreation development make up approximately a quarter (2,258 acres or 25 percent) of the Lake Almanor recreation resource area. Areas of moderate recreation development suitability account for approximately another quarter (2,382 acres or 26 percent) of the land.

However, the majority of land, nearly 50 percent (4,391 acres), in the Lake Almanor recreation resource area falls into the lowest suitability ranking (see Table E5.2.7-4).

Balanced Recreation-Resource Protection Focus

Acreage in the Lake Almanor recreation resource area was next calculated with a more balanced recreation development and resource protection focus. Potential areas of high suitability for recreation development make up 14 percent (1,231 acres) of the Lake Almanor recreation resource area with this focus. This equates to an overall decrease in acreage from the purely recreation development focus of approximately 45 percent. Acres of moderate recreation development suitability account for approximately one-fifth (18 percent or 1,623 acres) of land, a decrease in acreage of 33 percent from the purely recreation development focus. Using a more balanced focus to determine recreation development suitability increases the acreage of low ranked areas to 6,176 (68 percent). This is an increase in acreage of approximately 41 percent (see Table E5.2.7-4).

Based on the balanced recreation development and resource protection approach to determining recreation development suitability, the highest-ranked suitability areas and a few moderately-ranked areas on the GIS-based maps (see Figures E5.2.7-1–E5.2.7-6) were identified. All identified suitable locations for potential recreation development were manually reviewed against cultural resource maps. Locations where mitigation is not likely possible or where significant cultural resources exist were removed from consideration as potential areas for recreation development.

The following locations for potential recreation development exist at Lake Almanor:

- North Shore Campground;
- Catfish Beach;
- Southeast Zone—Extends approximately 2 miles north from the existing Almanor Scenic Overlook and includes the Eastshore DUA;
- Canyon Dam DUA;
- Camp Conery Group Site;
- Area north of Canyon Dam Boat Launch/DUA;
- Area north of Lake Almanor Campground (Loop 1);
- Area between Lake Almanor Campground and Dyer View DUA;
- Dyer View DUA;
- Hamilton Branch Fishing Access Site—upstream from the Hamilton Branch Powerhouse;
- Westwood Beach area;
- Stumpy Beach/Birdrock area; and
- Area south of Lake Almanor West (Collins Pine Land).

A detailed description of potential recreation developments at these identified areas is discussed in Section E5.2.7.4.4. Other areas on the GIS maps that were identified as highly suitable recreation development areas, but are not being considered for potential development due to shallow or no water access, include:

- 4 areas near the town of Chester; and
- 1 area north of Lake Almanor West at the cove—some private land.

E5.2.7.4.2 Butt Valley Reservoir Recreation Suitability Analysis

Suitability for potential recreation development at Butt Valley Reservoir is graphically presented in Figure E5.2.7-7. Categories of suitability for recreational development are presented using a 3-level scale (high, moderate, and low), described in detail in Section E5.2.7.3.4—Analysis of Recreation Development Suitability. A complete list of opportunity and constraint factors and rankings that were compiled to create the recreation development suitability analysis is presented in Table E5.2.7-1.

The acreage and percentage (does not include excluded areas) of potential areas of high to low suitability for recreation development in the Project area at Butt Valley Reservoir are presented in Table E5.2.7-5.

Table E5.2.7-5
Butt Valley Reservoir Recreation Development Suitability Rankings

Level	Recreation Development		Recreation Development with Resource Protection		Percent Change in Acreage
	Acreage	Percentage	Acreage	Percentage	
High	593	29	382	19	-36
Moderate	865	43	952	47	+10
Low	554	28	678	34	+22
Total	**2,011**	**100**	**2,011**	**100**	—

Source: EDAW, Inc.

Recreation Development Focus

Acreage in the Butt Valley Reservoir recreation resource area was first calculated with a purely recreation development focus. Potential areas of high suitability for recreation development make up over a quarter (593 acres or 29 percent) of the Butt Valley Reservoir recreation resource area.

Areas of moderate recreation development suitability account for the greatest number of acres around Butt Valley Reservoir, approximately 865 acres (43 percent). Additionally, over a quarter (28 percent or 554 acres) of land in the Butt Valley Reservoir recreation resource area falls into the lowest suitability ranking (see Table E5.2.7-5).

Balanced Recreation-Resource Protection Focus

Acreage in the Butt Valley Reservoir recreation resource area was next calculated with a more balanced recreation development and resource protection focus. Potential areas of high suitability for recreation development make up 19 percent (382 acres) of the Butt Valley Reservoir recreation resource area with this focus. This equates to an overall decrease in acreage from the purely recreation development focus of approximately 36 percent. Acres of moderate recreation development suitability account for approximately half (47 percent or 952 acres) of land, an increase in acreage of 10 percent from the purely recreation development focus. Using a more balanced focus to determine recreation development suitability increases the acreage of low ranked areas to 678 (34 percent). This is an increase in acreage of approximately 22 percent (see Table E5.2.7-5).

Based on the balanced recreation development and resource protection approach to determining recreation development suitability, the highest-ranked suitability areas and a few moderately-ranked areas on the GIS-based maps (see Figure E5.2.7-7) were identified. All identified suitable locations for potential recreation development were manually reviewed against cultural resource maps.

Locations where mitigation is not likely possible or where significant cultural resources exist were removed from consideration as potential areas for recreation development. The following locations for potential recreation development exist at Butt Valley Reservoir:

- Three areas south of Cool Springs Campground on the east shore;
- Three areas/zones on the west shore;
- One area/zone west of the dam; and
- Butt Valley Powerhouse area.

A detailed description of potential recreation developments at these identified areas is discussed in Section E5.2.7.4.4.

E5.2.7.4.3 Belden and Seneca Reaches Recreation Suitability Analysis

Suitability for potential recreation development at Belden and Seneca Reaches is graphically presented in Figures E5.2.7-8 through E5.2.7-11. Categories of suitability for recreational development are presented using a 3-level scale (high, moderate, and low), described in detail in Section E5.2.7.3.4—Analysis of Recreation Development Suitability. A complete list of opportunity and constraint factors and rankings that were compiled to create the recreation development suitability analysis is presented in Table E5.2.7-1.

The acreage and percentage (does not include excluded areas) of potential areas of high to low suitability for recreation development in the Project area at Belden and Seneca Reaches are presented in Table E5.2.7-6.

Table E5.2.7-6
Belden and Seneca Reaches Recreation Development Suitability Rankings

Level	Recreation Development		Recreation Development with Resource Protection		Percent Change in Acreage
	Acreage	Percentage	Acreage	Percentage	
High	401	6	237	4	—41
Moderate	1,146	18	1,143	18	—
Low	4,795	76	4,963	78	+4
Total	**6,343**	**100**	**6,343**	**100**	—

Source: EDAW, Inc.

Recreation Development Focus

Acreage in reaches recreation resource area was first calculated with a purely recreation development focus. Potential areas of high suitability for recreation development make up very little (401 acres or 6 percent) of the area. Areas of moderate recreation development suitability account for approximately one-fifth (1,146 acres or 18 percent) of the land. However, the majority of land, over 75 percent (4,795 acres), along Seneca and Belden Reaches falls into the lowest suitability ranking (see Table E5.2.7-6).

Balanced Recreation-Resource Protection Focus

Acreage in the reaches recreation resource area was next calculated with a more balanced recreation development and resource protection focus. Potential areas of high suitability for recreation development make up only 4 percent (237 acres).

This equates to an overall decrease in acreage from the purely recreation development focus of approximately 41 percent. Acres of moderate recreation development suitability remain essentially unchanged (1,143 acres or 18 percent) from the purely recreation development focus. Using a more balanced focus to determine recreation development suitability increases the acreage of low ranked areas to 4,963 (78 percent). This is an increase in acreage of approximately 4 percent (see Table E5.2.7-6).

Based on the balanced recreation development and resource protection approach to determining recreation development suitability, the highest-ranked suitability areas and a few moderately-ranked areas on the GIS-based maps (see Figures E5.2.7-8–E5.2.7-11) were identified. All identified suitable locations for potential recreation development were manually reviewed against cultural resource maps. Locations where mitigation is not likely possible or where significant cultural resources exist were removed from consideration as potential areas for recreation development. The following locations for potential recreation development exist along Seneca and Belden Reaches:

- Area near gauging station below Belden Forebay Dam;
- Gansner Bar Campground area;
- Seneca Bridge area; and
- Area on western shoreline of the Belden Forebay, near Caribou Village.

A detailed description of potential recreation developments at these identified areas is discussed in Section E5.2.7.4.4.

Various other areas of highly suitable land were identified along the reaches on the GIS maps, but are not being considered for potential development due to a lack of access to the water.

E5.2.7.4.4 Potential Recreation Development Options at Identified Suitable Areas in the UNFFR Project Area

Based on the Project area recreation development suitability maps (see Figures E5.2.7-1–E5.2.7-11), suitable locations for potential future recreation development were identified. These locations are listed in Sections E5.2.7.4.1–E5.2.7.4.3. Prior to developing a list of potential recreation development sites, candidate locations were compared with maps depicting the sites and areas of cultural resources in the Project area (not available at the time of the GIS analysis). Suitable locations with significant cultural resources, where mitigation was not likely possible, were eliminated from consideration for potential recreation development.

None of the potential recreation development sites resulting from this analysis should be assumed to be final. On-site reconnaissance and an analysis of other recreation factors in the Project area, such as existing and projected recreation use and needs, are necessary before potential actions are finalized and site plans are proposed.

High suitability areas make up a small portion (1,849 acres or 11 percent) of the Project area (based on the balanced recreation development and resource protection focus). Some moderately ranked areas may also be considered for potential recreation development; however, the focus is on high suitability areas.

Based on the results of this GIS-based analysis (see Figures E5.2.7-1–E5.2.7-11), locations and potential actions to consider for potential future recreation development, if needed, are shown below.

Lake Almanor

- North Shore Campground—potential reconfiguration has been proposed to accommodate a boat launch facility for the residents of Chester. This proposal attempts to retain the current private operator's facilities, to the extent possible.
- Catfish Beach—potential primitive day use and campground area is proposed; requires access route across private land.
- Hamilton Branch Fishing Access Site—California Department of Fish and Game (DFG) site with trail. DFG has recently provided parking, access driveway, toilet, and trail improvements at this site.
- Westwood Beach—small shoreline day use site improvements are proposed.
- Stumpy Beach—small shoreline day use site improvements are proposed.
- Southeast Zone—2 miles of narrow, high bank Licensee land between the shoreline and SR 147, includes the existing Eastshore DUA (in the middle) and Almanor Scenic Overlook (south end). A new campground is proposed in this area, as well as a proposal to convert the existing Eastshore DUA into a group RV campsite.
- Canyon Dam DUA—expansion potential may be considered, including a possible group camp nearby.

- Camp Conery Group Site—expansion is proposed.
- Area north of Canyon Dam Boat Launch/DUA—expansion potential may be considered.
- Area north of Lake Almanor Campground (Loop 1)—expansion potential may be considered.
- Area between Lake Almanor Campground and Dyer View DUA—new site, likely shoreline day use may be considered.
- Dyer View DUA—potential expansion, shoreline day use may be considered.
- Area south of Lake Almanor West–Collins Pine Land—potential campground/DUA may be considered.

Butt Valley Reservoir

- Butt Valley Powerhouse area—an angler access trail and trailhead (Americans with Disabilities Act (ADA)-accessible) is proposed.
- Three areas south of Cool Springs Campground on the east shore—possible dispersed use shoreline sites with pull-outs are proposed.
- Three areas/zones on the west shore—possible boat-in dispersed use sites is proposed.
- Area/zone west of the Butt Valley Dam—possible walk-in dispersed shoreline use area; use of the existing gated road by dam may be considered.

Bypass Reaches

- Seneca Bridge—angler access site improvements may be considered.
- Area on western shoreline of Belden Forebay near Caribou Village—small car-top boat launch and North Fork Fishing Trail parking area; possible use of an existing parking lot north of Caribou Village by the gate is proposed.
- Area near the gauging station below Belden Forebay Dam—possible boater put-in and angler access site may be considered.
- Gansner Bar area—possible boater take-out and angler access site may be considered.

E5.2.8 Whitewater Boating Study

E5.2.8.1 Introduction

This section presents the results of the Whitewater Boating Study, one of several recreation studies that were conducted by the Licensee for relicensing.

This section describes the study effort, which included two "controlled flow" studies to explore specific effects of flows on whitewater boating and fishing, as well as a review of other information about recreational opportunities, hydrology, whitewater boating in the region, and the economic impacts and value of whitewater boating.

E5.2.8.1.1 Objectives of the Study

The overall study was designed to identify recreational opportunities on two reaches (Belden and Seneca) of the Upper North Fork of the Feather River (UNFFR) and examine how flow levels affect those opportunities. The initial focus of the study was on the feasibility of whitewater boating, the flows required for boating, and the impacts those flows may have on other recreational opportunities. Toward this end, a controlled flow study for whitewater boating was conducted in fall 2000.

Subsequent discussions with recreation advocacy groups, recreation users, and resource agencies suggested the need for additional attention to fishing and other recreational opportunities on the river. A second controlled flow study (primarily for examining fish habitat and hydrology) provided an opportunity to assess effects of flows on non-boating recreation, particularly fishing.

Specific objectives of the whitewater component of the study are listed below.

- Identify potential boating opportunities on the two reaches (with opportunities potentially varying by craft, skill level, or preferences for different types of whitewater conditions).
- Identify flow-related attributes for each of those opportunities, including a descriptions and classifications of key rapids.
- Develop relationships between flow levels and users' experiences for each boating opportunity. Resulting "flow evaluation curves" identify minimum flows and optimum flow ranges for each opportunity.
- Assess the relative "uniqueness" and importance of UNFFR boating opportunities, based a review of regional opportunities via guidebooks and a limited number of interviews with local boaters.
- Make rough estimates of boating use levels, if flows were provided for those opportunities.
- Make preliminary estimates of the economic value of whitewater boating which may be attributable to the two reaches.

Specific objectives of the fishing and other recreational opportunities are listed below:

- Identify potential fishing opportunities along the two reaches. Opportunities vary by type of tackle, technique, or target species, but the general focus was on fly-fishing, spin-fishing, and bait-fishing for trout.
- Identify flow-related attributes for each of those opportunities, including descriptions of key fishing locations.

- Develop relationships between flow levels and users' experiences for each fishing opportunity. Resulting "flow evaluation curves" identify minimum and maximum flows, as well as optimum flow ranges for each opportunity.
- Identify other river recreational opportunities (such as swimming, hiking, picnicking, and camping) and develop rough relationships between flow levels and users' experiences for each.

Finally, the study was designed to integrate information from the two components, including:

- Summarizing recreation-relevant hydrology or project operations;
- Integrating information about flow needs for boating, fishing, and other opportunities to show the impacts of providing different opportunities;
- Summarizing implications of providing boating or fishing flows (feasibility and timing); and
- Assess relative impacts to other river recreation opportunities of providing boating/fishing flows.

E5.2.8.2 Study Area

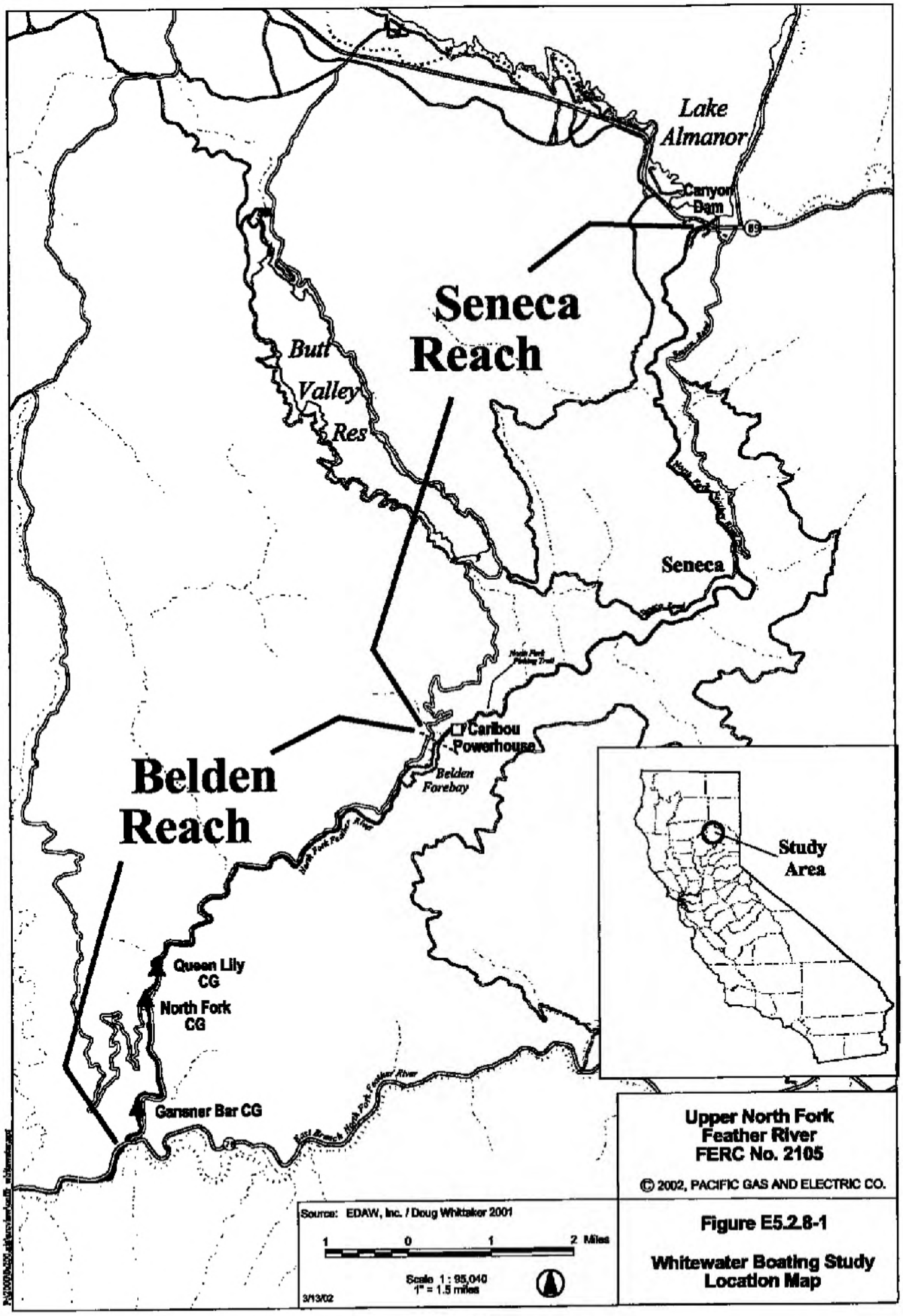
The upper segment of the UNFFR is known as Seneca Reach; it begins below Lake Almanor Dam and runs south approximately 11 miles to Caribou Powerhouse 1. The lower segment is known as Belden Reach; it begins below Caribou Powerhouse 1 and runs southwesterly approximately 9 miles to the confluence with the east branch of the North Fork of the Feather River (NFFR) near state route (SR) 70.

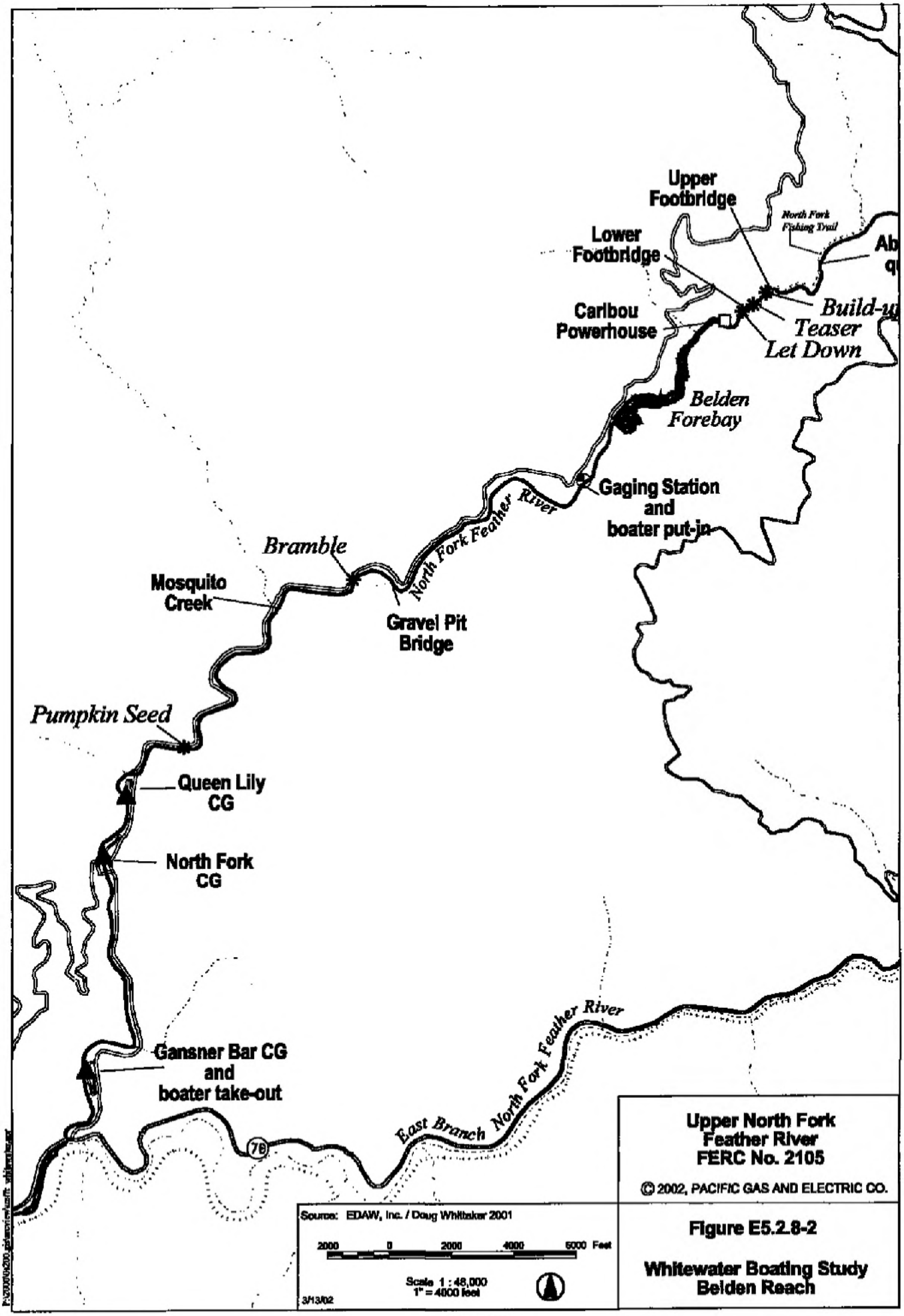
Figure E5.2.8-1—Whitewater Boating Study—Location Map, shows the Project area and the locations of the two reaches.

Belden Reach is more accessible than Seneca Reach. It runs parallel to Caribou Road (which intersects SR 70). The United States Forest Service (Forest Service) operates three campgrounds along this portion of the river: Gansner Bar, North Fork, and Queen Lily. There is also a private campground at the intersection of Caribou Road and SR 70 (Caribou Corners RV [recreational vehicle] Park). Recreation activities in this area include: camping, fishing, hiking, and swimming (see Figure E5.2.8-2—Whitewater Boating Study—Belden Reach).

Seneca Reach provides dispersed recreational opportunities such as hiking and fishing, and there are also mining operations along the reach. This portion of the UNFFR has restricted access because of the steep, rugged terrain and private in-holdings. There is a county road (CR) that begins at SR 89, near Lake Almanor Dam and leads to the small community of Seneca. There are no services in Seneca. The CR runs parallel to the UNFFR, but is usually well above the river in the canyon.

Although the river can occasionally be seen from points along the road, access to it is generally difficult and by foot only. The CR is only located close to the river as it crosses the bridge in Seneca.





There are also spur roads that approach the river in the middle and lower parts of the reach; these are private mining roads (or roads that cross private property) and it is unclear whether many recreationists use them. There is a Forest Service-maintained angler trail that travels upstream from the powerhouse at the downstream end of the reach. This appears to be well-used and -maintained for the first 3 miles or so, and includes two footbridges across the river. Figure E5.2.8-3—Whitewater Boating Study—Seneca Reach shows relevant recreation features on the reach.

E5.2.8.3 Methods

The study utilized a variety of methods, many of which are as described in greater detail in *Instream Flows for Recreation: A Handbook on Concepts and Research Methods* (Whittaker et al. 1993). Study components included: a literature review and interviews with key resource users or other experts; resource reconnaissance and photographic/videotape documentation at a variety of flow levels for both boating, fishing, and other recreational opportunities; two controlled flow assessments, during which boaters and anglers completed surveys and participated in focus groups after experiencing different flows; a regional whitewater boating opportunity review that assessed boating opportunities available in the area, using guidebooks and interviews with experienced boaters; and a literature review to examine the economic impacts and the value of whitewater boating based on previous research. More specific information about each source or component is provided in the following pages.

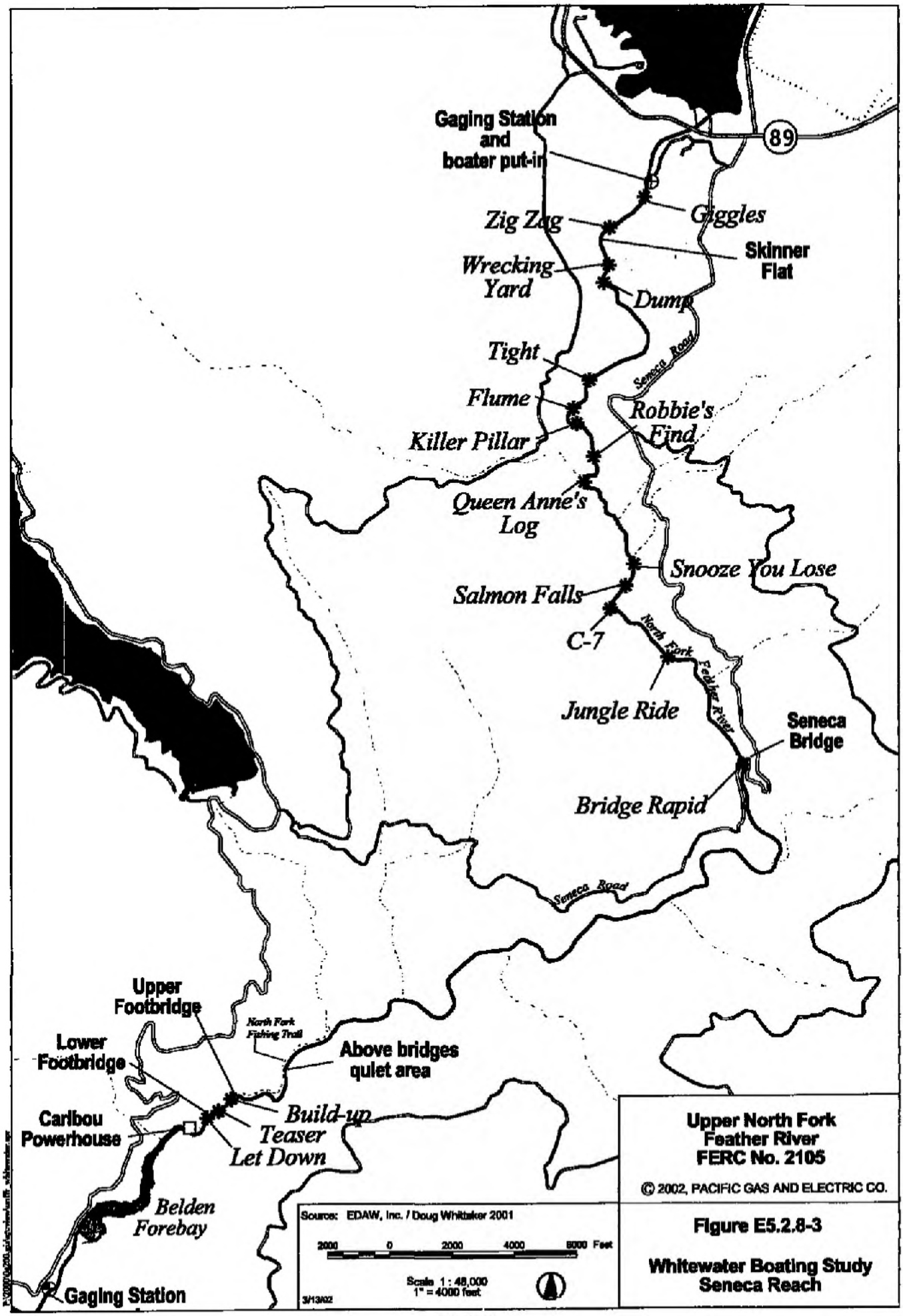
E5.2.8.3.1 Literature Review and Interviews with Resource Users/Experts

A review of relevant resource documents is an important first step in a flow assessment for recreation. This component included a review of relevant operation hydrology and resource descriptions and/or inventories developed for the Project or surrounding public lands. These materials helped identify recreational opportunities and flow issues related to recreation and described river hydrology.

Interviews with key resource experts or recreation users offered complementary information about recreational opportunities and hydrology. Interviews with users focused on how people recreate on the river, including where they go and when, and how they use the river. The goal was to understand the character of recreational opportunities and identify flow-dependent attributes. A second part of these interviews focused on the effects of flows on those attributes, specifically identifying flows that provide minimally acceptable or optimal, quality opportunities. Both Belden Reach and at least the upper part of Seneca Reach have been boated when dam maintenance or surplus reservoir inflow provided spill flows in the reaches. Reports of those trips helped with planning during the whitewater controlled flow study.

E5.2.8.3.2 Resource Reconnaissance and Photographic/Videotape Documentation

Resource reconnaissance was conducted in September/October 2000 and in May 2001. A preliminary reconnaissance was conducted in early September 2000 which focused specifically on Seneca Reach (which has greater access and logistical challenges, as well as less available information about historical boating use).



Using helicopter and road-accessible travel, this fieldwork helped determine whether the entire reach should be assessed during the controlled flow study; identified potential access options and videotape/photographic documentation locations; and provided improved information about organizing study logistics. Dave Steindorf (from American Whitewater [AW]), and Chico Paddleheads participated in the preliminary reconnaissance.

A second pre-study reconnaissance was conducted immediately prior to the whitewater controlled flow study which examined both Belden and Seneca Reaches. This reconnaissance involved road and trail reconnaissance. It was used to make final decisions about access and videotape/photographic locations, and to confirm initial planned flow releases for the controlled flow study. Bo Shelby and Doug Whittaker lead this reconnaissance effort; AW, Chico Paddleheads, Shasta Paddlers, EDAW, and Licensee representatives also participated.

Finally, study reconnaissance occurred as part of the controlled flow releases on the two reaches during both the whitewater and fishing components of the studies. For the whitewater study, on-river reconnaissance was conducted by Bo Shelby on Seneca Reach (using a kayak). On Belden Reach, on-river reconnaissance was conducted by Bo Shelby (in a kayak) and Doug Whittaker (in an inflatable kayak (one flow) or small cataraft (two higher flows).

Three main video stations were established on each of the reaches during the whitewater component. The objective was to capture video footage of boats traveling on the river at different flows as well as to document aesthetic or other recreational opportunity differences. The number and location of video stations are summarized in Appendix E5-R—Additional Results from Recreation Fishability Study.

E5.2.8.3.3 Controlled Flow Assessments

Controlled flow assessments, the central components of the study, are characterized by manipulation of the independent variable—flow. The idea was to release known quantities of water and then describe and evaluate conditions for various kinds of recreation. In this case, efforts focused on whitewater boating opportunities (using kayaks or other craft) fishing and other recreation.

E5.2.8.3.3.1 Whitewater Controlled Flow Assessment

The whitewater controlled flow assessment examined planned flow releases on both river reaches in September/October 2000. In addition to "base" fish flows provided in the reaches throughout the summer, the Licensee scheduled three boating releases on each of the two reaches. The amounts and dates of controlled releases in each reach are summarized in Table E5.2.8-1. Primary information from this component of the study was developed from surveys of assessment participants (e.g., whitewater boaters, anglers, and other river and reservoir recreation users), who answered questions before the study, after each flow, and after they had completed the full series of flows (see Appendix E5-N—Recreation Whitewater Survey Forms).

Table E5.2.8-1
Dates and Flows During the 2000 Whitewater Boating Controlled Flow Study

Date	Belden	Seneca
September 30	350	
October 1 (morning)	600	
October 1 (afternoon)	850	
October 2		210
October 3		410
October 4		325

Source: EDAW, Inc.

Focus group meetings were also conducted to capture qualitative information about flows and their effects on recreational opportunities. As discussed above, videotape/ photographic documentation was conducted to show how major rapids or other key river features changed at different flows.

Participants in the controlled flow assessment included boaters organized by AW, Chico Paddleheads, and/or Shasta Paddlers. There were up to 24 Belden Reach boaters (including consultants), although not all ran every flow. On Seneca Reach there were nine boaters, although one boater did not run the highest flow.

All participants signed liability waivers and took appropriate safety measures before entering on the river. Boaters on Seneca Reach were strong Class V boaters with commensurate self-rescue skills. AW/Chico Paddleheads/Shasta Paddlers developed a safety plan which provided additional details about safety responsibilities during the study.

E5.2.8.3.3.2 Fishability Controlled Flow Assessment

The fishability controlled flow assessment examined planned flow releases on both reaches in May 2001. Base flow levels were assessed by consultants during the pre-study reconnaissance. Higher flows were assessed by consultants and angling participants during planned releases determined largely by hydrology and fish habitat assessment studies. A schedule of flows assessed during the study is provided in Table E5.2.8-2.

Table E5.2.8-2
Dates and Flows During the 2001 Fishability Controlled Flow Study

Date	Belden	Seneca	Comments
May 11	100 cfs	35 cfs	Pre-study reconnaissance
May 12	700 cfs	700 cfs	
May 13	300 cfs	300 cfs	
May 14	300 cfs	100 cfs	
May 15	140 cfs	35 cfs	

Note: cfs=cubic feet per second

Source: EDAW, Inc.

Primary information from this component of the study was developed from surveys of anglers; these participants answered questions before the study, after looking at several locations during each flow, and after experiencing a full series of flows. The pre-study survey focused on fishing experiences and preferences. The on-site surveys focused on flow evaluations for different types of fishing at highly released flows.

The close-out survey focused on flow comparison evaluations, flow regime preferences, and other recreation management issues. Focus group meetings were also conducted to capture qualitative information about flows and their effects on recreation. As discussed above, videotape/photographic documentation was conducted in concert with the controlled flow assessment to show how features changed at different flows.

Participants in the controlled flow assessment included anglers contacted through California Trout, Inc. (Cal Trout) or other fishing advocacy organizations.

A total of 11 anglers participated in the study, although not all examined every reach at every flow or completed a close-out survey. In some cases, the close-out survey was completed after only viewing the 700 cfs flow; these had a considerable number of non-responses and were not used in the analysis. Additional information about the subsamples used for analyses is provided as results are presented.

In general, participants traveled as a group during the study, visiting pre-determined sites accessible from the road or by short hikes to or along the river. At each location, they typically fished briefly and then filled out short evaluation forms. At the end of the site visits, they participated in a short focus group meeting to discuss the advantages and disadvantages of each flow for various types of fishing or other activities.

All participants signed liability waivers and took appropriate safety measures before actually wading or fishing in the river.

E5.2.8.3.4 Wadeability Experiments

Some small-scale wadeability experiments were also conducted during the fishability controlled flow assessment. The goal was to assess anglers' preferences and tolerances for different wading depth and velocity combinations.

Participants waded into the river near Gansner Bar Campground, moving up and down the channel to find areas with different depths and velocities. At several locations, anglers were asked to rate the overall wadeability and then researchers measured the depth and velocity of the reach. The resulting database provides an initial understanding of anglers' depth/velocity preferences.

E5.2.8.3.5 Flow Requirements for Other Recreational Opportunities

Researchers also conducted preliminary flow evaluations for other opportunities, including: swimming, camping, and general river recreation. Swimming assessments focused on rough measurements of depths in pools near campgrounds and other likely swimming areas (Belden Reach only). General river recreation assessments focused on qualitative assessments of potential flow-related impacts on those opportunities, most of which are generally related to the aesthetic evaluations of different flows. However, other researchers are responsible for aesthetics issues in the study area; they have been provided with the video footage of different flows collected for this study.

E5.2.8.3.6 Whitewater Boating Opportunity Assessment

The study included a review and analysis of California whitewater guidebooks in an effort to assess the potential "uniqueness" and "importance" of potential boating opportunities on the two reaches. Interviews with experienced local whitewater boaters also contributed to this assessment, which compares opportunities on the UNFFR with other known whitewater runs in California. This task included descriptions of UNFFR runs, and summary tables of similar opportunities in the region.

It also included rough estimates of potential use levels on Belden and Seneca Reaches based on interviews with local boaters and on professional judgments.

E5.2.8.3.7 Whitewater Boating Valuation Literature Review

A literature review was also conducted to provide rough estimates of the economic value of whitewater boating. This review focused on publications that have collected empirical data about boating value, using travel cost and contingent valuation methods. It was proposed as a preliminary tool to estimate of the value of whitewater boating; a more detailed economic valuation study of whitewater boating specific to the Project area would require a significantly greater investment of time and resources. However, this review provided a rough estimate of economic value or "consumer surplus" from whitewater activities.

E5.2.8.3.8 Integrating Information about Flows and Recreation

The final task was to integrate information from the variety of sources and discuss the trade-offs of providing different flow regimes. Information in this section was organized to be integrated with similar information about fish and aquatic biological resources in Project river reaches and Lake Almanor, reservoir level effects on recreation, and hydropower impacts.

E5.2.8.3.9 Opportunities for Public Comment

Public comments were solicited at several stages during the study. Interested users were asked to comment on the study plans for both the whitewater and fishability assessments.

Some river users and/or other stakeholders were interviewed during the controlled flow assessments or on the phone throughout the study. This draft report is scheduled to be released to the public for a month-long review period. The final report will include public comments and agency/consultant responses.

E5.2.8.3.10 Study Schedule

The study began in September 2000 and was completed one year later. Dates of major elements/steps in the study are provided in Table E5.2.8-3.

Table E5.2.8-3
Study Schedule

Study	Timeframe
Preliminary whitewater reconnaissance visit	September 6, 2000
Whitewater boating pre-study reconnaissance	September 29, 2000
Whitewater boating controlled flow study	September 29–October 5, 2000
Whitewater boating controlled flow analysis	January–June 2001
Boating opportunity assessment	January–June 2001
Boating valuation literature review	January–June 2001
Fishing pre-study reconnaissance	May 2001
Fishing controlled flow study	May 2001
Fishing controlled flow analysis	June–September 2001
Draft report	October 31, 2001
Report comments	November 30, 2001
Final study report	December 31, 2001

Source: EDAW, Inc.

E5.2.8.4 Results and Discussion

E5.2.8.4.1 Whitewater Boating

This section describes findings associated with whitewater boating opportunities. It begins with findings from the two controlled flow assessments and the associated surveys, focus groups, and reconnaissance.

Following this, it presents summaries of information from the regional whitewater assessment and a literature review of the economic value of whitewater boating.

E5.2.8.4.1.1 Belden Reach Results

This section describes results from the controlled flow study on Belden Reach (September 30 to October 1, 2001). Boaters ran the river at approximately 350, 600, and 850 cfs. Results include data from 24 "panelists," although not all participants experienced each flow or completed all sections of the surveys. Results for subgroups of panelists have been presented if there were important differences between them and the overall panel.

Profile of the Panel

Age. The panel participants ranged in age from 18 to 52, with an average age of 40. Only three people on the panel were under 30.

Gender. The panel had more males (16) than females (8).

Typical Craft. Most (21 of 24) panel members were kayakers, with the remaining three reporting their usual craft as rafts or catarafts. One kayaker noted that he usually used a decked canoe (C-2), while another noted that he used many different types of craft.

Skill Levels. Most of the panel had relatively high skill levels. Fifty percent reported that they were expert boaters (Class V), and another 33 percent were advanced boaters (Class IV) or a combination of the two (Class IV/V).

However, there were also three respondents (13 percent) who identified themselves as intermediate boaters (Class III), and a fourth reported intermediate skills when paddling an inflatable kayak at a 350 cfs flow. For some questions, comparisons were made between advanced/expert boaters and the intermediate boaters.

Years Boating. The panel participants have considerable experience boating; the average number of years of experience was 13.9 years. About 80 percent have been boating more than seven years, and about 30 percent have been boating for more than 20 years. There were three boaters who have been boating 3 years or less.

Frequency of Boating. Most of the panel participants boat several times each year. Half of them boat more than 42 days per year; the average number of days was 58. Four boaters reported boating over 100 days per year.

River-Running Preferences. Panel participants were asked to agree or disagree (on a 7-point scale, with a "no opinion" mid-point) with 10 statements about river-running preferences. Responses helped characterize the panel's boating interests and offered potential explanations for variations in other responses during the study.

A summary of responses to the statements listed below is given in Figure E5.2.8-4—Panel Responses to River-Running Preference Items.

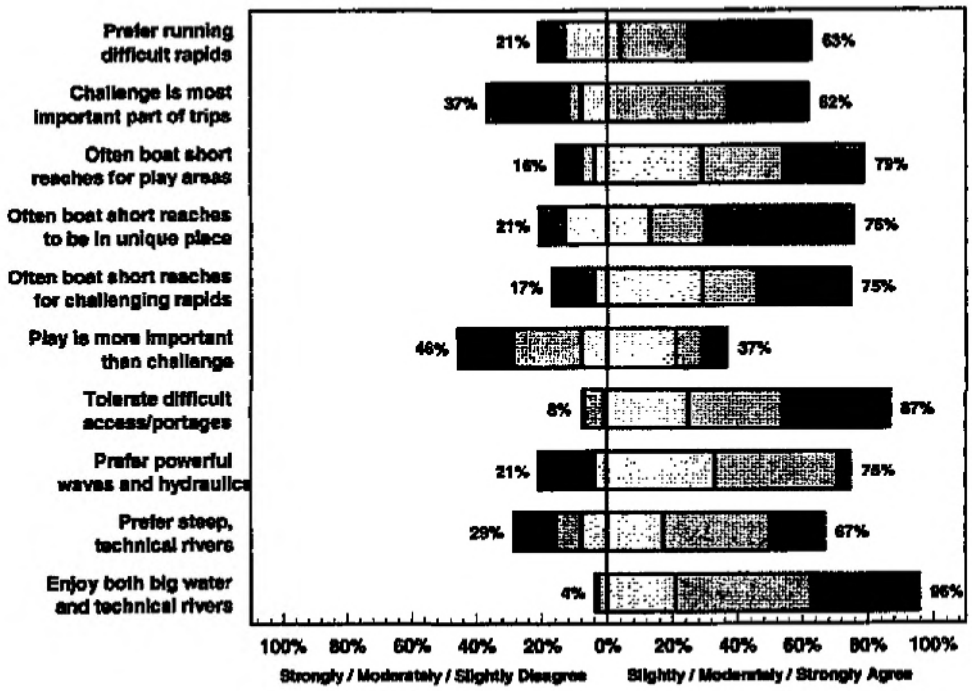


Figure E5.2.8-4
Panel Responses to River-Running Preference Items

Verbatim river-running preference items:

- I prefer running rivers with difficult rapids (Class IV and V);
- Running challenging whitewater is the most important part of my boating trips;
- I often boat short river segments (under 4 miles) to take advantage of whitewater play areas;
- I often boat short river segments to experience a unique and interesting place;
- I often boat short river segments to run challenging rapids;

- Good whitewater play areas are more important than challenging rapids;
- I am willing to tolerate difficult put-ins and portages in order to run interesting reaches of whitewater;
- I prefer boating rivers that feature large waves and powerful hydraulics;
- I prefer boating steep, technical rivers; and
- I enjoy boating both technical and big water rivers.

The results listed below suggest several conclusions about the panel as a whole:

- Over 75 percent of the participants were interested in boating short river segments, particularly if they offer opportunities to explore unique or interesting places. A similar majority also noted interest in boating short segments for challenging rapids or play areas, but fewer reported strongly agreeing with these items.
- Nearly 90 percent of the participants reported willingness to tolerate difficult access or portages in order to run interesting whitewater.
- Overall, it appears that the panel as a whole is slightly more interested in challenging rapids compared to whitewater play areas (places to execute rodeo or freestyle maneuvers), although about a third were interested in whitewater play. Two subgroups were created to represent "avid playboaters" (n=9; if they agreed that they boat short segments to reach play areas and agreed that play areas are more important than challenging rapids) or "non-playboaters" (n= 4; if they do not boat short segments to reach play areas).

Eleven panelists did not fit in either group (showed moderate interest in playboating); the names of the boaters in each group are given in Appendix E5-P—Recreation Controlled Flow Study Participants.

- Most (96 percent) of the panelists seemed interested in both "creek boating" (smaller, technical streams) and "big water" boating (stronger hydraulics and larger waves), although about a quarter were created to some extent prefer one or the other. Two subgroups were created to represent creek boaters (n=7; if they were more likely to prefer creeks to big water) or big water boaters (n=7; if they were more likely to prefer big water to creek boating). Ten boaters did not fit in either category (they rated creek and big water boating equally). The names of boaters in each subgroup are provided in Appendix E5-P.
- The panel as a whole is very interested in challenging rapids, with about 60 percent agreeing that they prefer to run Class IV and V rivers, and that challenge is the most important aspect of their trips. Two subgroups were created to represent boaters who are clearly "challenge oriented" (n=16; they agree that they prefer Class IV/V rapids and that challenge is the most important aspect of their trips) or "challenge neutral" (n=4; they don't prefer Class IV/V rapids and do not think challenge is most important).

  Eight boaters did not fit in either category (had only moderate interest in challenging rapids).

General Description of Flows

Based on general comments made at focus group meetings, the information below describes run types based on controlled flow levels. Appendix E5-Q—Additional Results from Recreation Whitewater Study includes paraphrased comments from boaters collected at focus group meetings.

350 cfs. This was the initial flow and offered an opportunity to scout and run the river with lower safety risks. Pre-study scouting suggested there might be two to three areas where split channels led down to river-wide sweepers or other vegetation obstacles. All boaters were able to run the river without significant problems, although two kayakers portaged the narrow split channel chute known as "Bramble" because of overhanging vegetation. The first boating group also had to conduct one extended scout (one kayaker got out of the river while the rest stayed in their boats) so they could choose the appropriate side of the channel to run. In general, this lower flow provided "bony" conditions with most boaters experiencing multiple hits (the average was about 70 hits per person).

600 cfs. This flow offered many more route options and less contact with rocks or side vegetation. Boaters knew which channels to take, so they did not have to be as cautious about eddy hopping above every blind corner or steep gradient.

Two kayakers portaged Bramble Chute, but all the other kayakers ran the stream without difficulty. A small paddle rafter also ran the river without incident, although there was frequent contact with rocks in the channel and overhanging vegetation.

The small cataraft (with oars) boater put-in below Bramble Chute to avoid running it due to its limited oar space, but otherwise negotiated the reach with few problems.

850 cfs. The highest flow in the study had considerable power compared to the other two flows. Two intermediate boaters chose not to run this flow, but the rest of the kayakers and rafters made the run without incident. The paddle rafter ran the entire reach, while the catarafter put-in below Bramble Chute. The flow featured nearly continuous whitewater with strong hydraulics in the steeper drops, with virtually no boatability problems (hits or stops).

Post-Run Preferred Flows

After each run, boaters were asked to indicate their preferences for similar, higher, or lower flow levels (see Table E5.2.8-4). All participants considered 350 cfs too low; a majority felt 600 cfs was also too low. The 850 cfs flow, by contrast, was preferred by a majority of boaters, and those who did not prefer it were roughly split as to whether the flow was too high or too low.

Table E5.2.8-4
Post-Run Preferences for Flow Levels

Boater Response (percent)	350 cfs	600 cfs	850 cfs
Prefer much higher	58	0	5
Prefer higher	42	65	18
Prefer the same	0	30	65
Prefer lower	0	5	20
Prefer much lower	0	0	0

Source: EDAW, Inc.

Post-Run Likelihood of Return

Boaters were also asked whether they would be likely to return to experience the flow levels they just ran (see Table E5.2.8-5). Results suggest that both the 600 and 850 cfs flows are likely ("probably" and "definitely" responses) to attract return visits from a majority of boaters, but that the 850 cfs flow is slightly more likely to elicit the "definitely" response. About one-quarter of the participants indicated that they are unlikely to return at any flow, suggesting that the river did not provide an outstanding resource for all panelists.

Table E5.2.8-5
Post-Run Likelihood of Return at Various Flows

Boater Response (percent)	350 cfs	600 cfs	850 cfs
Not return	5	5	5
Possibly return	37	24	20
Probably return	21	19	15
Definitely return	37	52	60

Source: EDAW, Inc.

Close-Out Evaluations

Importance of Attributes. Boaters were asked to rate the importance of 10 potential attributes of whitewater trips on a 5-point scale (1=not important to 5=extremely important).

Frequency distributions for each are given in Figure E5.2.8-5—Importance of Trip Attributes on Belden Reach (with "not," "slightly," and "moderately important" responses on the left side of the central axis, and "very" and "extremely important" responses on the right).

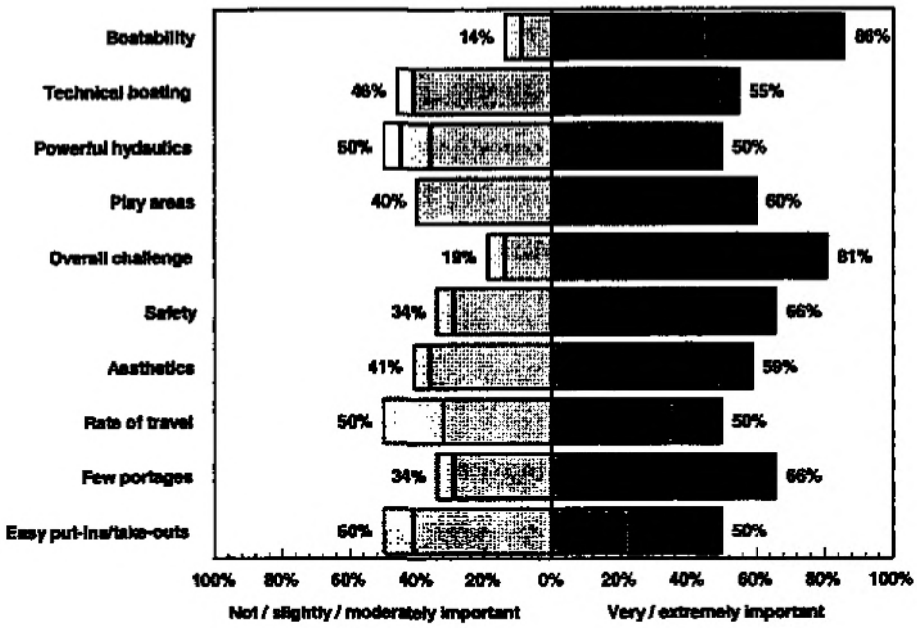


Figure E5.2.8-5
Importance of Trip Attributes on Belden Reach

Results suggest that boatability, the overall challenge of whitewater, and the infrequency of portages are the most important attributes of Belden trips, although at least half of the boaters reported that every attribute was either very or extremely important.

Relatively less important attributes were the availability of easy put-ins and take-outs, a good rate of travel, and powerful hydraulics. Results appear to reflect the character of the river: even gradient, active, creek boating, rather than a river with large hydraulics or numerous play areas.

Close-Out vs. Post-Run Evaluations. Boaters were asked to rate a series of 12 flows on Belden Reach from 250 cfs to 1,600 cfs on the 7-point acceptability scale described earlier. Results are given in Figure E5.2.8-6—Post-Run and Close-Out Evaluations of Flow Levels on Belden Reach, with post-run evaluations for the three flows also shown for comparison purposes (post-run results are provided in Appendix E5-Q).

Close-out results show a classic "flow evaluation curve" with a bell shape. Flows below about 500 cfs are rated unacceptable, they improve to nearly optimal levels around 700 cfs, and become optimal at about 850 cfs, before declining steadily until about 1,200 cfs (although they remain in the acceptable range through 1,600 cfs). Based on these data, optimum flows are about 850 cfs, but any flow above about 500 cfs is acceptable.

Differences between the post-run and close-out results are significant from 350 to 600 cfs, with post-run flows rated more acceptable than those same flows when considered after running all three levels. At the 850 cfs level, differences were smaller, but post-run evaluations were slightly lower than close-out evaluations. In both cases, however, ratings show that 850 cfs was rated better than lower flows.

The post-run/close-out differences are consistent with other controlled flow study results, and may be explained by two factors. First, people may rate initial trips on a river higher because they provide first exposure to a new environment; on subsequent trips, some of the novelty may wear off.

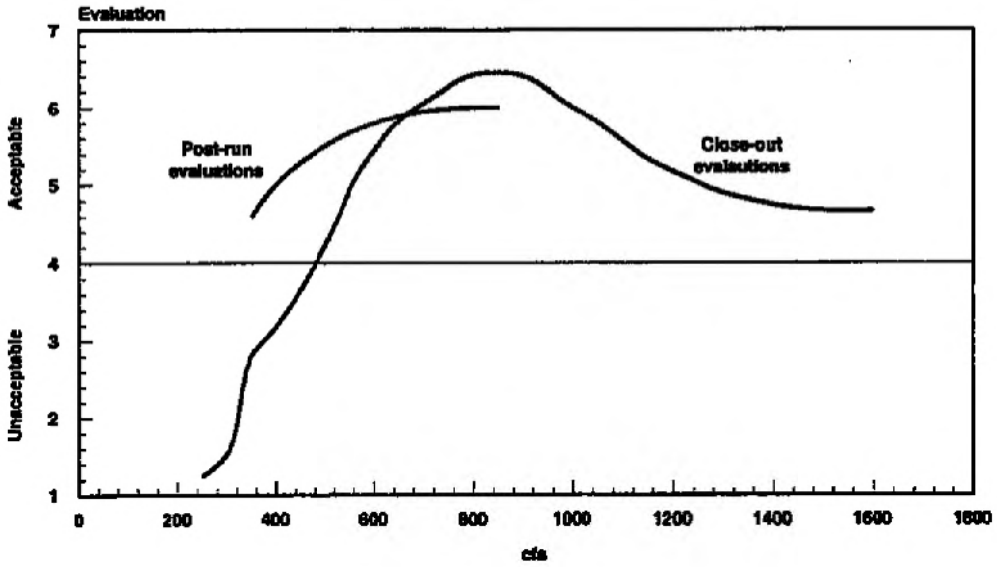


Figure E5.2.8-6
Post-Run and Close-Out Evaluations of Flow Levels on Belden Reach (All Boaters)

Similarly, initial trips may have higher ratings because they involve more route-finding challenges; subsequent trips would require less of this and thus diminish the need for awareness that can heighten experiences. Second, it is more difficult to evaluate initial runs because there are no comparisons with other flows yet; 350 cfs may have appeared acceptable as a stand-alone run because it was at least boatable. However, once boaters have had fewer boatability problems at the higher flows, the 350 cfs level may have seemed to pale by comparison. Accordingly, more weight is placed on the close-out results, which offer people the full set of flows for comparison purposes.

Figure E5.2.8-7—Close-Out Flow Evaluations for Rafters and Kayakers (and all Boaters), shows close-out evaluations for kayakers and rafters (as well as all boaters), to highlight differences between those two groups.

Although the shape of the curves were similar, and the peak for both was at about 850 cfs, rafting evaluations were lower throughout the range and they did not become acceptable until about 600 cfs. This is consistent with focus group results presented earlier, suggesting that 350 cfs would involve many boatability problems and probably could not be run in a raft.

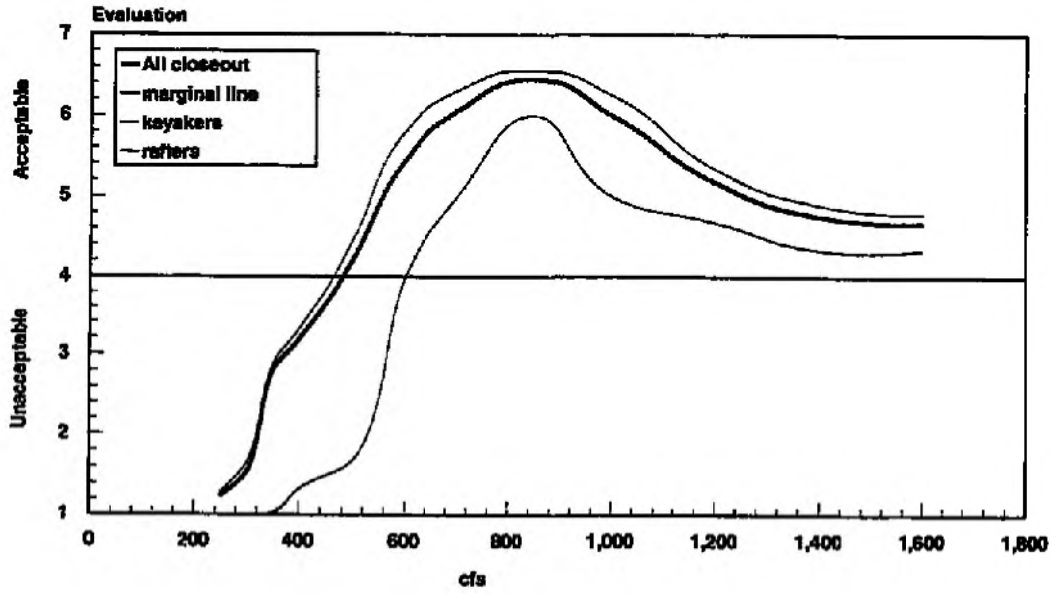


Figure E5.2.8-7
Close-Out Flow Evaluations for Rafters and Kayakers (and all Boaters)

Specified Flows. In the close-out survey, boaters were also asked a series of "specified flow" questions asking them to identify flows or ranges that provide a variety of different opportunities. The specific questions are summarized below. Table E5.2.8-6 shows the mean and median responses, the "inter-quartile range" (defined by the 25 and 75 percentile responses, suggesting the variation of responses after eliminating outliers), the lowest and highest responses, and the standard error of the mean (another indicator of the variation of responses).

Table E5.2.8-6
Descriptive Statistics for "Specified Flow" Questions for all Boaters

	Mean	Median	25 percent	75 percent	Low	High	Standard Error Mean
Lowest flow to use for transport	360	350	300	450	150	600	28.0
Lowest for standard	536	500	438	600	300	850	32.3
Low end of standard range	608	600	513	688	400	800	26.2
High end of standard range	835	830	700	1,000	600	1,000	31.4
Lowest for high challenge	797	850	750	850	450	1,000	30.8
Low end of challenge range	832	850	800	850	650	1,200	27.5
High end of challenge range	1,353	1,350	1,000	1,575	900	2,000	88.0
Highest safe flow	1,377	1,200	975	1,700	700	2,500	117.2
If only one flow...	771	850	650	850	500	1,000	34.6
Lowest if only two flows...	655	600	600	700	500	1,000	29.2
Highest if only two flows...	902	900	800	950	550	1,600	49.58

Source: EDAW, Inc.

Results suggest several important findings, as discussed below. For simplicity purposes, medians are used to summarize central tendencies in these results, while inter-quartile ranges around the mean are used to discuss variation.

- Boaters identified flows around the lowest in the study (350 cfs) as a minimum to use the river for transportation, but recognized that quality "standard trips" are not provided until flows are above about 500 cfs, and that an optimal range for "standard trips" is from about 600 to 830 cfs.
- While one kayaker suggested the river could be run as low as 150 cfs, most boaters specified minimum boatable flows between 300 and 450 cfs.

  For the low end of the "standard trip," most boaters specified flows between about 430 and 600 cfs (the inter-quartile range).

- Boaters appear to recognize differences between "standard" trips and "high challenge" trips, when flows reach around 830 to 850 cfs, defining the transition between these two opportunities. Based on inter-quartile results, the transition for some boaters might be as low as 700 cfs, but it is unlikely to be higher than 1,000 cfs even for the most skilled boaters.
- Boaters identified an optimal range for high challenges from about 850 to 1,350 cfs; the high end of this range is similar to the flow boaters used to identify the "highest safe flow" (1,200 cfs).

Specified flow questions:

- Think of the river as a waterway used for transportation. What is the lowest flow you need to simply get down the river in your craft?

Many people are interested in a "standard" whitewater trip at medium flows. Think of this "standard trip" for strong intermediate to advanced boaters using your craft.

- What is the lowest flow that provides a quality experience for this type of trip?
- What is the best or optimal range of flows for this type of trip?

Some people are interested in taking trips at higher flows with more challenging whitewater. Think of this "high challenge trip" for advanced or expert boaters using your craft.

- What is the lowest flow that provides a quality experience for this type of trip?
- What is the best or optimal range of flows for this type of trip?

- What is the highest safe flow for your craft and skill level?
- If the Licensee released only one flow for boating, what flow would you prefer? If the Licensee released two flow levels that offer different types of boating experiences, what two flows would you prefer?

There was greater variation in responses for the high end of the challenge range and the highest safe flow (inter-quartile ranges were 575 and 725, respectively), compared with ranges for other questions (always less than 300 and usually less than 200 cfs). The probable explanation is differences in skill levels among respondents. Focus group discussion included mention of the fact that flows above 850 cfs featured fewer eddies for recoveries between rapids for less skilled boaters, while higher skilled boaters were less worried about their need for such recovery areas.

There was some variation in choosing a single flow release for whitewater boating (if only one could be provided), with the median at 850 cfs, but with an inter-quartile range of 650 to 850 cfs.

When offered a choice of two flows, the median responses were 600 and 900. Inter-quartile ranges suggested similar findings, but recognized that some boaters would prefer slightly higher flows for the two releases (with ranges between 600 and 700 cfs, and between 800 and 950 cfs).

Integrating Overall and Specified Flows. Figure E5.2.8-8—Overall Flow Evaluation Curve and Mean Specified Flows for all Boaters, overlays close-out results for the overall flow evaluation curve, and optimal flow ranges for different opportunities, based on median specified flow results for all boaters. Results show that the overall curve peaks at the transition between standard and high challenge trips, when flows are in both optimal ranges. Results also show that the technical range (defined by the minimum flow to use the river for transportation and the lowest flow that provides quality standard trips) encompasses the flow when the overall curve crosses the marginal line.

Finally, results suggest that boaters specified a best single flow at the peak of the curve, and the two best flows at the lower ends of the ranges for both standard and high challenge trips.

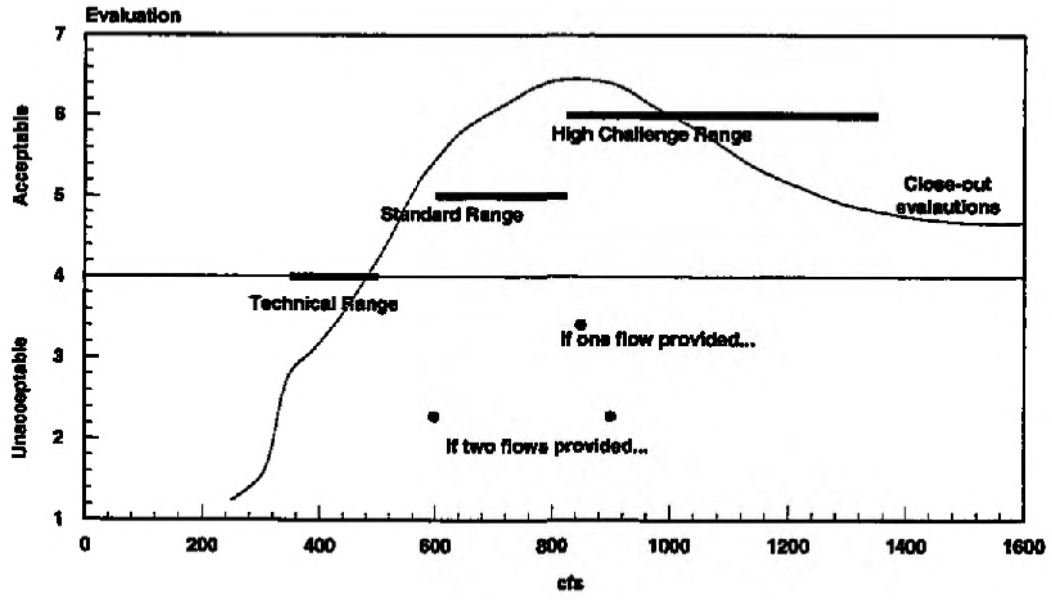
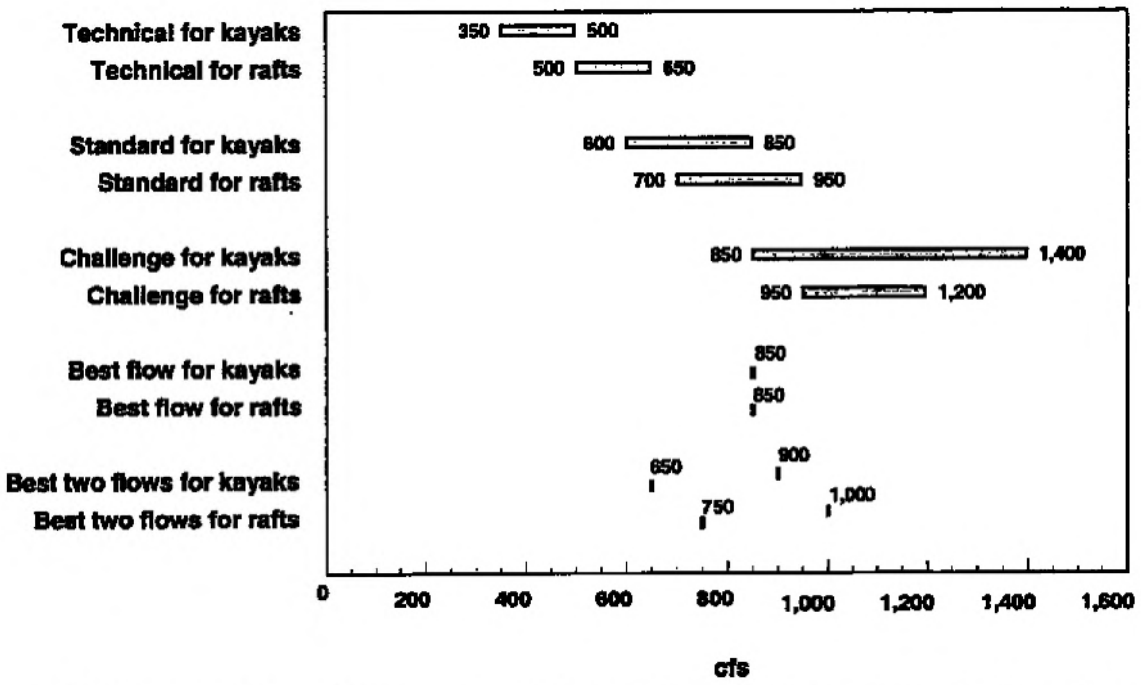


Figure E5.2.8-8
Overall Flow Evaluation Curve and Mean Specified Flows for all Boaters

Differences for rafters and kayakers for key specified flows (optimum ranges and best single or two flows) are shown in Figure E5.2.8-9—Rafting and Kayaking Flow Ranges on Belden Reach, offering slightly more detailed information about flow requirements for different craft. Results follow from overall flow evaluations, suggesting that rafts require more water to get down the river (500 to 650 cfs compared to 350 to 500 cfs for kayaks) and to provide high quality trips. However, results also show that differences between rafts and kayaks narrow for standard and high challenge trips.



Note: Data based on median specified flows. Technical acceptable range is from minimum boatable to minimum standard flow (no optimum range).

Figure E5.2.8-9
Rafting and Kayaking Flow Ranges

Integrating Belden Reach Whitewater Boating Information

Taking all the information about whitewater boating on Belden Reach together, findings suggest that while boating can begin as low as 300 to 400 cfs (around the first flow tested, 350 cfs), higher flows from about 600 to 1,400 cfs are required to provide quality whitewater boating opportunities. Within this higher range, 600 cfs is identified as a starting point for quality kayaking opportunities, but that flow is below optimal levels for rafting. From 700 to about 850 cfs, quality standard trips for both kayaking and rafting are likely to be provided, while flows above 850 cfs provide the more powerful hydraulics and smaller recovery areas associated with challenging opportunities. Although boaters did not experience higher flows than 850 cfs during the study, they collectively estimated that flows above about 1,200 to 1,400 cfs are probably too high for this reach, depending upon one's skill level and craft.

Assuming that the goal is to minimize lost generation capacity while providing recreational opportunities, it is possible to identify key threshold flows that would provide for different opportunities. If a single release is contemplated to provide quality standard opportunities for kayaking, flows around 600 cfs would suffice. However, if the goal was to provide quality standard kayaking and rafting opportunities, a flow around 750 cfs is appropriate; this is in the middle of the optimal ranges for both craft. If the goal was to provide a single flow that also attempts to provide some higher challenge boating (along with standard opportunities) for both types of craft, a flow about 850 cfs is needed (although some highly-skilled boaters would prefer slightly higher flows).

If diversity of opportunities is possible via two distinct releases (on adjacent days of a weekend, for example), decisions need to be made about the types of opportunities to be provided. If the focus is on providing standard and high challenge kayaking, then a reasonable combination is 600 and 850 cfs, the two higher flows experienced by boaters during the study. If the goal is to provide both standard and high challenge rafting along with kayaking, the combination should probably be slightly higher (about 700 and 900 cfs).

Under any release scenario, a recurring complaint among boaters related to the thick bramble and blackberry vegetation along the river which limits access to eddies, the shore, or other recovery areas in case of a mishap. This vegetation likely exists because of the absence of periodic flooding, and any opportunities to decrease or remove it could dramatically improve safety options for boaters. If vegetation were removed, route options might also change and thus alter evaluations of different flows. All results in the preceding section, however, refer to the river and riparian areas as they currently exist.

E5.2.8.4.1.2 Seneca Reach Results

This section describes results from the controlled flow assessment on Seneca Reach (October 2–4, 2001). Boaters ran the river at approximately 210, 325, and 410 cfs. Results include data from nine panelists, although one participant did not run the highest flow.

Profile of the Panel

Age. The panel ranged in age from 19 to 52, with an average age of 33. Five of the nine panelists were under age 30.

Gender. The panel consisted of males (8) and one female.

Typical Craft. All boaters in the panel use hard shell kayaks.

Skill Levels. All boaters had very high skill levels; eight of the nine (89 percent) reported they were expert boaters (Class V), and the other boater reported being advanced.

Years Boating. The panel had considerable experience boating; the average number of years of experience was 12.4. About 66 percent of the participants have been boating more than 10 years, and about 22 percent have been boating more than 20 years.

Frequency of Boating. Most of the participants boat many times per year. The average number of days boating per year was 128; the median number was 100. Three boaters reported boating over 200 days per year. The lowest number reported was 25; the highest was 300.

River-Running Preferences. The panel was asked to agree or disagree (on a 7-point scale with a "no opinion" mid-point) with ten statements about river-running preferences.

Responses helped characterize participants' boating interests and offered potential explanations for variations in other responses during the study. A summary of responses to each of the statements listed below is provided in Figure E5.2.8-10—Panel Responses to River-Running Preference Items (Seneca Reach).

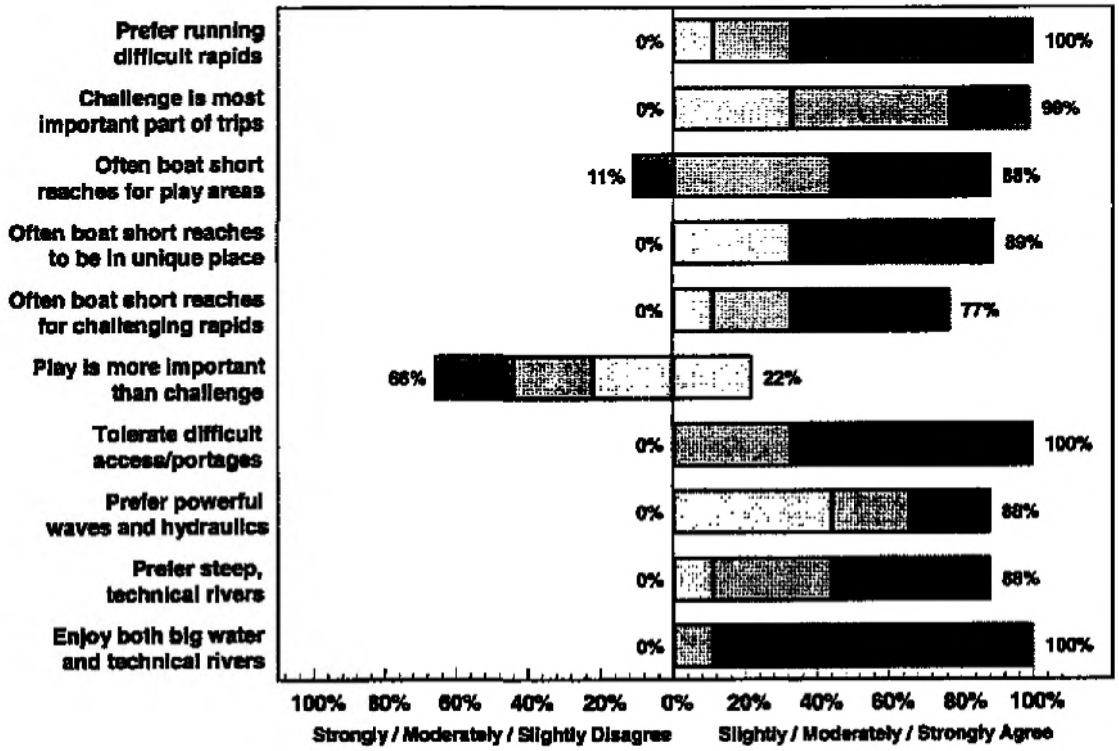


Figure E5.2.8-10
Panel Responses to River-Running Preference Items (Seneca Reach)

Verbatim river-running preference items:

- I prefer running rivers with difficult rapids (Class IV and V);
- Running challenging whitewater is the most important part of my boating trips;
- I often boat short river segments (under 4 miles) to take advantage of whitewater play areas;

- I often boat short river segments to experience a unique and interesting place;
- I often boat short river segments to run challenging rapids;
- Good whitewater play areas are more important than challenging rapids;
- I am willing to tolerate difficult put-ins and portages in order to run interesting reaches of whitewater;
- I prefer boating rivers that feature large waves and powerful hydraulics;
- I prefer boating steep, technical rivers; and
- I enjoy boating both technical and big water rivers.

The results listed below suggest several conclusions about the panel as a whole.

- Overall, it appears that the panel is highly interested in challenging and difficult rapids, although there is less agreement among panelists that challenge is the most important part of their trip.
- Nearly every boater showed some interest in boating short river segments, particularly if they offer opportunities to explore unique or interesting places. A majority also noted their interest in boating short segments for challenging rapids or play areas, but fewer reported strongly agreeing with these statements.
- All boaters reported a willingness to tolerate difficult access or portages to run interesting whitewater.
- The panel appears to have a slightly greater interest in steep, technical, "creek boating" than in the large hydraulics and waves associated with big water boating.

- When given the opportunity, however, most participants strongly agreed that they liked both types of whitewater.
- The panel as a whole was more interested in challenging rapids and a variety of whitewater conditions than Belden Reach panelists were, who showed slightly less diverse interests.

General Description of Flows

210 cfs. This flow was the first and lowest in the study and offered a very technical opportunity. Although it allowed boaters greater time to assess routes as they made their way down the river, contact with rocks occurred throughout the run and there were limited route options. Some of the rocks also presented some pinning hazards (see the discussion of boatability problems in Appendix E5-Q).

325 cfs. This median flow was boated on the third day (after 410 cfs) in an effort to gain more information about flows between 210 and 410 cfs. Boaters generally experienced this flow as if it were 210 rather than 410 cfs. It generally offered limited route options (like 210 cfs), but was also more "pushy." However, it did not appear to offer the stronger hydraulics characteristic of the higher 410 cfs flow, and it had more congested eddies and routes (with rocks and logs) than the higher flow.

410 cfs. This was the highest flow during the study, and participants agreed that it offered the best run. The river was "pushier," but still had adequate eddies for scouting rapids.

This flow offered more play and more route options, with mid-channel rocks and logs less likely to cause boatability or challenge hazards. However, panelists agreed that the speed of this flow was higher, and that users should probably know the locations of, and lines through, major rapids before attempting this flow (or go with boaters who know them). This flow may be a little too high to be considered an entry flow.

Post-Run Preferred Flows

After each run, boaters were asked to indicate their preferences for similar, higher, or lower flow levels (see Table E5.2.8-7). Results clearly indicate that boaters would prefer higher flows than 210 and 325 cfs, while a majority would prefer the 410 cfs flow or slightly higher.

Table E5.2.8-7
Post-Run Preferences for Flow Levels

Boater Response (percent)	210 cfs	325 cfs	410 cfs
Prefer much higher	56	33	0
Prefer higher	44	67	25
Prefer the same	0	0	75
Prefer lower	0	0	0
Prefer much lower	0	0	0

Source: EDAW, Inc.

Post-Run Likelihood of Return

Boaters were also asked whether they would likely return to experience at the flow levels they had just run (see Table E5.2.8-8). Results suggest that both the 325 and 410 cfs flows are likely to attract return visits from all boaters ("probably" and "definitely" responses), but that the 410 cfs flow was considered much better (78 percent said that they would definitely return at that level).

In distinct contrast, only 44 percent said they would definitely or probably return at the 210 cfs level.

Table E5.2.8-8
Post-Run Likelihood of Returning at Various Flows

Boater Response (percent)	210 cfs	325 cfs	410 cfs
Not return	0	0	0
Possibly return	56	11	0
Probably return	33	78	38
Definitely return	11	11	63

Source: EDAW, Inc.

Close-Out Evaluations

Importance of Attributes. Boaters were asked to rate the importance of 10 potential attributes of whitewater trips on a 5-point scale (1=not important to 5=extremely important). Frequency distributions for each are given in Figure E5.2.8-11—Importance of Trip Attributes on Seneca Reach (with "not," "slightly," and "moderately important" responses on the left side of the central axis, and "very" and "extremely important" responses on the right).

Results suggest that the most important attributes of Seneca Reach included: the overall challenge of whitewater boating, its safety, and the quality of technical boating. Boatability, aesthetics, rate of travel, and few portages were also important to panelists. Relatively less important attributes included: the availability of easy put-ins and take-outs, powerful hydraulics, and the quality of whitewater play areas.

Results appear to reflect the character of the river, which offers steep, technical creek boating rather than large hydraulics or numerous play areas.

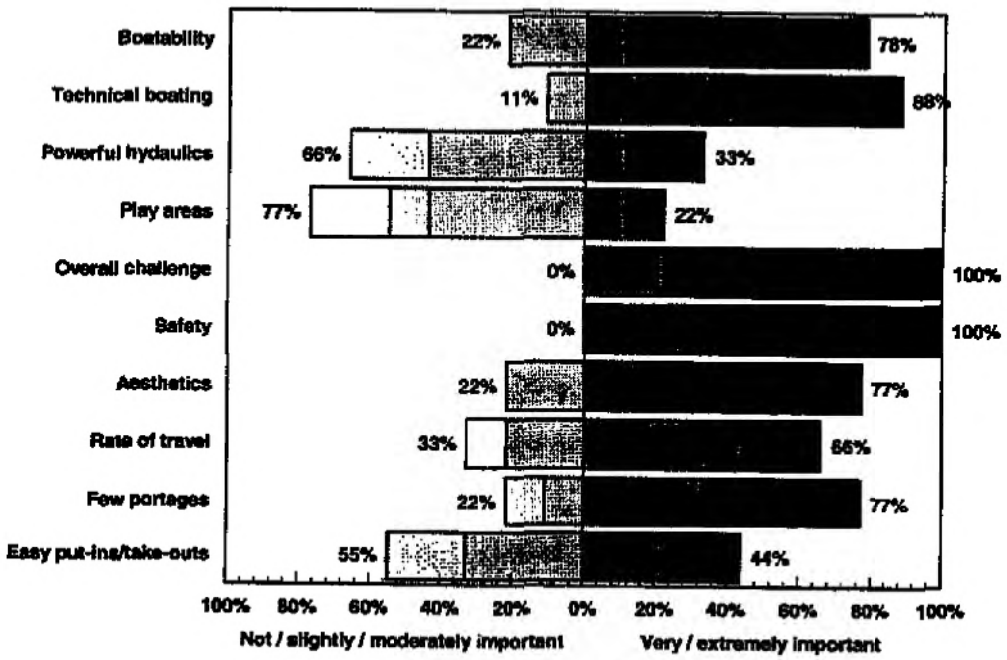


Figure E5.2.8-11
Importance of Trip Attributes on Seneca Reach

Close-Out vs. Post-Run Evaluations. Boaters were asked to rate a series of 12 flows on Seneca Reach from 100 cfs to 700 cfs on a 7-point acceptability scale (described earlier). Results are given in Figure E5.2.8-12—Post-Run and Close-Out Evaluations on Seneca Reach, with post-run evaluations for the three flows also shown for comparison purposes. Close-out evaluation results show a classic "flow evaluation curve" with a bell shape. Flows below about 300 cfs were rated unacceptable, they improved to nearly optimal levels at around 400 cfs, and became optimal at about 450 cfs, then declined toward marginal levels at about 700 cfs. Based on these data, optimum flows are about 450 cfs, but any flow above about 300 cfs is considered acceptable.

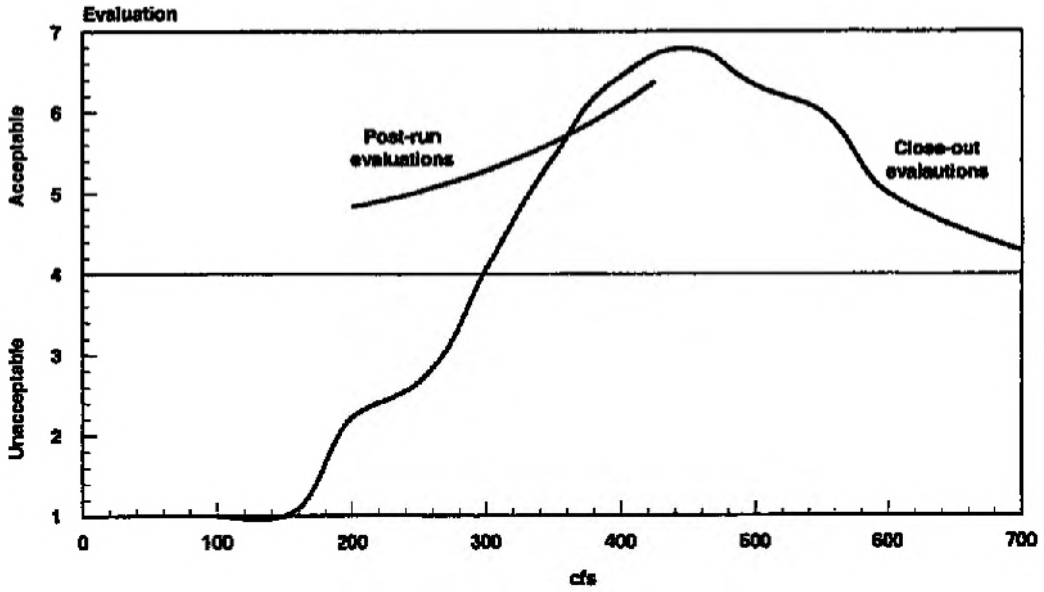


Figure E5.2.8-12
Post-Run and Close-Out Evaluations on Seneca Reach

Differences between the post-run and close-out results were significant at the 210 cfs level, with post-run flows rated more acceptable than that same flow when considered during the close-out. At 325 and 410 cfs, differences were smaller, although post-run evaluations were slightly lower at 410 cfs than during the close-out evaluations.

The post-run/close-out differences at 210 cfs are consistent with other controlled flow study results, and may be explained by two factors. First, people may rate the initial trip on a river more positively because it provides the first exposure to a new environment; on subsequent trips, some of the novelty may wear off. Similarly, initial trips may have higher ratings because they involve more route-finding challenges; subsequent trips would require less of this and thus diminish the need for awareness which can heighten experiences.

Second, it is more difficult to evaluate initial runs because there are no comparisons with other flows yet; 210 cfs may have appeared acceptable as a stand-alone run because it was at least boatable. However, once boaters have experienced higher flows, the 210 cfs pales by comparison. Accordingly, more weight is placed on close-out results, which include the full set of flows for comparison purposes.

Specified Flows. In the close-out survey, panelists were also asked a series of "specified flow" questions prompting them to identify flows or ranges that provide a variety of different opportunities. The specific questions are summarized below. Table E5.2.8-9 shows the mean and median responses, the "inter-quartile range" (defined by the 25 and 75 percentile responses, suggesting the variation of responses after eliminating outliers), the lowest and highest responses, and the standard error of the mean, another indicator of the variation of responses.

Table E5.2.8-9
Descriptive Statistics for "Specified Flow" Questions for Boaters on Seneca Reach

	Mean	Median	25 percent	75 percent	Low	High	Standard Error Mean
Lowest flow to use for transport	239	250	200	275	200	300	13.9
Lowest for standard	328	325	300	363	300	375	11
Low end of standard range	353	363	306	400	275	400	17.3
High end of standard range	494	525	400	487	350	600	34.6
Lowest for high challenge	450	450	400	500	400	500	16.4
Low end of challenge range	431	400	375	500	325	550	24.9
High end of challenge range	669	650	575	750	425	1,000	54.3
Highest safe flow	627	700	525	700	400	800	41.7
If only one flow...	467	500	425	500	350	550	20.4
Lowest if only two flows...	369	375	350	400	300	400	11.6
Highest if only two flows...	542	550	488	600	400	700	30.5

Source: EDAW, Inc.

Results suggest several important findings, as discussed below. For simplicity purposes, medians were used to summarize central tendencies in these results, while inter-quartile ranges were used to discuss variation.

- Boaters identified flows slightly higher than the lowest in the study (250 cfs) as a minimum to use the river for transportation. They also recognized that quality "standard trips" are not provided until flows are above about 325 cfs and that optimal range for "standard trips" is from about 350 to 525 cfs.
- Boaters appeared less able to recognize differences between "standard" trips and "high challenge" trips; there was considerable overlap of the optimal ranges for these opportunities (363 to 525 cfs for standard trips; 400 to 650 cfs for high challenge trips). If a transitional flow between these opportunities had to be chosen, it would probably be around 450 cfs (slightly higher than the highest flow in the study.
- There was greater variation among results for the higher end of the "high challenge" category and the highest safe flow than in other specified flow questions. The probable explanation is differences in skill levels among respondents. Focus group discussion suggested that flows above 410 cfs would feature fewer eddies for recoveries between rapids and require quicker reaction times; some of the more aggressive paddlers were interested in such challenge, while other boaters were not.

- There was some variation in choosing a single flow release for whitewater boating (if only one could be provided), with the median at 500, but with an inter-quartile range from 425 to 500 cfs. In all cases, the requested flows were slightly higher than the highest flow in the study.
- When offered a potential choice of two flows, the median responses were 375 and 550 cfs, suggesting some interest in a lower first day flow. This desire was also voiced in focus group meetings. Lower first day flows allow new boaters to learn the locations of, and lines through, major rapids.

Specified flow questions:

- Think of the river as a waterway used for transportation. What is the lowest flow you need to simply get down the river in your craft?
- Many people are interested in a "standard" whitewater trip at medium flows. Think of this "standard trip" for strong intermediate to advanced boaters using your craft. What is the lowest flow that provides a quality experience for this type of trip? What is the best or optimal range of flows for this type of trip?
- Some people are interested in taking trips at higher flows with more challenging whitewater. Think of this "high challenge trip" for advanced or expert boaters using your craft. What is the lowest flow that provides a quality experience for this type of trip? What is the best or optimal range of flows for this type of trip? What is the highest safe flow for your craft and skill level? If the Licensee released only one flow for boating, what flow would you prefer? If the Licensee released two flow levels that offer different types of boating experiences, what two flows would you prefer?

Integrating Overall and Specified Flows

Figure E5.2.8-13—Overall Flow Evaluation Curve and Median Specified Flows for all Boaters, overlays close-out results for the overall flow evaluation curve, and optimal flow ranges for different opportunities, based on median specified flow results for all boaters. Results show that the overall curve peaks in the middle of the optimal range for standard trips, which is also well within the optimal range for higher challenge trips. Results also show that the "technical range" (defined by the minimum flow to use the river for transportation and the lowest flow that provides quality standard trips) encompasses the flow when the overall curve crosses the marginal line. Finally, results suggest that boaters specified a best single flow slightly higher than the peak of the curve, while the "two best flows" were at the lower end of the standard range and in the middle of the high challenge range (but higher than the standard range).

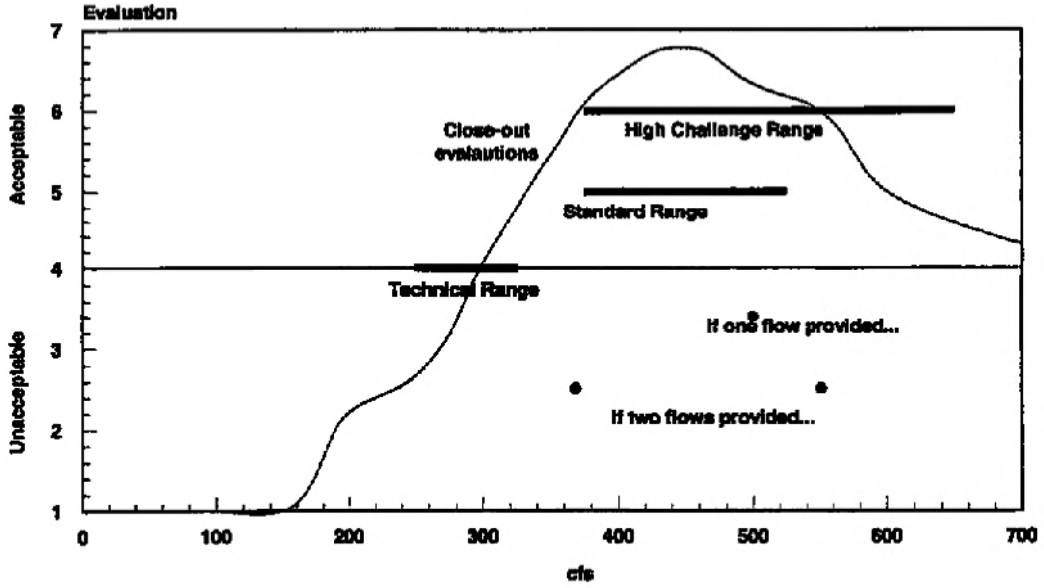


Figure E5.2.8-13
Overall Flow Evaluation Curve and Median Specified Flows for all Boaters

Integrating Seneca Reach Whitewater Information

Taking all the information about whitewater boating on Seneca Reach together, findings suggest that while boating can begin at as low as 200 cfs (the first flow tested was 210 cfs), higher flows from about 350 cfs are required to provide quality whitewater boating opportunities. Within this higher range, 350 cfs was identified as an optimum first day flow for boaters who have not run the reach before, but 450 cfs represents a better estimate of an optimum flow by most boaters with experience on the reach. However, more aggressive paddlers also appeared to be interested in flows around 500 cfs (although boaters in the study did not experience this level flow).

Assuming that the goal is to minimize lost generation capacity while providing quality recreational opportunities, it is possible to identify several threshold flows.

If a single release is contemplated, a flow around 400 cfs is recommended until rapid locations and lines become better known. After these become known, a single release of about 450 cfs would probably provide quality opportunities for most boaters.

If diversity of opportunities is possible via two distinct releases (on adjacent days of a weekend, for example), an initial combination of 350 and 450 cfs would probably be appropriate until rapid locations and lines become better known. Subsequently, flow combinations of 400 and 500 cfs would likely provide distinct standard and higher challenge opportunities for boaters new to the river and also for those who are more aggressive paddlers.

Given the general improvement in kayaking skills and equipment in recent years, it is possible that increasing numbers of boaters will be interested in flows higher than 500 cfs on Seneca Reach in future years. Because this study did not examine flows above 410 cfs, it is not prudent to extrapolate evaluations of higher flows. Some kayakers were clearly interested in flows between 500 to 700 cfs, while others thought those levels would be unsafe for many boaters. It is recommended that any decisions about flows in this higher range include options for modifications if boaters run and become familiar with the river, then show increased interest in higher flows.

E5.2.8.4.2 Similar Whitewater Boating Runs

This section reviews other whitewater boating runs in California similar to Belden and Seneca Reaches. It is largely based upon information in two California whitewater guidebooks (Holbek and Stanley 1998; Cassady and Calhoun 1995), but also includes estimates of driving time from Chico, Redding, and the Bay Area and some information collected from boaters participating in the controlled flow study.

The information is organized to:

- Identify nearby river segments that are similar to the two Project reaches (based on guidebook information and reviews of those findings from local boaters);
- Summarize characteristics of all the other runs in California with similar characteristics based on guidebooks; and

- Compare Belden and Seneca Reaches to other regional and state rivers based on survey results given by participants in the boating study.

Discussion focuses on an overall assessment of the quality of each run in comparison to regional and state alternatives, as well as preliminary estimates of possible use levels if whitewater flows were provided in the future.

E5.2.8.4.2.1 Similar to Belden Reach

Table E5.2.8-10 lists ten river segments similar to the Belden Reach based on guidebook information about whitewater difficulty, length, accessibility to rafts, and proximity to Chico (the nearest large city with a substantial whitewater community). It also includes three additional reaches that local boaters identified (these did not show up in the guidebook database search because they had Class II or Class V water at some flow levels). For each, guidebook information about the reach's length, difficulty, gradient, season of use, and driving time from Chico, Redding, and the Bay Area is provided.

Based on discussions with local boaters (notably Steindorf and Lewis) three of the 10 guidebook-based rivers appear to attract very little use because of specific defects and may not be the best examples of substitutes. For example, Stoney Creek apparently lacks more than a few larger rapids and is more creek-like than Belden; Englebright Reach on the Yuba River has difficult access, a single, high quality rapid, and several miles of Class I/II water; and Lavezzola Creek is short, creek-like, and may not provide good rafting.

Reviewing all of the 13 similar rivers, only four are commonly available in summer and fall: Cache Creek, Tunnel Run on the Middle Fork of the American River, and Pigeon Point Run on the Trinity and the Upper McCloud Rivers. Notably, Rock Creek Run further downstream on the NFFR is scheduled to have whitewater flows provided on 1 day per month throughout the year. In general, however, all these segments are larger rivers with generally higher flows and slightly lower gradients.

Table E5.2.8-10
Whitewater River Segments Similar to Belden Reach

River and Segment		Length (miles)	Class (low/high)		Gradient (fpm)	Season*	Hours driving from...		
							Chico	Redding	Bay Area
From Guidebooks:									
NFFR	Cresta Run	6.5	III	IV	48	2+	0.5	1.5	3
Stoney Creek	Fouts Springs to Dam	5	IV	IV+	65	1	2	2.5	3
Cache Creek	Rowboat Rapid Run	6	II+	IV	28	1, 2, 3	1.5	2.5	2.5
Yuba	Englebright Dam to SR 20 Bridge	6	III	III	10	2, 3	1.5	2.5	2.5
South Fork Yuba	Edwards to Purdons Crossing	4	III	IV+	65	2	1.5	2.5	2.5
South Fork Yuba	Washington to Edwards	14	IV	IV	46	2	1.5	2.5	2.5
Trinity	Pigeon Point Run	5.7	II	IV	24	1, 2, 3, 4	2	1	4.5
Lavezzola Creek		3.3	IV	IV	121	1, 2	2	3	4
Middle Fork American	Tunnel Run	17	IV	IV	23	2, 3	2	3	3
North Fork American	Chamberlain Falls	4.8	III	IV+	44	1, 2	2.5	3.5	3.5
From Local Boaters:									
McCloud	Upper or Hearst Run	11	II	IV	69	2, 3	2	1	5.5
North Fork Yuba	Goodyear's Bar	8.5	IV	V-	49	2	1.5	2.5	2.5
East Branch Feather	Virgilia to Belden	10	IV-	V-	40	2	1.5	2.5	3.5

**Seasons: 1=winter, 2=spring, 3=summer, 4=fall, +=periodic whitewater releases; fpm=feet per mile*

Source: EDAW, Inc.

Table E5.2.8-11 summarizes characteristics of three groups of California whitewater river segments similar to Belden Reach (Class III/IV and raftable at some flows) based on guidebook information. The first group includes the rivers within 2 hours of Chico; the second includes all the rivers within 4 hours of Chico; the last includes all rivers statewide.

For each group, guidebook information summaries of whitewater difficulty, length of river and shuttles, the maximum and average gradient, and flow ranges (when they can be run) are provided. The data help suggest typical characteristics of similar rivers.

Results suggest there are nearly 40 comparable segments statewide, with about three-quarters of those within 4 hours of Chico (but only 11 within 2 hours). Most of these runs, however, appear to feature Class IV rapids more than Class III/IV rapids, so Belden Reach is probably on the easier end of the spectrum than many of these segments. At about 8 or 9 miles in length (depending upon launch sites used), Belden Run is slightly longer on average than many of these runs, but with a good short shuttle. Like many of these reaches, it has few portages, similar gradient levels, and appears to offer the best boating at flows in the 500 to 1,500 cfs range.

Results from statewide analyses are potentially misleading regarding the availability of runs in summer and fall. Of the 11 segments identified with summer flows, at least three may not provide quality whitewater trips on a regular basis during those periods.

Table E5.2.8-11
Summary Characteristics of River Segments Similar to Belden Reach

	Within 2 hours of Chico	Within 4 hours of Chico	Statewide
Number of Segments	11	31	39
Whitewater Difficulty at Low Water			
Segments with Class II	2	8	10
Segments with Class III	4	14	19
Segments with Class IV	5	9	10
Whitewater Difficulty at High Water			
Segments with Class II	0	0	1
Segments with Class III	1	6	8
Segments with Class IV	10	25	30
Flows Identified for Boating (cfs)			
Median minimum flow	500	500	500
Median maximum flow	2,000	1,500	1,500
Median ideal flow	1,500	1,200	1,200
Segments with minimum flow <500 cfs	6	8	8
Segments with maximum flow >1,500 cfs	8	15	19
Segments with ideal flow between 500–1,500 cfs	8	24	30
Gradient (fpm)			
Median average gradient	46.0	46.0	40.0
Median maximum gradient	46.0	48.0	45.0
Length Of Run (miles)			
Average	6.9	8.6	8.6
Median	6.0	6.0	6.0
Segments between 7 and 15 miles-long	2	8	10
Shuttle Length (miles)			
Average	10.3	12.9	12.1
Median	6.5	7.0	7.0
Portages			
Number with any	5	7	8
Number with more than one	0	1	1
Accessible to Rafts?			
Number "Yes"	8	25	33
Number "Maybe, Possibly, or Probably"	3	6	6
Season			
Number with one season only	4	10	14
Number with summer flows	4	10	11
Number with all year flows	1	3	3
Type of Hydrology			
Number with "Natural"	2	12	20
Number with "Power Releases"	2	2	2
Number with "Spills"	2	4	4
Number with "Mixed"	5	13	13

Source: EDAW, Inc.

For example, the Lower Silver Fork of the American River rarely offers boatable flows all summer; release modifications in recent years have limited boating on Fordyce Creek; and the Lotus Run on the South Fork American is essentially Class II at low summer flows.

Figure E5.2.8-14 shows results from a survey that asked boaters to rate Belden Reach in comparison to other northern California rivers, other California rivers, and other rivers in the western United States (US). Most of these boaters had extensive experience boating, and the presumption was that most are familiar with other rivers in the region and the state, with many also familiar with other rivers in the western US. Responses were on a 5-point scale from "worse than average," to "average," "better than average," "excellent," and "among the very best." Results suggest that the reach is not considered particularly outstanding either regionally or statewide: no one reported it was "among the very best," and roughly equal numbers reported it was "average" or "worse" compared with "better than average" or "excellent."

Seneca Reach

Table E5.2.8-12 lists 10 river segments similar to Seneca Reach based on guidebook information about whitewater difficulty, length, accessibility to rafts, and proximity to Chico, the nearest large city with a substantial whitewater community.

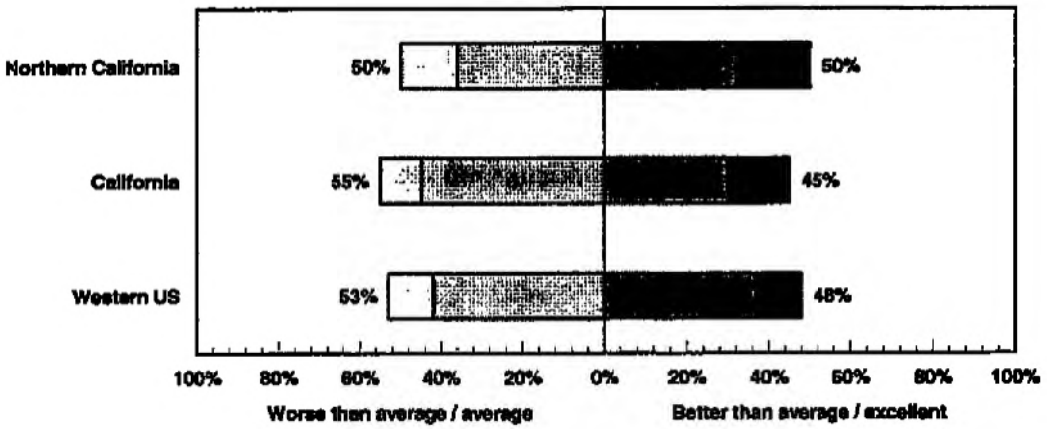


Figure E5.2.8-14
Belden Reach Ratings in Comparison to Other Rivers

Table E5.2.8-12
Whitewater River Segments Similar to Seneca Reach

River and Segment		Length (miles)	Class (low/high)		Gradient (fpm)	Season*	Hours driving from...		
							Chico	Redding	Bay Area
From Guidebooks:									
West Branch Feather	Ben and Jerry's Gorge	4	V	V+	118	1, 2	1	1.5	3
West Branch Feather	Upper	3.3	IV	V	64	1, 2	1	1.5	3
NFFR	Poe Run	7.5	IV+	V	70	2	1	1.5	3
Middle Fork Feather	Bald Rock Canyon	6.5	V+	V+	108	2	1	1.5	3
Middle Fork Yuba	SR 49 to Englebright	12	IV	V	73	2	1.5	2.5	2.5
South Fork Yuba	Kingvale–Indian Springs	8.7	IV+	IV+	69	2	2	3	3
South Fork Yuba	Indian to Lake Spaulding	5.5	IV	V-	123	2	2	3	3
South Fork Yuba	Purdons Crossing to SR 49	4	V	V+	125	2	2	3	3
South Fork Yuba	SR 49 to Bridgeport	7.2	IV	V	90	2	2	3	3
North Fork Trinity		14	IV	V	104	2	2	1	5
From Local Boaters:									
Butte Creek		6.2	IV	V	95	2	2	0.5	2.5
Deer Creek	Potato Patch Run	17	IV	V	100	2	1	1	4
Lavezzola Creek		3.3	IV	IV	121	1, 2	2	3	4
North Fork Yuba	Sierra to Downieville	13	IV	V	109	2	2	3	3

**Seasons: 1=winter, 2=spring, 3=summer, 4=fall, +=periodic whitewater releases*

Source: EDAW, Inc.

It also includes four additional reaches that local boaters identified as similar. For each, guidebook information about the reach's length, difficulty, gradient, season of use, and estimated driving time from Chico, Redding, and the Bay Area is provided. In most cases, these runs are on small headwater streams and only available during winter or spring run-off periods.

Based on discussions with local boaters (notably Steindorf and Lewis) three of the 10 guidebook-based rivers (the three South Fork Yuba reaches from Kingvale to SR 49) appear to attract very little use because of several portages or the presence of Interstate-(I-) 80. When these three reaches are boatable, many other rivers with superior whitewater, access, and fewer portages are likely to be available.

Table E5.2.8-13 summarizes characteristics of three groups of California whitewater river segments similar to Seneca Reach (Class IV/V whitewater and generally not raftable). The first group includes rivers within 2 hours of Chico; the second includes all rivers within 4 hours of Chico; the last includes all rivers statewide. For each group, whitewater difficulty, length of river and shuttles, the maximum and average gradient, and flow ranges (when they can be run) were summarized. The data help suggest typical characteristics of similar rivers.

Results suggest there are over 70 comparable segments statewide, with over half within 4 hours of Chico (and about one-third within 2 hours).

Table E5.2.8-13
Summary Characteristics of River Segments Similar to Seneca Reach

	Within 2 hours of Chico	Within 4 hours of Chico	Statewide
Number of Segments	25	44	73
Whitewater Difficulty at Low Water			
Segments with Class IV	13	23	34
Segments with Class V	12	21	39
Whitewater Difficulty at High Water			
Segments with Class IV	1	4	5
Segments with Class V	24	40	68
Flows Identified for Boating (cfs)			
Median minimum flow	500	500	400
Median maximum flow	1,200	1,000	1,000
Median ideal flow	800	800	800
Segments with minimum flow <400 cfs	8	16	37
Segments with maximum flow >800 cfs	18	31	42
Segments with ideal flow between 400–800 cfs	11	23	36
Gradient (fpm)			
Median average gradient	108	108	117
Median maximum gradient	140	163	170
Length of Run (miles)			
Average	11.1	10.5	10.7
Median	8.7	8.9	7.8
Segments between 7 and 15 miles long	9	20	29
Shuttle Length (miles)			
Average	18.6	17	22
Median	14	14	13
Portages			
Number with any	21	38	58
Number with more than 1	17	30	47
Season			
Number with one season only	17	26	42
Number with summer flows	2	3	11
Number with all year flows	0	0	0
Type of Hydrology			
Number with "natural"	17	32	55
Number with "power releases"	1	1	1
Number with "spills"	6	9	15
Number with "mixed"	1	2	2

Source: EDAW, Inc.

Most of these runs, however, appear to feature Class V rapids more than Class IV/V rapids; Seneca Reach is probably on the easier end of the spectrum than many of these steep creek-like segments. However, at about 11 miles in length (depending upon put-in or take-out), Seneca Run is generally longer than many of these runs, and it appears to have fewer portages as well (many similar runs have multiple portages). It has similar gradient levels to many of the reaches, however, and appears to offer the best boating at flows in the 300 to 800 cfs range.

Figure E5.2.8-15 shows results from a question asking study boaters to rate the Seneca Reach in comparison to other northern California rivers, other California rivers, and other rivers in the western US. These boaters all have extensive kayaking experience in the region, the state and in the western US. Responses were on a 5-point scale from "worse than average," to "average," "better than average," "excellent," and "among the very best."

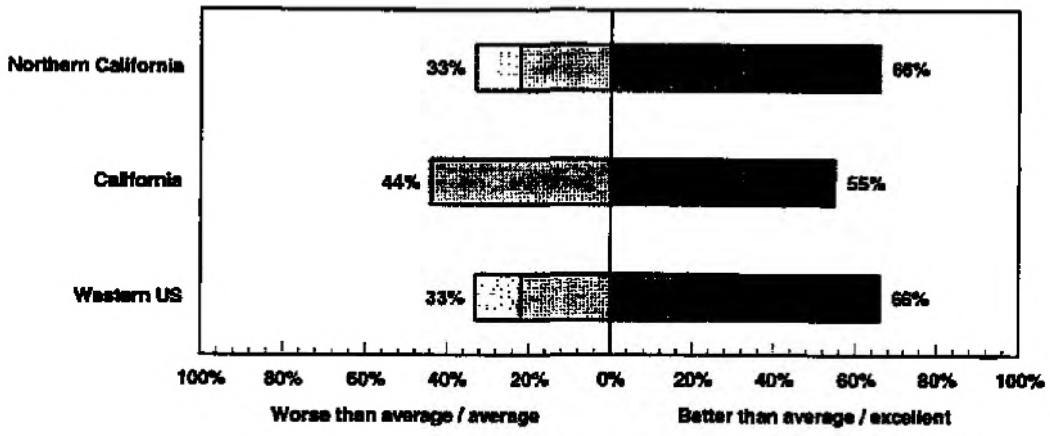


Figure E5.2.8-15
Seneca Reach Ratings in Comparison to Other Rivers

Results suggest that Seneca Reach is rated more favorably than Belden Reach, but about a third considered the run average or worse than average among northern California rivers.

Conclusions

Neither Belden nor Seneca Reach appears to offer outstanding whitewater boating opportunities compared to similar runs in the region or state. While both reaches are likely to receive use if boating flows were available, use would probably remain low if other similar segments also had boatable flows (e.g., in the winter or spring).

As dam-controlled segments, there is potential to offer boatable flows on either reach at times outside the winter/spring seasons when alternative runs are available. It is also possible to coordinate flows on these segments with other dam-controlled segments in the area (e.g., Rock Creek, Cresta, and perhaps Poe) to provide boatable runs during the "off-season." In these situations, either reach is likely to receive considerably higher use, at least initially, as boaters in the region explore the new segments.

Belden Reach has the potential to attract intermediate–advanced kayakers and rafters in warmer summer and early fall months. As a relatively easy Class III/IV river featuring continuous rather than pool/drop rapids, it offers a relatively rare opportunity for boaters to develop creek boating skills during a time of the year when few similar rivers are available.

Belden Reach also has some commercial rafting potential because of easy access and longer than average length compared to similar rivers. There was apparently some commercial rafting on the reach in the 1970s (after the construction of Belden Forebay and Powerhouse in 1958, but before full capacity of that facility was typically used), although the nature of these operations and the flows that they used has not been confirmed. Based on discussions with the rafters during the controlled flow study, vegetation removal at selected sites is probably a prerequisite to successful commercial use because existing brambles limit raftable lines in some rapids and make rescuing swimmers more hazardous.

Seneca Reach is likely to attract slightly more attention in the boating community than Belden Reach because of its difficulty and because it is a relatively unknown segment of river. However, the higher skill level requirements of the reach decreases the number of boaters who could run it, and there are many other high quality substitute opportunities in the region available during the winter, spring and early summer. Like Belden Reach, however, if boatable flows were offered during the warmer summer and early fall months, when other similar segments were not available, there is likely to be substantial use on the run. Seneca Reach does not approach the quality of the Middle Fork of the Feather River nor other nearby runs, but it does offer Class V rapids with few portages within a scenic canyon.

Estimating use on any river that has not seen boatable flows or use in the recent past is extremely difficult.

Use levels depend on complex considerations that may include flows, weather, proximity, access, travel costs, and availability of alternative runs. Publicity about the availability of runs could also have significant effects on use levels. With these difficulties in mind, and after discussions with prominent individuals in the local boating community, estimates of use on the reaches (if flows are provided) are listed below.

- Assuming optimum flows were provided on Belden Reach one weekend a month during the spring or early summer periods when other opportunities are available, relatively low use levels on Belden Reach are estimated: probably less than 10 to 15 people per day on weekends.
- If those flows were provided on Belden Reach periodically during warmer months when fewer rivers offer good substitutes (one weekend per month in July, August and September), use could triple compared to spring periods: about 30 to 50 people per day.

E5.2.8.4.3 Economic Value of Whitewater Boating

This section reviews literature related to the economic value of whitewater boating in an effort to assign value to potential whitewater boating on the UNFFR.

E5.2.8.4.3.1 Concepts

Economists study the costs and benefits of individual, collective, and institutional decisions, and examine how those decisions could affect the well being of individuals or society. In general, economists define a "benefit" as "anything contributing to an improvement in condition" while a "cost" is a "loss, sacrifice, or detriment."

Because the range of benefits and costs can be enormous, much of the work in economics focuses on assessing that range using a single metric (dollars).

This is an extremely complicated task, illustrated by the valuation comparison between water and diamonds (Peterson et al. 1990). Water is essential for human survival, but it is also widely available and relatively inexpensive. Diamonds, by contrast, are hardly necessary for survival, but they are relatively scarce and valuable from a price perspective. So which is worth more? The answer depends on context: are you in the desert for three days without supplies, or are you about to ask someone to marry you?

In the context of recreation management, recurring economic issues focus on: the costs of building and maintaining recreation facilities, the estimation of recreation demand, the economic impact of recreationists' expenditures on local and regional economies, the willingness of recreation users to pay fees for use of facilities or access to recreation areas, and the value of recreational opportunities in a broader–welfare economics model (Loomis and Walsh 1997).

For the purposes of this study, the focus was on estimating the economic value of a user day of whitewater boating, a non-market good. People pay some costs to whitewater boat, but the value of those trips exceeds costs.

That value is generally not captured by commercial entities or managing agencies, but rather by the individual taking the trip. This is called use value—what a day of boating is worth to a person. Use vales for the UNFFR could be estimated based on a review of previous studies for other rivers.

It is important to recognize that use value is not the only economic issue involved in assessing the value of whitewater boating. Other types of economic value information that may also apply (but are beyond the scope of this report) are described below.

- **Local Economic Impacts.** These impacts are associated with expenditures of boaters while participating in an activity (e.g., food, lodging, gas, equipment, shuttles, etc.). The impacts of increased boating in a localized region can be significant if use levels are high and alternative recreational opportunities in the area are few (Loomis and Walsh 1997). Studies have documented large local income and employment multipliers in areas where there is significant recreational boating (English and Bowker 1996; Cordell et al. 1990), and one application suggests that 13,000 user days by kayakers at a "whitewater park" in Golden, CO cost an average of $33 per day, and created $441,000 to $882,000 in economic stimulus to the local economy (Hagenstad et al. 2000). From a national or large regional perspective, however, boater expenditures associated with a single river are essentially negligible because boaters would spend similar amounts of money running another river or doing another activity in the same region even if the studied river was unavailable (Loomis and Walsh 1997).

- **Option, Bequest, and Existence Value.** These focus on the value of rivers or whitewater opportunities for people who are not currently using the resource, but who might want to use it in the future (option value); want future generations to be able to use it in the future (bequest value); or appreciate the existence of those opportunities even if they will never use them (existence value). These types of values are more difficult to quantify, but a contingent valuation study by Sanders et al. (1990) suggests that the per person value of 11 possible National Wild and Scenic Rivers (WSRs) in Colorado averaged about $95. Applied to the population of the state, the total value of protecting those rivers from additional dams and development was $1,430,000,000. When considering just three of the 11 rivers, they estimated that preservation value (bequest, option, and existence value) was worth about 81 percent of the total, while use value was worth only 19 percent. National WSR designation and protection of several large rivers in Colorado obviously represents a different context than providing flows on two relatively small hydropower bypass reaches on the UNFFR. However, this study helps illustrate that preservation value of rivers can be significant.
- **Place Identity Value.** A final value associated with whitewater rivers focuses on community-building benefits attached to identification with local resources and recreational opportunities.

This is part of the "preservation value" discussed in Sanders et al. (1990), but was more specifically identified by Hagenstad et al. (2000) for a whitewater park in Golden, CO (although they did not quantify the amount). In areas where tourism and quality of life resources are central to a community's identity, this value could be significant.

Estimating Use Value

In general, use value is estimated using one of two basic techniques. The first is called the travel cost method (TCM) and it is based on the premise that the number of trips to a recreation site will decrease with the distance traveled, all other things being equal (Loomis and Walsh 1997).

Using data that summarizes the number of people recreating at a site from different zones (with presumably different travel costs), it is possible to develop a demand curve that relates visits to costs, and thus calculate the "consumer surplus" of providing that recreational opportunity at any given cost level. TCM is based on actual behavior, and arguably provides more accurate estimates for single sites that are used by a local or regional population whose visits are focused on the site in question (Loomis and Walsh 1997). However, there are several more complex variations of TCM which can be used for sites that are used by national or larger regional populations, or in combination with other sites. There are also ways to incorporate how changes in quality at a site may affect demand and the value associated with visits.

The second technique is called the contingent valuation method (CVM) but is also known as willingness to pay (WTP). In these studies, researchers attempt to create a hypothetical market for the non-market good by asking what participants would be willing to pay above and beyond expenses. There are several complex methodological issues involved in conducting these studies well (Loomis and Walsh 1997; Mitchell and Carson 1989), but researchers suggest that well-designed studies produce valid results which appear consistent with TCM study findings.

A Review of Previous Use Value Studies

A number of studies have attempted to identify the use value of whitewater boating (per person, per day), as summarized in Table E5.2.8-14. The table lists the river, the methodology used, translates reported study values into 2001 dollars (using consumer price index tables from Sahr 2001), and provides a citation for each study. Several of these studies have been summarized previously in Walsh et al. (1992), which included adjustments to figures based on methodology considerations (generally adding value to account for travel cost method estimates which did not include travel time in the methodology). Because it is beyond the scope of this report to examine the details of these studies, those adjustments and associated explanations have been omitted.

Figures have been rounded to the nearest dollar to simplify discussion and imply appropriate levels of precision.

Table E5.2.8-14
Summary of Daily Value of Whitewater Boating from Several Studies

River	Methodology	Value and Year	2001 (dollars)	Citation
Middle Fork Salmon, ID	TCM	76 (1969)	365	Michaelson 1977
Grand Canyon rafting	CVM	94 (1985)	154	Boyle and Bishop 1988
Middle Fork Salmon, ID	TCM	50 (1979)	121	Rosenthal 1984
Rogue River	CVM	53 (1985)	88	Johnson and Johnson 1990
Main Salmon, ID	TCM	13 (1969)	63	Michaelson 1977
Westwater Canyon, UT	CVM	19 (1978)	51	Bowes and Loomis 1980
11 Colorado Rivers	CVM	25 (1983)	44	Sanders et al. 1991
Glen Canyon, AZ	CVM	26 (1985)	43	Boyle and Bishop 1988
St. Joe River, ID	TCM	9 (1971)	39	Michaelson 1977
Golden Whitewater Park	Estimate	36 (2000)	37	Hagenstad et al. 2000
11 Colorado rivers (kayaks)	CVM	13 (1978)	35	Walsh et al. 1988
11 Colorado rivers (rafting)	CVM	11 (1978)	30	Walsh et al. 1988
Chattanooga River	TCM	8 (1979)	20	Klemperer et al. 1984
Rio Mameyes, Puerto Rico	Both	13 (1995)	15	Loomis and Gonzalez-Caban 1997
Average Value: All Rivers			79	
Median Value: All Rivers			44	

Source: EDAW, Inc.

Taken together, results suggest that the use value of whitewater boating (per person, per day) is between $30 and $50 for most rivers, although certain outstanding rivers (e.g., Grand Canyon, Middle Fork of the Salmon River) may have considerably more value. Hagenstad et al. (2000) reported that an unpublished database compiled by Loomis suggests a national average of $33 per day of whitewater boating, with some regions of the country showing slightly higher amounts (e.g., $40 for the inter-mountain or Rocky Mountain region). These figures are consistent with those presented here.

Caution is urged in using these estimates to assess value for UNFFR reaches. Most of the rivers in this review are nationally prominent, involve multi-day trips, and have arguably higher quality whitewater and wilderness characteristics.

The UNFFR reaches feature day runs and relatively high levels of development (mining, roads, and hydropower facilities).

As discussed previously, neither Belden nor Seneca Reach is particularly outstanding in a regional context. Accordingly, if other opportunities are available when flows are provided, the value of these rivers would likely fall below the $30 to $50 average discussed above (with the less outstanding Belden Reach probably having slightly less value per person than Seneca Reach). Given these assumptions, it is estimated that the use value of whitewater flows on the two reaches during spring and early summer (when other opportunities are available) is about $20 (Belden) and $25 (Seneca) per person per day.

In contrast, whitewater boating on the UNFFR reaches could be provided during other times of the year when competing opportunities are more scarce, and use values would likely increase substantially to average or even "above average" levels. If releases were provided at these times, it is estimated that use value would probably double to about $40 (Belden) and $50 (Seneca) per person, per day.

E5.2.8.4.3.2 Economic Issues Conclusion

Providing whitewater flows in the Belden and Seneca Reaches of the UNFFR would likely provide significant use value to participants, with some local economic stimulus also possible.

Calculating societal benefits of either use value or local economic impact, however, is difficult without good information about boater demand if flows were provided. As discussed previously, assessing this demand is very difficult without an appropriate history of a river's use.

E5.2.8.4.4 Fishability

This section describes findings associated with fishing opportunities, with a central focus on the fishing controlled flow study conducted in May 2001. Appendix E5-R—Additional Results from Recreation Fishability Study provides additional data from surveys which are not provided herein.

E5.2.8.4.4.1 Fishability Study Panel

Gender. The panel consisted of males (10) and one female.

Years Fishing. The panel has considerable experience fishing; the median number of years of experience was 15 years (fly-fishing, n=10), 25 years (spin-fishing, n=5), and 30 years (bait-fishing, n=1).

Frequency of Fishing. Most of the panelists fish several times per year. The median number of days was 30; the range varied from a low of 15 to a high of 100 days per year.

Fishing Trip Expenditures. Panel participants reported that they spend considerable amounts of money on fishing each year.

The median amount spent on equipment was $200 (range was from $50 to $1,000); the median amount spent on fishing trip costs was $500 (range was from $100 to $9,000).

Experience on the UNFFR. Seven of the 11 panelists (64 percent) had never seen UNFFR reaches prior to the study, while one had fished Seneca Reach and three had fished both reaches. Among those who had fished Seneca before, the median number of years of experience was 12.5 and the median number of days per year on the reach was 1.5. Among those who had fished Belden before, the median number of years of experience was 15 and the median number of days per year was 2.5.

Whitewater Experience. Seven of the 11 panelists (64 percent) reported that they also considered themselves whitewater boaters as well as anglers.

Fishing Preferences. The panel was asked to agree or disagree (on a 7-point scale with a "no opinion" mid-point) with 12 statements about their fishing preferences. Responses helped characterize panelists fishing interests and offered potential explanations for variations in other responses during the study. A summary of responses to each of the following statements is given in Figure E5.2.8-16—Panelists' Responses to Fishability Preference Items.

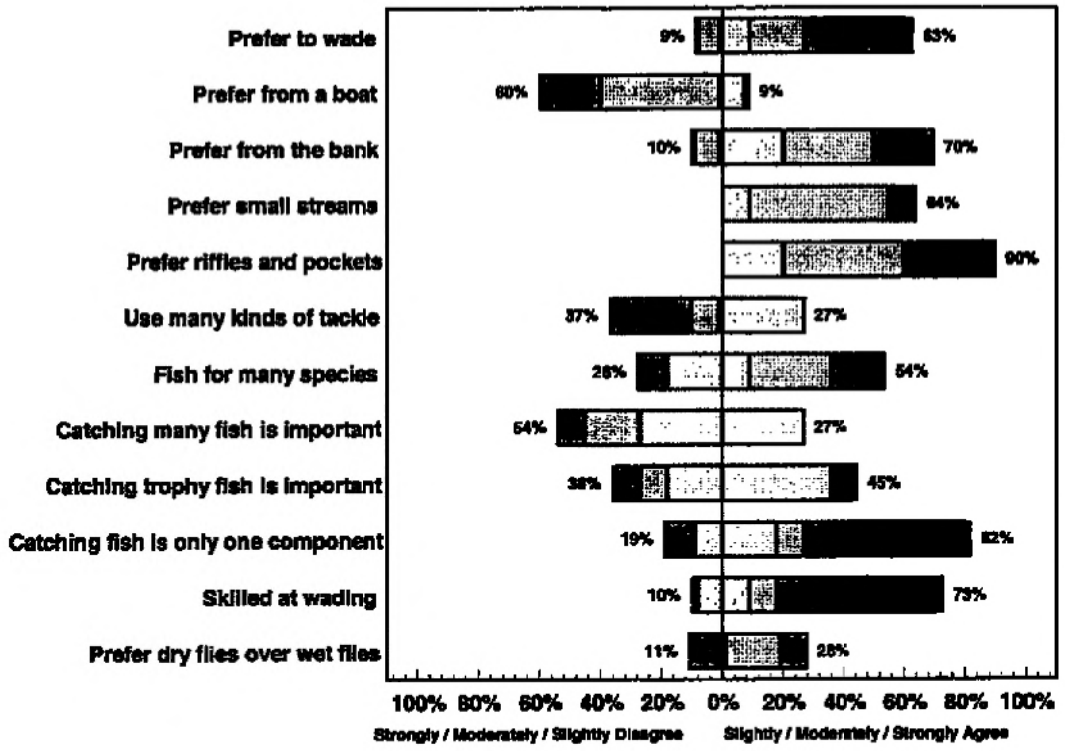


Figure E5.2.8-16
Panelists' Responses to Fishability Preference Items

Verbatim fishability preference items:

- In general, I prefer to wade when I fish;
- In general, I prefer to fish from a boat;
- In general, I prefer to fish from the bank;
- In general, I prefer to fish smaller streams than larger rivers;
- In general, I prefer to fish riffles, runs, or "pocket water" rather than pools;
- I use many different types of tackle (flies, lures, and bait) rather than specializing in one type;
- I fish for several different species rather than one or two key target species (e.g., rainbow trout);

- In general, catching many fish is the most important component of a high quality fishing trip;
- In general, catching trophy-sized fish is the most important component of a high quality fishing trip;
- In general, catching fish is only one component of a quality fishing trip;
- In general, I consider myself skilled at wading in relatively swift rivers; and
- I prefer dry fly-fishing rather than nymph or wet fly-fishing. (Fly anglers only—if you do both equally, choose 4)

The results listed below suggest several conclusions about the panel as a whole.

- The panel favored shore-based fishing (compared to boat fishing) on smaller streams, where they fish riffles and pockets rather than pools and deep holes. This general preference is appropriate for a panel examining UNFFR reaches, which are generally fished by shore-based anglers.
- Some of the panelists use relatively specialized tackle (fly anglers), although other members use a variety of tackle. Most panelists reported fishing for a variety of species.

  Among fly anglers, there was a slight preference for using dry flies over wet flies (nymphs).

- Anglers panelists are "experience-focused," and do not appear to base the quality of their trips purely upon the number and/or size of the fish they catch (54 percent disagreed that catching many fish is important, and 82 percent agreed that catching fish in general is only one component of a quality fishing trip). However, more anglers agreed than disagreed that catching trophy fish is the most important part of a trip.
- Most of the anglers reported that they are skilled waders. Over 70 percent reported that they typically wear wading equipment (hip waders, nylon chest waders, neoprene chest waders, or a mix of these) when they fish, while others mentioned during focus group discussions that if the weather and water are warm enough, they often wade without this equipment.

Subgroup Composition. Angler panelists indicated their perceptions of the importance of fly-fishing, spin-fishing, and bait-fishing and then were asked to complete evaluations. In general, panelists were more interested in fly-fishing than the other two types of fishing. The average importance ratings on a 5-point scale (1=not important and 5=extremely important) were 4.2 for fly-fishing, 2.2 for spin-fishing, and 1.8 for bait-fishing.

Of the 11 panel members, only seven rated conditions for fly angling; of those seven, four are considered "core fly anglers" because they were present throughout the study and completed a close-out survey based on their experiences with a variety of flows. For daily flow evaluations, in general, data from all fly anglers who were present was used.

For some daily results and for many questions from the close-out survey, data for this group was analyzed separately from the others for consistency purposes.

Of the remaining four panel members, three rated conditions for several types of angling but were only present on one day of flows (700 cfs). Only one spin/bait angler on the panel was present throughout the entire study. For daily flow evaluations, data from all the spin/bait anglers was used; for some daily results and all the close-out survey results, the results from the on spin/bait angler were used to represent those fishing interests.

E5.2.8.4.4.2 Belden Reach Results

This section describes results from the Belden Reach fishability controlled flow assessment (May 11–15, 2001). Anglers experienced the reach at approximately 700 and 300 cfs, while researchers experienced 100 cfs. Results include data from 11 panelists, although not all participants evaluated every flow or completed all sections of the surveys. Results for a core subgroup of fly anglers and a single spin/bait angler are often the focus of this section because they saw multiple flows and completed close-out surveys.

General Description of Flows

The following text describes conditions at the two controlled flows on Belden Reach, based on comments from focus group meetings. Additional comments regarding 100 and 140 cfs levels are also provided. Paraphrased comments from the focus group meetings are provided in Appendix E5-R.

700 cfs. This was the initial flow in the study; it offered an opportunity to experience the river at much higher than mid-summer levels. This flow essentially filled the channel and inundated much of the streamside vegetation; many steeper parts of the reach featured continuous whitewater rapids with large waves and hydraulics. This flow is similar to those that might be provided for whitewater boating and also offered an opportunity for anglers to evaluate the effect of those flows on fishing, if they were provided periodically. Anglers generally did not fish at this flow because of time constraints and the consensual opinion that fishability was poor. Belden Reach has a lower gradient than Seneca Reach, however, anglers agreed that there were at least a few locations where fishing was possible.

300 cfs. This second flow offered better wading conditions at several sites; anglers got in the water and fished at several locations, catching some small non-wild trout. In some wider locations it was possible to wade across the entire reach, but swifter, deeper channels were still a hazard. This flow is probably well below flows that might be released for whitewater boating. Panelists were asked to focus their evaluations on fishability and on whether the flow was provided on a sustained basis (e.g., if biologists suggested that it would improve aquatic habitat).

140 cfs. One panelist returned to the river on August 15, 2001 when the flow was at an estimated 140 cfs. The reach remained wide and fast, but was shallower than when at 300 cfs.

Some sites rated by anglers during the study appeared to be better fishing areas, but panelists may have overestimated the overall quality of the reach because other areas appeared too shallow for holding trout.

100 cfs. A pre-study reconnaissance was conducted at an estimated 100 cfs. The reach was generally shallower than during other flows, and it would have been relatively easy to wade or cross the river in all but the major drops and deepest pools. Panelists did not fish the river at this flow, but the general assessment was that trout would be holding in the few relatively deeper parts of the river. This would constrain the amount of reach available for fishing, but might increase fishability in areas where trout are likely to concentrate.

Post-Daily Preferred Flows

After each day and reach, panelists were asked to indicate their preferences for similar, higher, or lower flow levels. All participants considered 700 cfs too high, with 56 percent preferring lower flows and 44 percent preferring much lower flows. At 300 cfs, 75 percent preferred lower flows, but 25 percent indicated that they prefer flows at about that level. No one preferred flows that were "much lower" than 300 cfs.

Post-Daily Likelihood of Return

Panelists were asked whether they would be likely to return at the 300 and 700 cfs levels. Results suggest that 67 percent of fly anglers would definitely not return at 700 cfs, while 22 percent would possibly return and 11 percent would probably return.

At 300 cfs, 25 percent of the fly anglers would not return, while 50 percent would possibly return, and 25 percent would definitely return. The spin/bait angler indicated that he would possibly return at 700 cfs, but would definitely return at 300 cfs.

Flow Evaluation Curves from Close-Out Surveys

Panelists were asked to rate a series of 15 flows (from 25 to 1,200 cfs) on a 7-point acceptability scale for overall fishability. Connecting the mean scores for each flow creates a "flow evaluation curve." Figure E5.2.8-17—Flow Evaluations—Belden Reach Anglers, shows overall flow evaluation curves for participants who experienced multiple flows and completed close-out surveys.

The results listed below suggest several general conclusions.

- For fly anglers, acceptable flow levels appear to be between 50 and 250 cfs, with an optimal flow about 150 cfs.
- For the one spin/bait angler, acceptable flows began at about 275 cfs and remained acceptable until about 600 cfs; the optimal flow was 300 cfs.
- There appear to be significant differences between fly angling and spin/bait angling. Focus group discussions suggested that fly anglers require lower flows because they provide better wading access to the river as well as slower velocities in rapids. Spin/bait anglers do less wading (as a general rule, they do not need as much clearance from riparian vegetation to cast), and they are more likely to fish pools and runs where velocities vary less with changes in flow.

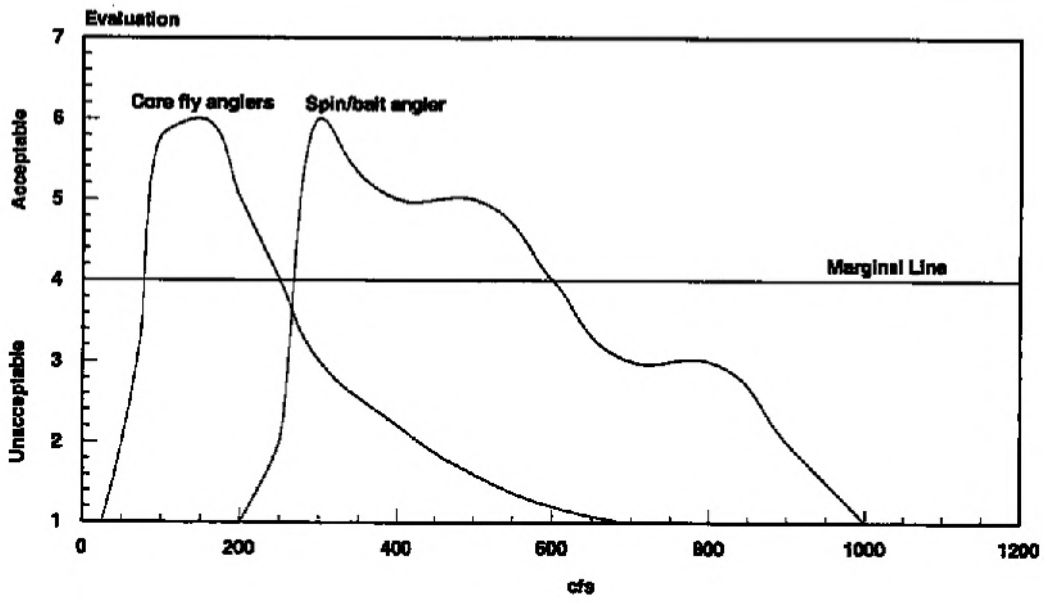


Figure E5.2.8-17
Flow Evaluations—Belden Reach Anglers

Specified Flows

The close-out survey also asked a series of "specified flow" questions to identify flow ranges that are optimum or acceptable for certain types of fishing; the flow range that should be provided for fishing in general; and the flow range that should be provided if one considered biological issues. For all other questions, anglers were asked to focus on flows that are good for fishing, rather than on flows that are good for the fish; a broader elaboration of this topic is provided below. Other specified flow questions asked panelists to identify a single, base fishing flow or two fishing flow levels to offer different types of fishing opportunities. The verbatim questions are listed below.

- Please specify the range of flows that provides acceptable quality for…
  - Fly-fishing
  - Spin-fishing
  - Bait-fishing
- Please specify the range of flows that provides the optimal or best flows for…
  - Fly-fishing
  - Spin-fishing
  - Bait-fishing
- Based on what you know about fishing on the Belden Reach, what is the lowest flow that should be provided?
- Based on what you know about fishing on the Belden Reach, what is the highest flow that should be provided?
- Based on what you know about fish biology, what is the lowest flow that should be provided on the Belden Reach?
- Based on what you know about fish biology, what is the highest flow that should be provided on the Belden Reach?
- If the Licensee released only one flow for fishing, what flow would you prefer?
- If the Licensee released two flow levels that offer different types of fishing opportunities, what two flows would you prefer?

Average responses are given in Table E5.2.8-15. Figure E5.2.8-18—Average Specified Flow Ranges for Different Types of Belden Reach Fishing, highlights acceptable and optimal ranges for the three types of fishing.

The results listed below suggest several findings, most of which are consistent with findings from the flow evaluation curve and daily evaluation results.

- Fly anglers prefer lower flows than those they experienced during the study, and estimated that flows between about 100 and 240 cfs would be acceptable, but that optimum levels range from 130 to 190 cfs.

Table E5.2.8-15
Mean Specified Flows for Core Fly Anglers and Spin/Bait Anglers

Site	Core Fly Anglers		Bait/Spin Anglers	
Subgroup Sample Size	4		1	
Acceptable Range for Fly-fishing	103	238		
Optimal Range for Fly-fishing	128	188		
Acceptable Range for Spin-fishing			200	375
Optimal Range for Spin-fishing			200	300
Acceptable Range for Bait-fishing			325	600
Optimal Range for Bait-fishing			375	500
Lowest–highest Range for all Fishing	114	260	300	2,000
Range for Fish (biological basis)	121	510	300	2,000
Single Flow for Fishing	167		275	
Two Flows for Fishing	134	218	275	700

Source: EDAW, Inc.

- The bait/spin angler suggested that flows for spin angling would be acceptable at levels as low as 200 cfs and as high as 375 cfs, but that the best flows are between 200 and 300 cfs (slightly higher than the best flows for fly angling).

- Bait angling, in contrast, was estimated to be acceptable from 325 cfs to 600 cfs, but was judged best between 375 and 500 cfs—in between the two study flows.

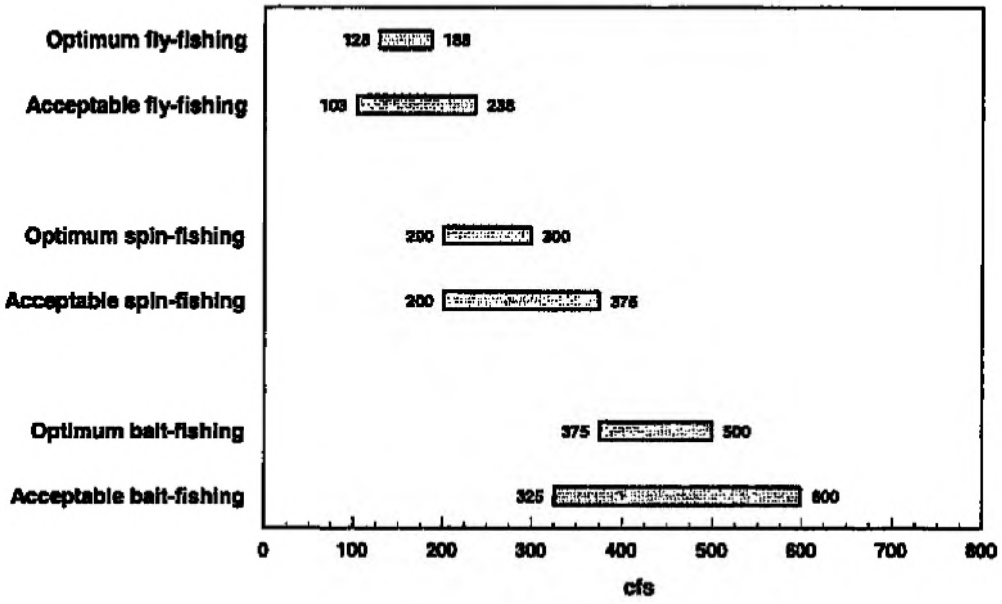


Figure E5.2.8-18
Average Specified Flow Ranges for Different Types of Belden Reach Fishing

- Panelists provided similar responses to questions regarding the overall fishing range and the range best for fish, based on their understanding of biological issues. Leaving aside the question of participants' fish biology expertise or whether they possessed information about fish flow needs on the UNFFR, anglers may have considerable difficulty separating evaluations of good fishing flows from those that they think are good for fish (additional discussion of this issue is presented in the conclusions section).
- When asked to specify a single flow to provide for fishing, participants generally chose one that falls in the middle of optimum ranges.

- When asked to specify two flows that might provide two different opportunities, fly anglers chose one at the low end of, and one that was slightly higher than, their optimum range (but still within the acceptable range). In contrast, the spin/bait angler specified one in the middle of the optimum spin angling range, and one above the bait-fishing acceptable range but within his "biological" range.

Other Findings Specific to Belden Reach

Important Attributes. Anglers were asked to rate the importance of various attributes of fishing experiences on Belden Reach during the close-out survey. Unsurprisingly, fly anglers unanimously rated the availability of good fly-fishing water as extremely important, while most did not even rate the importance of good spin- or bait-fishing water. Other important attributes were wadeability (4.5 on the 5-point scale), aesthetics (4.25) and likely fishing success (4.25). The spin/bait angler rated all six attributes as extremely important.

Importance of Providing a Diversity of Flow. Anglers were asked in separate questions whether it was important to provide a variety of fishing flows on Belden Reach to encourage different types of fishing experiences, or to provide opportunities for people with different skill levels and types of fishing gear. Four of the seven respondents that completed close-out surveys did not think it was important to provide a variety of flow levels for either case, and only one thought it was "extremely important" for both reasons.

One respondent thought it was only "slightly important" to provide different types of fishing, but "very important" to provide different opportunities for people with different skills. The latter response probably refers to differences in wading skills, a frequent topic of discussion during the study. Additional discussion about wading is provided in a separate section below.

Integrating Fishability Information for Belden Reach

Taken together, the preceding information suggests that lower flows (300 cfs or lower) would provide the best quality fishing conditions on Belden Reach. Although there are differences for different sites, this less steep, wider reach of the river is generally best for fishing when the river provides better wadeable access; lower velocities in riffles, runs, and pools; and less turbulence in the rapids. These best fishing flows are lower than good quality whitewater flows, indicating that fishing opportunities would be lost during the times of potential whitewater boating flows. Additional discussion of this potential conflict is provided in a separate section below.

There appear to be substantive differences between flow needs for fly-, spin-, and bait-fishing (with the latter two types offering good quality at higher flows than fly angling). Fly anglers indicated that conditions would probably improve as flows approach 150 to 200 cfs, while the spin/bait angler suggested that optimum flows were around 300 cfs.

The study does not offer quantitative information about optimum flows between 300 cfs and the current summer base flow of 140 cfs or the fall–winter base flow of 60 cfs. Based on discussion with anglers in the focus group meetings and on reconnaissance during lower flows, flows in the 140 to 200 cfs range are likely to provide nearly optimal conditions for fly-fishing, but more marginal conditions for spin- and bait-fishing. Wading would certainly improve at these lower levels, but the fishable water and variety of "fishing habitat" might decrease as fish become more concentrated (although this could be an advantage for less-skilled anglers).

Several participants noted biological concerns about current 140/60 cfs base flows, generally suggesting that higher base flows might improve fishery conditions (more insects and cooler temperatures might create more and bigger fish). Some participants also noted that lower flows concentrate fish to fewer areas, which probably improves fishing success, but lessens the need for skill to fish successfully, and thus increases pressure on the fishery. There was no consensus about current base flows with respect to fish biology (most were interested in seeing what the habitat studies would discover), or whether a new base flow higher than 140 cfs should be recommended. Additional discussion of anglers and biological issues is provided below.

If a single base flow were to be provided based on fishability study findings, the recommended flow would be about 175 cfs. This would provide high quality fly angling and probably provide acceptable quality spin and bait angling.

If multiple fish base flows are considered, two flows at 150 and 250 cfs might provide periods of optimal conditions for both fly and spin/bait-fishing without creating periods when either is unacceptable. If fish habitat or other biophysical findings suggest other base flows, these data suggest that any flow in the 150 to 300 cfs range is likely to provide acceptable conditions for one or more types of fishing.

E5.2.8.4.4.3 Seneca Reach Findings

This section describes results from the fishability controlled flow assessment on Seneca Reach (May 11–15, 2001). Panelists experienced the river at approximately 100, 300, and 700 cfs, while researchers (and two panelists) also experienced the reach at approximately 35 cfs outside of the study period. Results include data from 11 panelists, although not all participants evaluated every flow or completed all sections of the surveys. In some cases, results for a core subgroup of panelists (those that examined all three study flows) have been presented if they differ from the overall panel. One panelist returned in July to assess the 35 cfs level; his close-out evaluations were provided via a phone interview after that visit.

General Description of Flows

The following text describes conditions at the three controlled flows on Seneca Reach based on focus group discussion; paraphrased comments from the focus group meetings are provided in Appendix E5-R. Additional description of 35 cfs flow (observed by researchers) is also provided.

700 cfs. This was the initial flow in the study; it offered an opportunity to experience the river at much higher than usual levels. This flow inundates much of the streamside vegetation and appears to leave the defined channel in some areas. Most of the steeper parts of the river feature continuous whitewater rapids with large waves and hydraulics. This flow is above those studied for whitewater boating, although some boaters showed interest in running flows that high. The 700 cfs level was dictated by fish habitat modeling issues, but provided an opportunity for anglers to evaluate effects on fishing if flows were provided periodically for habitat maintenance purposes. Anglers generally did not fish at this flow because of time constraints and poor fishability. Seneca Reach has much steeper gradients than Belden Reach, and all anglers agreed it was hazardous to wade at this flow (with possible exceptions for larger pools).

300 cfs. This second flow offered some wadeable fishing water at Skinner Flat and Seneca Bridge, and anglers had fishing success at a number of sites (particularly Skinner Flat) catching small- to medium-sized wild trout. In only a few places it appeared possible to cross the river; most of the reach was too swift or deep. This flow represents the lower end of what might be released for whitewater boating; it was important to evaluate this level to help ascertain whether periodic whitewater releases would be compatible with fishing. It is also possible (although unlikely), that fish habitat modeling would suggest that flows this high be provided for some part of the year (possibly during spawning and rearing periods). In any case, anglers were asked to focus their evaluations on fishability if the flow were provided on a sustained basis.

100 cfs. The third day of flows provided much higher quality fishing for most panelists. The river was considerably more accessible for wading anglers (particularly at Skinner Flat and Seneca Bridge), and several anglers caught multiple small- to medium-sized fish. Water clarity continued to improve from higher flows. Anglers were asked to make evaluations based on if flows were provided at this level for a sustained period.

35 cfs. A pre-study reconnaissance was conducted on the day before the study at an estimated 35 cfs, the usual base flow in this reach. The reach was much shallower than at other flows in the study, and it was relatively easy to wade or cross the river in all but the deepest pools. Fishing was not undertaken at this flow, but the general assessment was that trout would be holding in the fewer relatively deeper parts of the river. This would constrain the amount of the river available for fishing, but might increase the chances of success in areas where trout are likely to concentrate. At these flows, pools are noticeably warmer and clearer.

Post-Daily Preferred Flows

After each day and for each reach, anglers were asked to indicate their preference for similar, higher, or lower flow levels. All anglers considered 700 cfs too high, with all fly anglers preferring flows that were much lower, while two bait/spin anglers were divided as to whether they preferred flows that were lower or much lower. At 300 cfs, all anglers thought flows should be lower, but none thought they should be much lower. At 100 cfs, all anglers reported that they preferred flows at about that level.

Post-Daily Likelihood of Return

Anglers were also asked whether they would be likely to return at the 100, 300 and 700 cfs levels. Results suggest that 67 percent of all fly anglers would definitely not return at 700 cfs, while 22 percent would possibly return and 11 percent (1 response) would definitely return. At 300 cfs, only 33 percent of the fly anglers would not return, while 67 percent would possibly return. At 100 cfs, 67 percent of the fly anglers said that they would definitely return, while 33 percent said they would possibly return. The spin/bait angler indicated that he would possibly return at 700 cfs, but would definitely return at the two lower flows.

Flow Evaluation Curves from Close-Out Survey

Anglers were asked in a close-out survey to rate a series of 15 flows (from 25 to 800 cfs) on a 7-point acceptability scale for overall fishability. Connecting mean scores for each flow creates a "flow evaluation curve." Figure E5.2.8-19—Flow Evaluation—Seneca Reach Anglers, shows two overall flow evaluation curves for participants who experienced multiple flows and completed close-out surveys.

The results listed below suggest several general conclusions.

- For fly anglers, acceptable flow levels appear to be between 50 and 250 cfs, with an optimal flow at 100 cfs; however, ratings sharply declined from 100 cfs, and were considered "near marginal" at 150 cfs.
- For the spin/bait angler, acceptable flows began at about 100 cfs and remained acceptable until about 300, but the optimal range was from about 150 to 250 cfs (with sharply lower ratings on either side of that range).

- There appear to be differences between fly angling and spin/bait angling, mirroring several other results. Focus group discussion suggested that fly anglers require lower flows because they provide better wading access to the river as well as slower velocities in rapids. Spin/bait anglers have less of a need to wade in the river (as a general rule, they do not need as much clearance from riparian vegetation to cast), and they are more likely to fish pools and runs where velocities change less with changes in flow.

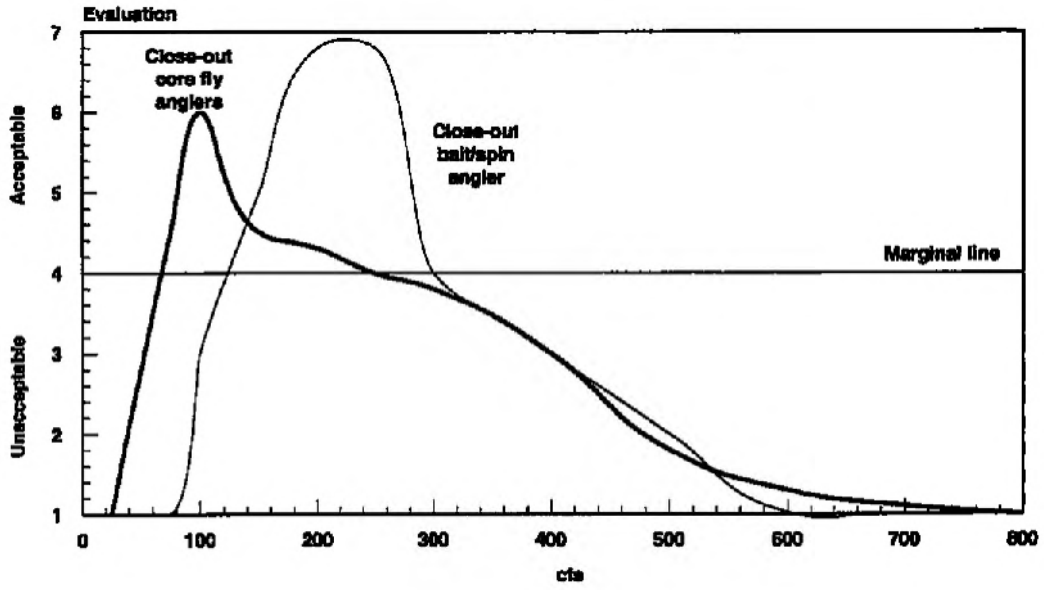


Figure E5.2.8-19
Flow Evaluation—Seneca Reach Anglers

Specified Flows

The close-out survey also asked a series of "specified flow" questions to identify flow ranges that are optimal or acceptable for certain types of fishing; the flow range that should be provided for fishing in general; and the flow range that should be provided if one considered biological issues.

For all other questions, anglers were asked to focus on the flows that are good for fishing, rather than on the flows that are good for the fish; a broader elaboration on this topic is provided below). Other specified flow questions asked respondents to identify a single, base fishing flow or two fishing flow levels offering different types of fishing opportunities. The verbatim questions are shown below.

- Please specify the range of flows that provides acceptable quality for…
  - Fly-fishing
  - Spin-fishing
  - Bait-fishing
- Please specify the range of flows that provides the optimal or best flows for…
  - Fly-fishing
  - Spin-fishing
  - Bait-fishing
- Based on what you know about fishing on the Seneca Reach, what is the lowest flow that should be provided?
- Based on what you know about fishing on the Seneca Reach, what is the highest flow that should be provided?
- Based on what you know about fish biology, what is the lowest flow that should be provided on the Seneca Reach?
- Based on what you know about fish biology, what is the highest flow that should be provided on the Seneca Reach?
- If the Licensee released only one flow for fishing, what flow would you prefer?

- If the Licensee released two flow levels that offer different types of fishing opportunities, what two flows would you prefer?

Average responses are given in Table E5.2.8-16. Figure E5.2.8-20—Average Specified Flow Ranges for Different Types of Seneca Reach Fishing, highlights acceptable and optimal ranges for three types of fishing.

Table E5.2.8-16
Mean Specified Flows for Core Fly Anglers and Bait/Spin Anglers (cfs)

Site	Core Fly Anglers		Bait/Spin Anglers	
Subgroup Sample Size	4		1	
Acceptable Range for Fly-fishing	71	225		
Optimal Range for Fly-fishing	90	175		
Acceptable Range for Spin-fishing			100	250
Optimal Range for Spin-fishing			100	175
Acceptable Range for Bait-fishing			100	300
Optimal Range for Bait-fishing			100	250
Lowest–highest Range for all Fishing	75	225	100	1,000
Range for Fish (biological basis)	73	725	175	2,000
Single Flow for Fishing	138		175	
Two Flows for Fishing	106	188	175	300

Source: EDAW, Inc.

The results listed below suggest several findings, most of which are consistent with other presented information about Seneca Reach.

- Fly anglers prefer lower flows, estimating that flows between 70 and 230 cfs would be acceptable, but that optimal levels would be in the range of 90 to 175 cfs.

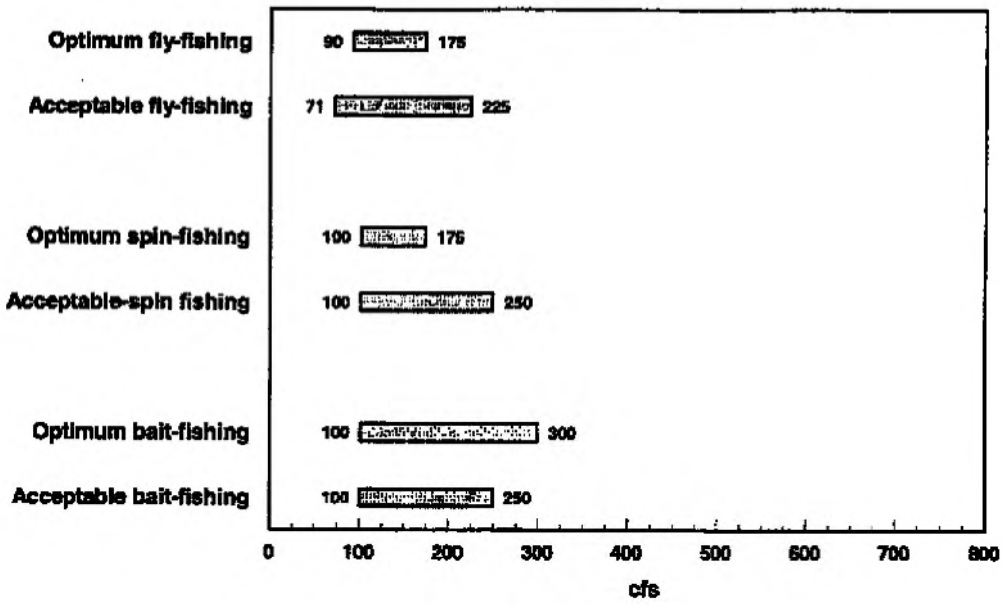


Figure E5.2.8-20
Average Specified Flow Ranges for Different Types of Seneca Reach Fishing

- The bait/spin angler suggested that flows for spin angling would be acceptable at as low as 100 cfs and at as high as 250 cfs; the best flows are between 100 and 175 cfs. These ranges are quite similar to those for fly anglers; but contrast results for Belden Reach, and some of the daily and overall flow preference results above (where fly anglers preferred significantly lower flows).
- Bait angling is estimated to be acceptable from 100 to 300 cfs, but were judged best between 100 and 250 cfs. As with Belden Reach results, bait angling appears to be more acceptable at higher flows than spin and fly angling.
- Panelists provided similar responses regarding the lower end of the overall fishing range and the range that was best for fish based on their understanding of biological issues.

However, they appeared to recognize that higher flows (a periodic "flushing flow" to clean spawning beds and maintain long-term habitat) may be valuable for biological reasons even though these flows may not provide good fishing. For the core fly anglers, this flushing flow was estimated at 725 cfs, while the spin/bait angler estimated 1,000 to 2,000 cfs. Leaving aside the question of participants' fish biology expertise or whether they possessed information about fish flow needs on the UNFFR, anglers sometimes have considerable difficulty separating evaluations of good fishing flows from those that they think are good for fish. Additional discussion of this issue is presented below.

- When asked to specify a single flow to provide for fishing, fly anglers generally chose one in the middle of their optimal range, while the spin angler chose one at the high end of his optimal range for spinning, but in the middle of his range for bait-fishing.
- When asked to specify two flows that might provide different opportunities, fly anglers chose one at the lower end of their optimal range and one that was slightly higher than their optimum range (but still within the acceptable range). In contrast, the spin/bait angler specified one at the higher end of his optimal spin-fishing range, and one at the higher end of his bait-fishing acceptable range.

Other Findings Specific to Seneca Reach

Important Attributes. Anglers were asked to rate the importance of various attributes of fishing experiences on Seneca Reach during the close-out survey. Similar to Belden Reach results, core fly anglers unanimously rated the availability of good fly-fishing water as extremely important, while most did not even rate the importance of good spin or bait-fishing water. Other important attributes were wadeability (4.5 on the 5-point scale), aesthetics (4.25) and likely fishing success (4.25). The spin and bait angler rated all six attributes as extremely important.

Importance of Providing a Diversity of Flows. Anglers were asked in separate questions whether it was important to provide a variety of fishing flows on Belden Reach for: different types of fishing experiences, or to provide opportunities for people with different skill levels and types of fishing gear. Responses were identical to Belden Reach responses.

Four of the seven respondents did not think it was important to provide a variety of flow levels for either case, and only one thought it was "extremely important" for both reasons. One respondent thought it was only "slightly important" to provide different types of fishing but "very important" to provide different opportunities for people with different skills. This response probably relates to differing wading skills, a frequent topic of discussion during the study. Additional discussion about wading is provided in a separate section below.

Integrating Fishability Information on Seneca Reach

Taken together, the preceding information suggests that lower flows in the study range (particularly around 100 to 200 cfs) would provide the best quality fishing conditions on Seneca Reach. Although there are differences for different sites, this steeper, narrow river generally is best for fishing when it provides better wadeability; lower velocities in riffles, runs, and pools; and less turbulence in the rapids. These "best" fishing flows are lower than "quality" whitewater flows, indicating that fishing opportunities would be lost during the times when whitewater boating flows are provided. Additional discussion of this potential conflict is provided in a separate section below.

While there are slight differences between flow needs for fly, spin, and bait-fishing (with the latter two types offering good quality at slightly higher flows than fly angling), all three types appear acceptable if in the 100 to 200 cfs range. This finding contrasts Belden Reach finding, where different types of fishing were optimized at more distinct ranges.

The study did not offer quantitative information about optimum flows between 100 cfs and the current base flow of 35 cfs. However, based on discussions with anglers during focus group meetings, flows at the higher end of this range are likely to provide nearly optimal fly-fishing, but only acceptable or marginal conditions for spin/bait anglers. Wading would certainly improve at these lower levels, but several anglers thought that fishable water and variety of "fishing habitat" might decrease as fish become more concentrated.

Several panelists noted biological concerns about the current 35 cfs base flow, generally suggesting that a higher base flow might improve fishery conditions in a number of ways (more insects and cooler temperatures might attract more and bigger fish). Some participants also noted that the lower flow concentrates fish in fewer areas (pools and pocket water), which probably increases fishing success, but decreases the skills necessary to fish successfully, and thus increases pressure on the wild fishery. There was no consensus on whether this base flow was unacceptable for fishing or biological reasons, or whether a new base flow higher than 35 cfs should be recommended.

If a single base flow were to be provided based on fishability study findings, 125 cfs should be recommended. This would provide high quality fly angling and a reasonable quality of spin and bait angling. If multiple fish base flows are considered, two flows at 100 and 200 cfs would provide periods of optimum conditions for both fly and spin/bait-fishing, without creating periods when either is unacceptable.

If fish habitat or other biophysical findings suggest other base flows, these data suggest that any flow from about 75 to 200 cfs is likely to provide acceptable fishing conditions for a variety of fishing types.

E5.2.8.4.4.4 Wadeability Experiments

Three panelists participated in limited "wadeability" experiments at the 300 cfs flow on Belden Reach.

As discussed in the methods section, anglers waded the river at a riffle/run area near the boating take-out at Gansner Bar Campground, stopping at various specific places in the current to rate wadeability on a 7-point scale (1=totally unacceptable to 7=totally acceptable). Using a flow meter, the depth and velocity were recorded. This allowed a comparison with the depth x velocity product, an indicator variable that hydrologists commonly use to estimate the threshold at which safe wading is no longer possible (the point when "human instability" is critical).

One previous study examined human instability in moving water by comparing threshold depth x velocity products for a variety of people and a non-human monolith at an indoor flume (Abt et al. 1989).

Results suggest that depth x velocity products are a good indicator of instability, humans are considerably more stable than a human-shaped monolith (because people can adjust their profile in the current to some degree), but that there is considerable variance in the products that cause different people to become unstable.

Products in this study ranged from 8 to 22, and variance appeared to be associated with subjects' weight, height, and the bottom surface in the flume. However, none of the latter aspects simulated a river channel, because the study focused on flood flows in urban environments. These figures contrast with the "rule of 10" or "rule of 12," which are word-of-mouth guidelines that hydrologists typically quote for the highest products that technicians should wade when conducting a cross-section.

For the purposes of this study a database that included subjects' evaluations of wadeability, not just critical "instability thresholds," was developed. It was assumed that most anglers do not want to "push" these limits, and that their wadeability thresholds have lower "rules of thumb" than those of hydrology technicians, or of the subjects in the flume study (who were tested in warmwater and did not have to cope with potentially slippery rocks in a real river channel).

Results are summarized in Figure E5.2.8-21—Relationship Between Belden Reach Wadeability Evaluations and Depth x Velocity Products, shows ratings in relation to three subjects, two of whom were over 6 feet 4 inches, and weighed over 200 pounds, with the third subject 5 feet 8 inches tall and 155 pounds).

Results depicted in Figure E5.2.8-21 and from qualitative discussions with participants during the experiments suggest a number of findings, as presented below. This initial data set is based on a small sample of participants, from a single area on the river—findings should be considered preliminary.

More work is necessary to support broader generalizations about wadeability on similar rivers where water clarity, water temperature, and slippery channel bottoms may be important factors.

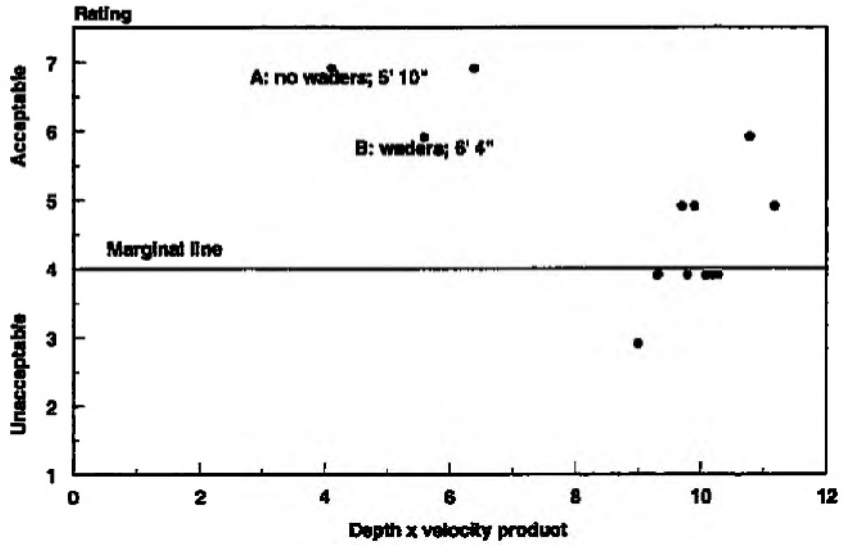


Figure E5.2.8-21
Relationship Between Belden Reach Wadeability Evaluations and Depth x Velocity Products

- Participants were reluctant to move themselves into depth x velocity combinations that might cause them to topple (even while wearing wet suits and personal flotation devices [PFDs]). This is consistent with the premise of the experiments: recreationists probably have a "comfort threshold" at lower products than at the "critical instability threshold."
- Participants had some difficulty making evaluations during the early part of the study, but soon developed better definitions of standards as the study progressed.

Participants generally agreed that a rating of 4 ("marginal") denoted the point when they feared they may topple or be swept downstream, but this is not necessarily the product that would actually cause such an that event. Ratings below 4 indicate varying degrees of discomfort; instability could occur at any "unacceptable" evaluation.

Ratings above 4 had to be "sustainable" and involve varying degrees of comfort. An evaluation of 7 suggested that it is "easy" to wade at that position and could be sustained indefinitely. Participants generally suggested that they might cross a stream with a rating of 4 or 5, but would probably not fish until ratings were 6 or higher.

- Fatigue could also play a role in deciding how long an angler would stay in a place. Future studies should probably establish more definitive standards which consider factors such as lengths of stays, crossing vs. fishing, and fatigue.
- Taking all participants together, a regression model was run with evaluations as the dependent variable and products as the independent variable. The products explained 44 percent of the variance in evaluations. In an alternative model that used depth and velocity as separate independent variables, 51 percent of the variance in evaluations was explained, but the velocity coefficient was not statistically significant (suggesting depth drives ratings more than velocities).
- Regression with small samples should be examined with some caution, but preliminary results suggest that products are a good indicator variable for evaluations.
- There appear to be some differences between subjects based on weight/height considerations. Taller and heavier people appear better able to withstand higher velocities and greater depths. Because of small samples, however, additional data are necessary to examine this relationship.

- The "rule of 10" or "rule of 12" used by hydrologists appears generally consistent with these results. Participants were able to wade at products between 10 and 11 several times; in some cases these products were rated as high as 6 on the acceptability scale. However, participants (particularly the lighter, less tall subject who was not wearing waders) sometimes rated products between 9 and 10 as marginal. Hydrologists typically carry a flow meter or depth rod when conducting cross-sections; this adds stability and so the rule of 10 or 12 may still make sense. For anglers without a wading stick, a lower product of about 8 or 9 may be a better indicator of an upper recreational threshold.
- Similarly, although participants were not asked to make as many evaluations at lower products, it appears that products around 5 to 7 are probably a better estimate of "comfortable" recreational wading (ratings of 6 or 7). In addition, because all of the participants in these wadeability experiments have spent considerable time in swift water and can be considered skilled, products as low as 3 to 5 may actually define the upper limit for comfortable wading by less-skilled waders.
- The sizes of cobble and boulders in the channel appear to be major factors based on qualitative assessments. A well-placed boulder in the channel (that is still well under the surface), can alternatively create a major challenge (if one stumbles upon it or while passing though increased velocities on either side) or provide a good prop for gaining one's balance (if one can push off it or stand in its eddy).

Real streams provide these challenges and sanctuaries, and skilled waders use them to their advantage. Studies must include sufficient numbers of cases with variation in these types of in-channel "irregularities" to accurately assess their impact on rating/product relationships.

E5.2.8.4.4.5 Boating and Fishing

This section describes additional attitudinal results from the fishability controlled flow assessment concerning potential whitewater releases. Anglers were asked to agree or disagree with a series of questions about potential fishing and boating conflicts on Belden and Seneca Reaches, as well as about potential biological effects from whitewater flows. Results provide a partial basis for discussion of angling vs. whitewater use conflicts, and potential confounds between evaluations for fishability (a recreational perspective) and fish habitat (a biological perspective).

Results include data from eight panelists who completed these parts of the close-out survey. Because of the small sample, results are presented for all anglers together. Results, organized by three topic areas, and verbatim survey items are listed below.

<u>Biological Issues</u>

- Whitewater flow releases may have negative impacts on the fishery; studies need to be completed before deciding if whitewater flows are appropriate.

- Flow releases for whitewater might have negative impacts on the fishery, but these could be minimized (adjusting the size and timing of flows to mimic natural events).
- Flow releases for whitewater could biologically damage the fishery and should never be provided.
- Even if whitewater flows are not shown to have negative impacts on the fishery, I oppose them because they will reduce the number of days that the river can be fished.
- Consistent boating use on a river may stress fish and have long-term effects on fishing.
- Occasional boating releases (400 to 800 cfs) are likely to lower the fishing quality for several days afterward.
- Occasional boating releases are unlikely to affect fishing quality for very long.
- A boat that passes through a fishing area tends to lower the chances of catching fish.

Use Issues

- It will be difficult for anglers to fish whitewater flows on the Belden Reach.
- There might be some flows that provide both good fishing and good whitewater.
- Boaters and anglers don't mix on a river as small as the Belden Reach.
- There may be some problems between boaters and anglers on the river if boating flows are provided.

- There won't be a problem between anglers and boaters as long as there are not too many boaters (less than one group per hour).
- There is unlikely to be a problem with boating flows because most people fish in the mornings and evenings and most boaters use the river during the middle of the day.
- Even if I don't encounter a boater, some river reaches should be for fishing only.
- In general, I prefer boaters to stay far away from me when they float by.
- In general, I prefer boaters to float by without talking to me while I am fishing.
- I would generally prefer boaters to be "bunched-up" in larger groups than have them "spread-out" and pass by periodically.
- It doesn't matter if boaters use the river at flows over 300/400 cfs because the fishing is poor then.
- It doesn't matter if boaters use the river at flows over 500/600 cfs because the fishing is poor then.
- Boaters in general are not a problem, but some specific boaters can be inconsiderate (making too much noise, scaring the fish, drifting too close, etc.).
- In general, I think there will be a conflict with anglers if boating flows are provided.

Fishing/Whitewater Boating/Biological Issues

Most of the anglers involved in the fishability controlled flow study were deeply concerned about the biological effects of managed flow regimes on the two reaches of the UNFFR. Anglers were acutely aware of the whitewater boating study conducted the previous fall, and some were strongly concerned that whitewater "pulse" flows might harm the existing fishery. Discussion during the study often referred to these issues, and may have confounded or at least influenced recreation fishability evaluations.

Although the focus of the study was on recreational fishability (leaving the biophysical issues to other scientists), it was nevertheless important to assess angler attitudes toward some of these issues because of their potential effects on other issue responses. Figure E5.2.8-22—Anglers' Agreement/Disagreement with Fishing/Boating/Biological Issues, summarizes responses to several attitude statements that have implications for biological issues. Responses range from 1=strongly disagree to 7= strongly agree, with neutral responses not shown.

The results listed below suggest several findings.

- A large majority (78 percent) recognize that there could be impacts from whitewater releases; they support studies to understand them before deciding if boating flows are appropriate.
- Anglers appear divided about whether impacts can be minimized to a sufficient degree, and 52 percent agree that whitewater flows could damage the fishery and should never be provided.

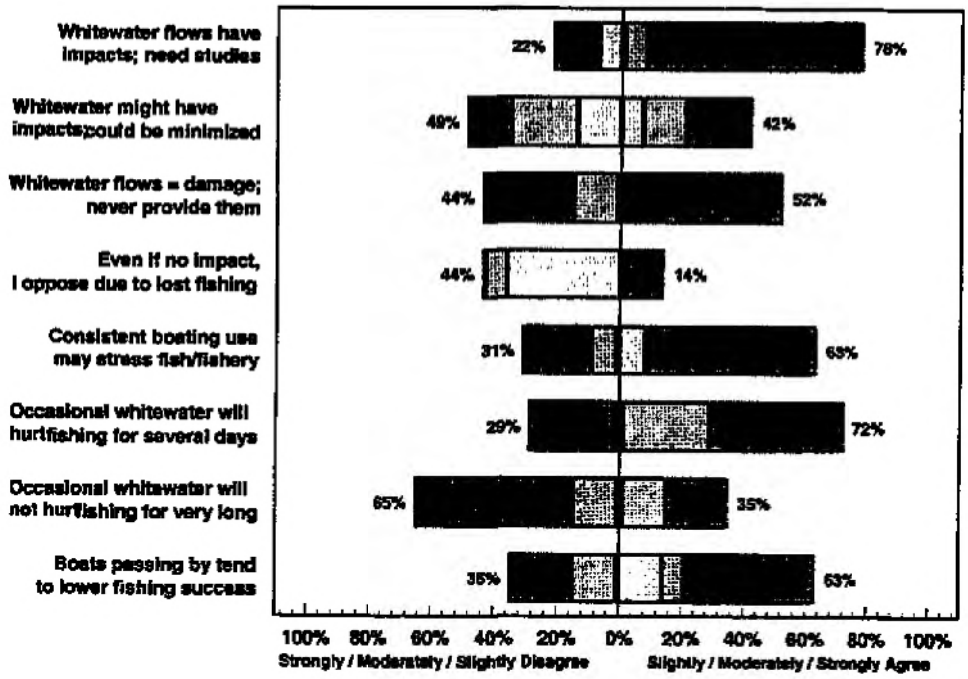


Figure E5.2.8-22
Anglers' Agreement/Disagreement with Fishing/Boating/Biological Issues

- Relatively few anglers (14 percent) oppose whitewater flows because of potential lost days of fishing, as long as biological impacts are not shown. However, most anglers took a neutral position on this statement. Many anglers in the study appeared to be focused on the biological impacts of whitewater flows, not on the impacts on recreational fishing.
- A majority agreed that fishing success rates would drop for several days after whitewater pulses, and most disagreed that whitewater flows would not hurt the fishing for very long. Responses indicate that there is a confounded biological/recreational issue here: anglers are concerned that flows may biologically affect fish and make them harder to catch, even if there are few long-term effects on fish abundance.

- Most (63 percent) anglers also believe that consistent boating use on a river may stress fish and have long-term impacts on a fishery. This is a second biological consideration associated with whitewater use, but it is independent of concerns about excessive flow effects. Results offer more support for the notion that biological considerations may be a factor when anglers evaluate whitewater boating, which may strategically affect evaluations of flow.
- Finally, 63 percent believe that boating lowers the chances of catching fish, offering another reason for the potential opposition to boating flows and representing a confounded biological/recreational issue.

Taken together, results suggest that about half of the anglers in this study would be skeptical of biological study findings that suggest whitewater pulse flows could have minor biological effects, or even help the fishery, if provided during certain times of the year. They also suggest that a majority of anglers are concerned that whitewater flows might have short-term impacts on fishing success (immediately following a pulse release), long-term effects from regular boating use, and immediate effects on fishing success when boats pass anglers. These results highlight the complexity of attitudes, and the ways that perceptions about recreational and biological issues may jointly affect evaluations of whitewater flows or boating.

Some anglers in the study were clearly opposed to whitewater boating from the start. As fish habitat and fishability study results become available and whitewater boating flow requests are assessed, some of these anglers may modify their positions.

However, there are also likely to be some with more resistant attitudes toward boating flows for some or all of these reasons. These data suggest that there are complex attitudes toward boating which may help explain those positions.

Fishing and Boating Use Conflicts

A series of attitude-related questions were also asked about the affect of boating or whitewater flow on fishing, aside from the biological concerns, as well as about preferences for different types of interactions between boaters and anglers on UNFFR reaches. Responses are provided in Figure E5.2.8-23—Anglers' Agreement/ Disagreement with Fishing and Boating Conflict Statements, and Figure E5.2.8-24—Anglers' Agreement/Disagreement with Statements Regarding Interaction with Boaters (responses ranged from 1=strongly disagree to 7= strongly agree, with neutral responses not shown). The results listed below suggest several general findings.

- About half of the anglers were unsure whether whitewater flows would be fishable (neutral response), but of those with an opinion, more believed that whitewater flows would not be fishable. In contrast, about 57 percent thought there might be some flows that would be both fishable and boatable. Some overlap is evident, but optimal ranges for these activities are generally exclusive.

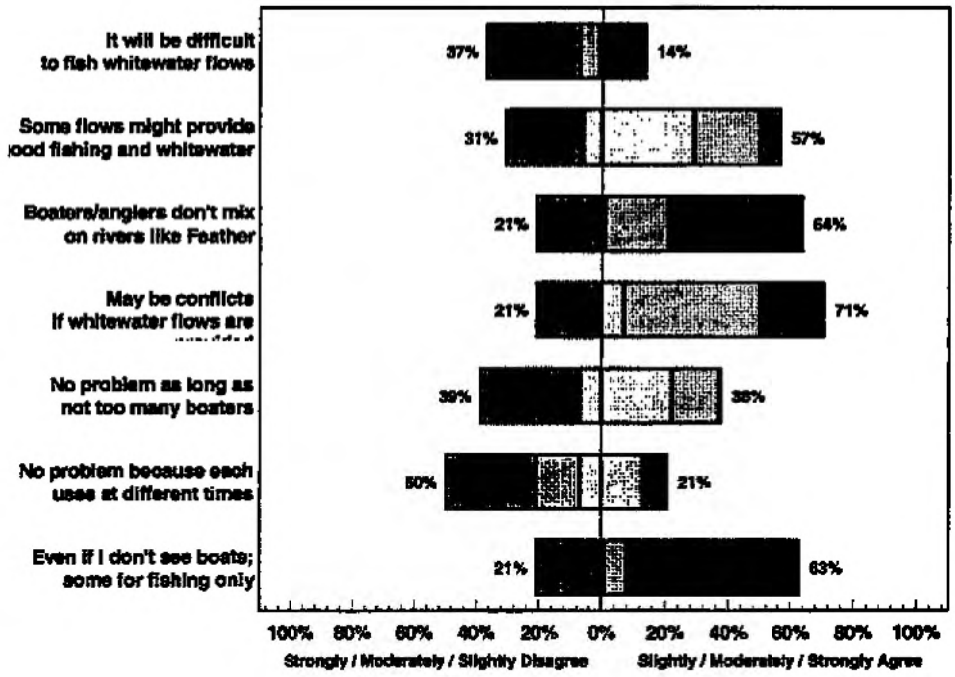


Figure E5.2.8-23
Anglers' Agreement/Disagreement with Fishing and Boating Conflict Statements

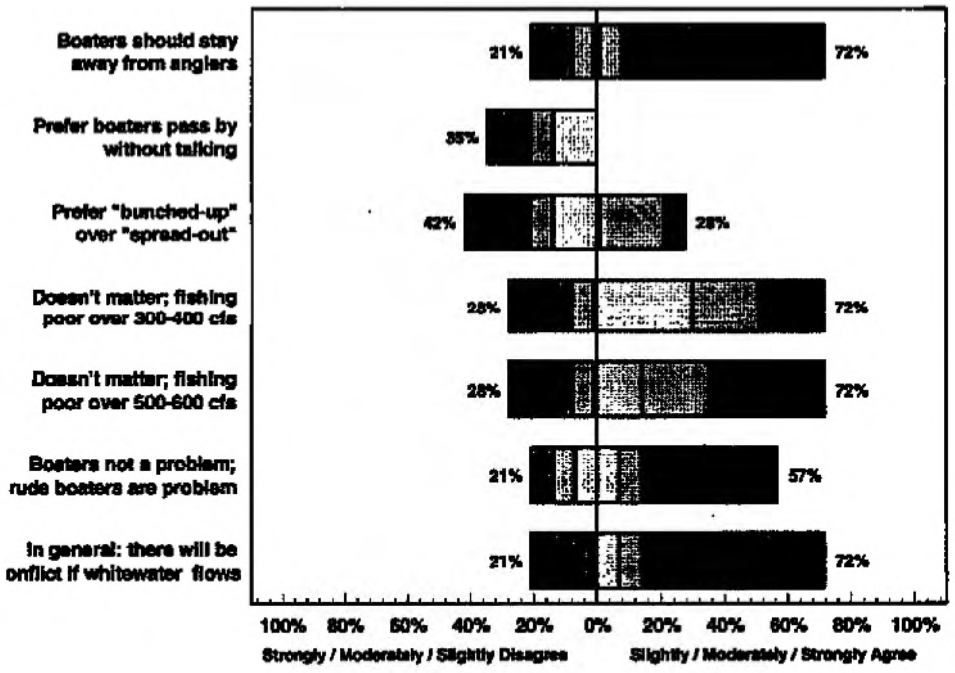


Figure E5.2.8-24
Anglers' Agreement/Disagreement with Statements Regarding Interaction with Boaters

- A majority agreed that boating and angling do not mix on small rivers like those in the Project area. Even larger majorities (71 and 72 percent) felt there would be problems between boaters and anglers, or that a conflict would emerge, if whitewater flows were provided.
- Anglers were roughly divided over whether conflicts would be worse if the numbers of boaters was high, but a majority thought discourteous behavior by some boaters would exacerbate any conflicts in comparison with just the mere presence of boaters. These results suggest that education about boater/angler interaction might help reduce some conflicts.
- A majority of anglers disagreed that zoning activities by time (boaters in mid-day; anglers in mornings and evenings) would solve potential conflicts between the two groups. It is unclear if this is because anglers assume boating flows would be provided all day or whether they assumed both groups would utilize the same flow at the same time.
- Responses to four other questions about whether anglers would fish boating flows over 300 and 500 cfs (Seneca) or 400 and 600 cfs (Belden) suggests anglers generally presumed that boating flows offer poor fishing and thus preclude simultaneous use of the river by both groups. In general, this presumption appears accurate.
- A majority of anglers agreed that some rivers should be "fishing only," even if they had not personally encountered boaters. This suggests that at least some boater antipathy is based on "social values conflict" (Vaske et al. 1995).

Zoning mechanisms (either by space or time) are unlikely to offer useful solutions in these cases (i.e., anglers in this category may still oppose them).

- In the case of actual boater/angler interactions, anglers generally prefer boaters to stay as far away as possible (arguably a difficult thing to do on a small stream like the Feather) and travel in groups that were bunched-up rather than spread-out, to minimize disturbances. Anglers were generally divided (most chose a neutral response) about whether boaters should talk to anglers as they pass.

E5.2.8.4.4.6 Regional Fishing Assessment

As with boaters, anglers were asked to compare the Belden and Seneca Reaches with other rivers in the area, state, and western US to provide a general assessment of their quality. Results are given in Figure E5.2.8-25—Anglers' Rating of Belden and Seneca Reaches Compared to Other Rivers, and suggest that anglers consider the two reaches even less outstanding for fishing than boaters considered them for boating. Only 33 percent thought Seneca Reach was either better than average or excellent compared to other northern California rivers, and none reported the same for Belden Reach. Results were similar at the state and western regional levels, although 14 to 17 percent noted that Belden Reach was, relatively speaking, better than average.

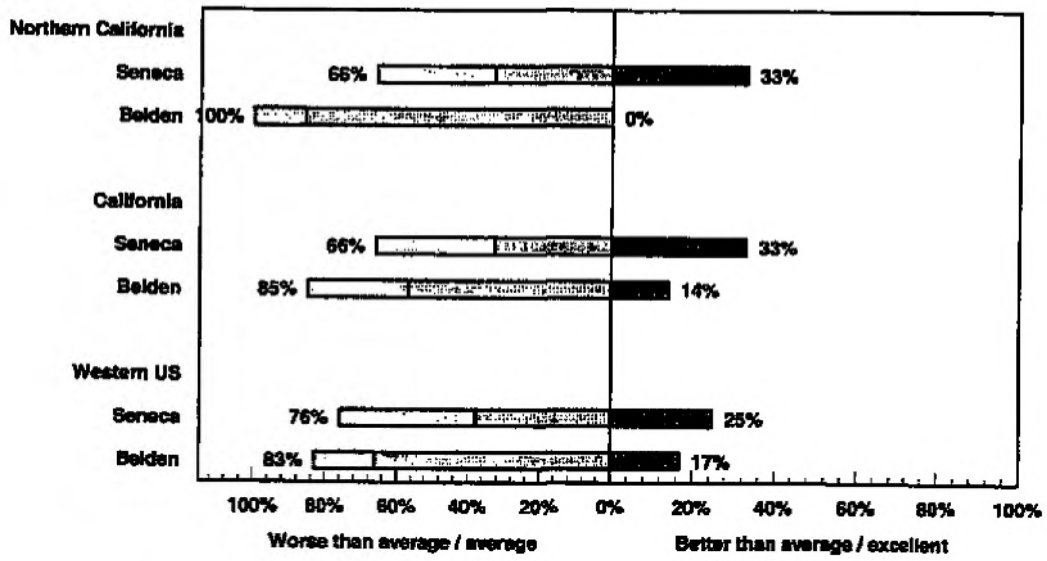


Figure E5.2.8-25
Anglers' Rating of Belden and Seneca Reaches Compared to Other Rivers

E5.2.8.4.4.7 Findings and Discussion: Other Recreational Opportunities

This section provides brief discussions of flow needs for other river recreational opportunities, including swimming, tubing, and general riverside recreation (camping, picnicking, etc.). Results are based on professional judgments, informal interviews with campground hosts and recreation users during fieldwork, and limited fieldwork measuring depths in potential swimming pools.

Swimming

Swimming appears to be a common recreational opportunity along Belden Reach in a few pools near campgrounds; it does not appear to be a significant activity on the steeper, smaller Seneca Reach. The most heavily-used pool on Belden Reach is located at North Fork Campground (based on interviews with campground hosts).

This is designated as a no fishing zone during summer months to reduce conflicts between anglers and swimmers. Use occurs most commonly during the three warmest months (June through August) and is typically focused on wading and water play by children and family groups.

Typical deepest depths in this pool during the 140 cfs base flows are about 3 feet (according to the campground host who lives adjacent to the pool). At 300 cfs (during the fishability controlled flow study), deepest depths were closer to 4.5 feet. Velocities at 140 cfs appeared well less than those at 300 cfs, but the higher flow still obviously constituted a pool that presented few safety hazards for children. By 700 cfs, however, the pool appeared more run-like, and probably would present safety concerns for smaller children at this level.

The campground host reported a preference for the 300 cfs level experienced during the flow study, suggesting that swimmers would enjoy the greater depths and larger pool compared with base 140 cfs flows. However, it was noted that most campers were not focused on swimming; this was a primary activity for a small percentage of campground visitors.

Taken together, information suggests that flows from about 150 to 350 cfs are probably optimal for swimming. Higher flows in this range might significantly decrease water temperatures, which might limit the amount of time people swim.

Tubing

During summer, some family groups on Belden Reach may tube short sections of the river, particularly near campgrounds. The campground host reported seeing them on occasion, but that use was sporadic. She was not sure which reaches might see higher levels of this type of use.

Based on flows experienced during both controlled flow assessments, it is estimated that safe and enjoyable tubing could occur from about 150 to 250 cfs over short sections of the reach. At lower flows, tubing would only be possible in the deeper pools (most of which are less than 50 feet-long). At higher flows, tubers without PFDs (which are rarely worn by people engaged in this activity) might face significant safety hazards in hydraulics over the entire run. Heavy blackberry vegetation would make the consequences of swimming generally unpleasant. The lower gradient areas near campgrounds are probably tubable at flows in the 250 to 450 cfs range, but these flows are still swift and require a level of maneuverability that tubes do not typically provide.

General Riverside Recreation

Camping, hiking, picnicking, and general recreation occur at several defined locations on both reaches, but the heaviest use is associated with campgrounds on Belden Reach. These recreational activities are generally flow-enhanced rather than flow-dependent, so flow levels have few direct effects on quality. An exception would be the negative impact associated with the aesthetics of a dry or nearly dry channel.

Other flow aesthetics studies have shown that as long as flows cover a substantial part of the bottom of a channel, additional water often offers relatively little improvement in conditions (Shelby and Whittaker, in press).

Existing base flows on either reach (140 cfs in summer and 60 cfs in winter on Belden; 35 cfs on Seneca) appear to offer adequate aesthetic quality for most of these activities, although a slightly higher base flow might improve those ratings somewhat for Seneca Reach, where 35 cfs is not always sufficient to cover the bottom of the channel.

E5.2.8.5 Integrating Findings and Conclusions

The preceding discussion described the flow ranges when different opportunities are considered acceptable and optimal, and recommended potential "threshold flows" to be provided when certain opportunities are to be provided. Integrating information, Table E5.2.8-17 reviews recommended flows for all opportunities on the two reaches. Results suggest that while some opportunities have similar flow needs (e.g., different types of boating), others fill different niches in the hydrograph (e.g., fishing and boating).

Overall, information from Table E5.2.8-17 suggests that variation of the hydrograph through the year would provide a greater diversity of high quality recreation than current regimes. Under existing operating conditions, these reaches feature relatively static base flows, with occasional, unpredictable pulses associated with facility maintenance or floods and spills.

Table E5.2.8-17
Summary of Flows for Recreational Opportunities on Belden and Seneca Reaches

Reach/Opportunity	Flow (cfs)	Comment
Belden Reach		
Aesthetics/General Recreation	60/140	Winter and summer base flows
Fly and Acceptable Spin-/Bait-fishing	175	If one flow provided
Optimal Fly and Spin-/Bait-fishing	150/250	If two flows provided
Tubing	200	Short reaches upstream of campgrounds
Swimming	250	Pools near campgrounds only
Tubing	250	Short reaches near campgrounds
Standard Kayaking	600	If one flow provided
Standard Kayaking and Rafting	750	If one flow provided
Challenge Boating	850	If one flow provided
Standard and Challenge Kayaking	600/850	If two flow provided
Standard and Challenge Kayaking/Rafting	700/900	If two flows provided
Seneca Reach		
Aesthetics/General Recreation	50	Higher than current base flow of 35 cfs
Fly and Spin-/Bait-fishing	125	If one flow provided
Fly and spin/bait-fishing	100/200	If two flows provided
Kayaking (initial years)	400	If one flow provided
Kayaking (after run becomes known)	450	If one flow provided
Kayaking (initial years)	350/450	If two flows provided
Kayaking (after run become known)	400/500	If two flows provided

Source: EDAW, Inc.

In general, the existing flow regime provides optimal fishing opportunities and sub-optimal swimming conditions on Belden Reach; on Seneca Reach, current flow regimes provide sub-optimal but acceptable fly-fishing opportunities.

If the Licensee and stakeholders are interested in increasing the diversity of recreational opportunities, periods of higher flow releases will be necessary. Additional necessary considerations relate to scheduling releases to maximize recreational value while minimizing effects on other recreational opportunities and ecological resources, as listed below.

- As discussed in Sections E5.2.8.4.1 and E5.2.8.4.3, boating flows on either reach are considerably more valuable if they occur at times of the year when other whitewater trips are fewer. Summer and early fall releases for whitewater would be preferable for boaters. Boaters would also prefer to have releases scheduled on weekends, for obvious reasons.
- Anglers use the river throughout the fishing season, but higher use levels may occur during summer weekends, setting up potential conflicts with boaters. As data in Section E5.2.8.4.4.5 show, whitewater releases would generally diminish the quality of fishing at those times, and many anglers also reported that whitewater releases would diminish fishing for several days afterward.
- There is likely to be less impact on fishing from providing whitewater flows on Seneca Reach compared to Belden Reach. Whitewater flows on Seneca are only about twice as high as optimal fishing flows, and they are well below historically (pre-Project) high flows. While most fly anglers probably would not fish during whitewater releases on Seneca Reach, spin/bait anglers could fish those whitewater flows, and the ecological impacts would likely to be less. On Belden Reach, whitewater flows are 3 to 7 times larger than optimal fishing flows.
- Many anglers tend to fish more often in the early mornings and late evenings, so shortened mid-day whitewater flows (e.g. from 10 am until 4 pm) would have less impact than if whitewater releases were provided for an entire day (e.g. from 8 am to 8 pm).

While ramping rates would extend these periods somewhat, shortened daily releases could minimize the loss of fishing opportunities and lost power generations, particularly on Seneca Reach where ramping periods can be smaller (because the flow is not high relative to base flows).

- Swimming and tubing are both warm weather-dependent (June through August), and would be affected by whitewater flows.
- When integrating recreation information with ecological flow needs, considerable attention is likely to focus on designing whitewater releases to mimic natural high flow events (pre-Project) and thus serve various ecological purposes. Historically, of course, these types of higher flow events occurred in winter and spring. As noted previously, while some boaters would use UNFFR reaches at those times of year if flows were provided, many other rivers are also available, so use levels are likely to be less.

In conclusion, providing a diversity of recreational opportunities on these two reaches is likely to be challenging. Providing flows for one opportunity may cause some loss in the number of days for another. Ecological resources will also be affected by any change in the flow regime, although it is likely that several fish and riparian resources would be improved by some well-timed higher flow releases. Finally, hydropower generation ability would be affected by potential changes in the flow regime meant to provide greater recreation diversity.

E5.2.9 Recreation Needs Analysis Synthesis

E5.2.9.1 Introduction

This section presents the results of the Recreation Needs Analysis Synthesis, one of several studies that were conducted by the Licensee for relicensing.

E5.2.9.1.1 Objectives of the Study

The objectives of this study were to identify existing public recreation needs and to project future needs according to increments of time over the term of the new license. Needs are assessed for both existing and potential developed public recreation facilities and undeveloped dispersed sites within the Project area. Identification of such public recreation needs does not commit the Licensee to act as the sole entity responsible for satisfying them.

Potential implementation of actions to address existing and future public recreation needs should consider maintaining the existing natural setting of the study area as well as providing a balance between development and natural open space. Maintaining the natural setting of the Project area is an important issue for both local residents and visitors, as well as resource managers.

This study is a synthesis of the results of several previous recreation studies conducted as part of the Licensee's relicensing process, including information presented in the analyses listed below.

Recreation Demand Analyses

- Section E5.1.1—Regional Recreation Assessment;
- Section E5.2.2—Existing Recreation Use Study;
- Section E5.2.3—Reservoir Boating Study;
- Section E5.2.4—Projected Recreation Use Analysis; and
- Section E5.2.8—Whitewater Boating Study.

Recreation Supply Inventory Analyses

- Section E5.1.1—Regional Recreation Assessment;
- Section E5.1.2—Recreation Facility and Condition Inventory;
- Section E5.1.3—Recreation and Public Use Impact Assessment;
- Section E5.1.4—ADA Accessibility Study; and
- Section E5.2.6—Shoreline Day Use Public Access Analysis.

Recreation Capacity and Suitability Analyses

- Section E5.2.5—Recreation Carrying Capacity Analysis;
- Section E5.2.6—Shoreline Day Use Public Access Analysis; and
- Section E5.2.7—Recreation Suitability Analysis.

Results from this study and those listed above will be used in the development of the Draft Recreation Resource Management Plan (Draft RRMP) between the draft and final license application in 2002.

E5.2.9.2 Study Area

The study area includes two groups of recreation facilities (see Figures E5.1-1 through E5.1-3) and use areas (Level 1 and Level 2). For Level 1 recreation sites and use areas, more detailed analyses of recreation needs were conducted. These sites are generally located within and adjacent to (0.25 mile) the Federal Energy Regulatory Commission's (FERC's) project boundary and can be assumed to be in the Project's area of influence. Level 1 sites are listed below.

- Lake Almanor Campgrounds (Loops 1, 2, and 3) (Licensee);
- Camp Conery Group Camp (Licensee);
- Canyon Dam Day Use Area (DUA) (Licensee);
- Almanor Scenic Overlook (Licensee);
- Eastshore DUA (Licensee);
- Last Chance Campground/Group Camp (Licensee);
- Ponderosa Flat Campground (Licensee);
- Alder Creek DUA/Boat Launch (Licensee);
- Cool Springs Campground (Licensee);
- Belden Rest Stop (State Route [SR] 70) (Licensee);
- Almanor Campground (United States Forest Service [Forest Service]);
- Almanor Boat Launch (Forest Service);
- Almanor Beach (Forest Service);
- Dyer View DUA (Forest Service);
- Canyon Dam Boat Launch/DUA (Forest Service);
- Almanor Rest Area (SR 89) (Forest Service);

- Gansner Bar Campground (Forest Service);
- North Fork Campground (Forest Service); and
- Queen Lily Campground (Forest Service).

For Level 2 recreation sites and use areas, less detailed needs analyses were conducted for private resorts, private shoreline homes, and dispersed use areas. Level 2 sites and use areas include:

- 19 private commercial resorts, which have a mix of boat launches, marina/slips, and overnight facilities (cabins, RV sites, etc.), plus other country club and community club facilities;
- Lake Almanor shoreline residential boat launches and boat docks/slips (private); and
- Public, Licensee, and other private dispersed (undeveloped) lakeside (Lake Almanor and Butt Valley Reservoir) and riverside (Belden and Seneca Reaches) day use and overnight sites.

Private recreation facilities (see Figure E.5.1-3) are considered as part of the mix of available recreation opportunities in the Project area. However, the needs associated with private resorts and other facilities not addressed in this report.

E5.2.9.3 Methods

This study synthesizes previous study results into a single report that analyzes, identifies, and projects existing and future public recreation needs in the study area.

The methodology was comprised of three parts:

- An analysis of overall "big picture" recreation needs over time (i.e., extent of new public facilities that might be needed during the term of the new license (assumed to be 30 years for the purposes of this study) versus more focused public needs on site-by-site bases).
- Identification of focused public recreation needs on site-by-site bases, both existing (current to 2005) and future (2005 to 2035, in 10-year increments), including developed public recreation facilities and undeveloped dispersed recreation sites;
- Development of Project-related public recreation needs criteria to be considered during the relicensing process and development of the Draft RRMP in 2002.

Many different types of sites, facilities, and use areas associated with various public recreation activities were considered in this analysis. Public facilities and sites related to the activities listed below were considered.

- RV and tent camping (at developed and dispersed shoreline sites)
- Day use/picnicking (at developed facilities and dispersed shoreline sites)
- Boating
- Swimming and sunbathing
- Visiting interpretation and education (I&E) facilities/programs/signs
- Non-motorized trail use (including hiking, walking, mountain biking, and equestrian use)

- Fishing (boat and bank)
- General use of open space (including hunting and wildlife observation/ photography)

E5.2.9.3.1 Assessing Overall Recreation Needs

Overall "big picture" public recreation needs were assessed by comparing and contrasting a number of demand, supply, capacity, and opportunity/constraint factors or indicators to arrive at conclusions. Existing data (see Section E5.2.9.1) for the study area from the demand, supply, capacity, and suitability analyses were used for this purpose. In addition, input from agencies and other stakeholders, as well as other published studies, was considered.

This component focused on the "big picture" need for various types of facilities or opportunities, without specifying where or how such needs might be met. The assessment considered both developed and dispersed undeveloped recreation sites and use areas.

With respect to existing facility utilization, several capacity threshold indicators were considered in this study to assess seasonal (mid-May through mid-September) and peak months (July and August) facility use. As discussed in Section E5.2.5—Recreation Carrying Capacity Analysis, a recreation facility may be considered to be at capacity for planning purposes when utilization reaches: 60 percent for the standardized season; 80 percent for the peak months of July and August; and 15 percent of the days during the

season it exceeds 90 percent occupancy. These indicators are refined in the Draft RRMP. Projected utilization beyond these percentages may represent demand that is in excess of capacity for planning purposes. This method was used to determine the projected number and type of facilities (campsites and picnic tables for example) that would likely need to be provided in the future in order to meet projected demand. It should be noted that all projected facilities may not necessarily be constructed due to changing conditions over time, such as resource constraints or changing visitor values. However, these projections are the best available ones at this time.

A number of inter-related factors are considered in this overall needs analysis. These include recreation facility occupancy, visitor survey responses, facility conditions, and agency and user consultation. Sources of data for these factors include:

- Recreation visitor survey responses;
- Visitor perceptions of crowding and crowding criteria;
- Projected increases in demand for various activities;
- Seasonal and weekend occupancy rates;
- Facility and use area capacity utilization;
- Physical and spatial arrangement of existing facilities and use areas;
- Existing facility conditions and accessibility guidelines and report recommendations;
- Suitability analysis depicting potential sites or areas;
- Opportunities for infill, redesign, or expansion of existing facilities;
- Management goals and objectives of published plans;

- Visual observations and observed impacts from existing use;
- Published study results;
- Professional judgment; and
- Input from agencies and other stakeholders including comments on the draft license application.

Public recreation-related needs in the study area were projected into the future for a significant portion of the anticipated term of the new license (assumed to be 2005 to 2035 for planning purposes). This analysis was performed by comparing National as well as California Statewide Comprehensive Outdoor Recreation Plan (SCORP) projected increases in activity participation to the current utilization of various public recreation sites and facilities. For projected activity use trends in the future, projections developed by Cordell were used and were compared with SCORP historical activity trends. Where there were no activity projections available from Cordell, SCORP historical trends were used for future projections.

This procedure was used to project the number of public campsites, picnic tables, and boat launches that would be needed to meet projected future demand. Overall needs are further broken down by site in Section E5.2.9.4.2.

In practice, recreation use will need to be monitored over time because of various factors that may affect visitors' use levels over the new license period (endangered species listings; facilities coming on/off line; management actions by adjoining property resource

managers; changes in technology; weather and drought conditions; natural disasters; economic conditions; and visitors' preferred activities and settings).

E5.2.9.3.2 Methodology for Identifying Recreation Needs by Site

The overall analysis described above looked at the broader context of needs within the study area, generally by activity type. This section considers these broader needs concurrently with other known existing needs at each site, and also identifies where they may be accommodated on a site-by-site basis, in conjunction with information from Sections E5.2.5—Recreation Carrying Capacity Analysis, Section E5.2.6—Shoreline Day Use Public Access Analysis, and E5.2.7—Recreation Suitability Analysis. Developed and dispersed sites are considered, as well as both private and public facilities. However, the emphasis of this analysis is clearly on public recreation areas and facilities, as per FERC guidelines. Site-specific needs are identified through review and analyses of several data sources, including:

- Recreation survey responses about specific sites;
- Occupancy rates at specific sites with a 60 to 80 percent theoretical capacity utilization and the number of days/times that seasonal occupancy rates exceeded 90 percent;
- Spatial arrangement of sites and design problems observed;
- Facility conditions and maintenance needs;
- Accessibility compliance and guideline recommendations at sites;
- Potential sites as identified in the GIS-based suitability analyses;
- Opportunities for infill, redesign, or expansion at each site;

- Observed impacts of use at each site;
- Published study results;
- Professional judgment; and
- Agency and other stakeholder input and comments on the draft license application.

The identification of future recreation needs was derived from a list of existing (defined as current to 2005) site-specific needs. This analysis projected recreation needs into the future (2005 to 2035) in 10-year increments. Where new recreation facilities may be under consideration to help satisfy demands, their anticipated implementation phases were projected. The primary indicators used to define future need for developed facilities were: projected increases in demand over 30 years, and anticipated capacity; these needs were estimated for each developed facility, use area, and activity type. Existing needs, and future use projections (see Section E5.2.4—Projected Recreation Use Analysis and Section E5.2.5—Recreation Carrying Capacity Analysis) were considered.

E5.2.9.3.2.1 Assessing Recreation Facility Accessibility

Americans with Disabilities Act (ADA) accessibility needs (see Section E5.1.4) were also identified on a site-by-site basis. The ADA, signed into law in 1990, protects individuals with disabilities by specifying that adequate access to facilities be provided including to recreation facilities. In 1991, ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) was published. ADAAG specifies guidelines, not standards, for designing or retrofitting facilities, including recreation facilities. Draft proposed

ADAAG guidelines are being developed and published for public comment between 1998 and 2002. These new guidelines will provide design standards and technical criteria regarding the mandate to provide ADA-accessible facilities at recreation areas in the United States.

E5.2.9.3.3 Criteria for Assessing Project-Related Recreation Needs

Not all needs identified in the study area or during site analyses should be assumed to be Project-related. Determining whether or not recreation needs are Project-related entails consideration of various criteria. For the purposes of this analysis, a few criterion were identified, based on previous relicensing projects involving federal agencies, such as the Forest Service. The analysis did not attempt to apply the criteria to the list of needs, but rather described them for later application by agencies or other stakeholders.

E5.2.9.4 Results and Discussion

Results and conclusions from this study are organized in three sections. Section E5.2.9.4.1—Overall Recreation Needs in the Study Area presents existing and future public recreation needs based on activity type. Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site specifically identifies needs at individual public recreation sites including developed facilities and dispersed undeveloped sites. Section E5.2.9.4.3—Project-Related Needs Criteria presents the criteria used to assess whether specific needs identified throughout this document might be considered by the Licensee as potential enhancements.

In addition to studies and reports generated as part of this study, several other published reports and stakeholder comments were incorporated into the Needs Analysis.

These reports included Forest Service documents (Forest Service 1994 [Simcox] and 1995, and *Red Bluff Daily News* 2001), a Chico State University recreation concept development plan (CSU 1990), and two Plumas County reports (Plumas County 1995 and 2002a). Each of these documents recommended specific recreational facility and site improvements in the study area, many of which were also identified by the current recreation studies.

E5.2.9.4.1 Overall Needs in the Study Area

This section provides an analysis of overall "big picture" public recreation needs within the study area by facility, activity, use area, or program type. Recreation resources analyzed include those identified in Section E5.2.9.3. Factors or indicators considered are organized into four categories: supply, demand, capacity, and suitability. Based on a comparison and review of these factors and professional judgment, as well as input from agencies, other stakeholders, and published reports, conclusions are presented for overall existing and future public recreation needs in the study area. Site-specific needs are further addressed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Activities examined below include overall needs for:

- Camping (RV and tent; developed facility and dispersed undeveloped shoreline camping)

- Day use/picnicking (developed facility and dispersed undeveloped shoreline day use)
- Boating
- Swimming/sunbathing
- Interpretation and education
- Non-motorized trail use
- Fishing (boat and bank)
- General open space activities (hunting and wildlife observation/photography)
- Whitewater river boating and fishing
- Resource protection and visitor management and safety related to recreation activities

E5.2.9.4.1.1 Overall Camping Needs in the Study Area

Overall public camping supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. Camping needs analyzed in the study area include:

- Developed RV and tent campgrounds.
- Dispersed undeveloped campsites (including boat-in campsites).

Camping Supply Factors

Important public camping supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail and Figure E5.1-

1—Licensee and Forest Service Public Recreation Sites in the UNFFR Study Area for the location of recreation sites and facilities in the study area).

- There are a total of approximately 382 developed public campsites in the vicinity of the study area operated by the Licensee and the Forest Service. Of these, the Licensee provides 234 campsites (61 percent) at four campgrounds in the study area. The remaining 148 campsites (39 percent) are provided by four Forest Service campgrounds (Almanor Campground (North and South), Queen Lily Campground, North Fork Campground, and Gansner Bar Campground) within the study area.
- Two of the campgrounds operated by the Licensee in the study area are located on Lake Almanor (Lake Almanor Campground [Loops 1, 2, and 3] and Last Chance Campground), while the remaining two campgrounds are located on Butt Valley Reservoir (Ponderosa Flat and Cool Springs Campgrounds). The Forest Service has one campground on Lake Almanor (Almanor Campground [North and South]) and three along the Belden Reach (Queen Lily, North Fork, and Gansner Bay Campgrounds).
- There are two campgrounds with designated group sites in the study area with a total of 23 individual campsites. This includes 10 sites at the Almanor Group Camp and 13 sites at the Last Chance Campground. Additionally, five bunkhouses at Camp Conery Group Camp provide public group reservation camping opportunities for up to 50 people in a cabin setting.
- Developed campsites are available on a fee-only basis. The Licensee charges a $15 per night fee for campsites at the Lake Almanor Campground,

Ponderosa Flat Campground, and Cool Springs Campground. Fees are $13 per night at the Last Chance Campground/Group Campground and $20 per night for a reserved site. Almanor Campground, operated by the Forest Service, charges a $15 per night fee. Fees at the Almanor Group Camp, also operated by the Forest Service, are $75 per night per group. All three Forest Service campgrounds along Belden Reach (Queen Lily, North Fork, and Gansner Bar) have $12 per night fees. At both Licensee and Forest Service public campgrounds, other additional fees apply related to numbers of vehicles, people, and other variables. Fees are subject to change annually.

- There are approximately 50 dispersed shoreline sites surrounding the two Project reservoirs and the two river reaches, some of which are used for dispersed camping. There are 24 or more dispersed sites on Lake Almanor, three on Butt Valley Reservoir, two to four along Seneca Reach, and 20 along Belden Reach.
- There are 16 ADA-accessible campsites in the study area. Many of these facilities, however, needed to be retrofitted.
- Overall, most of the recreation elements at Licensee and Forest Service campgrounds in the study area are in good condition. However, some maintenance is needed at several facilities at Lake Almanor, Butt Valley Reservoir, and along the two Project river reaches. Picnic tables, fire rings, and water faucets are the primary campsite elements that are in need of maintenance at study area campgrounds. Some facilities also need repair or replacement, such as older toilets.

- The Forest Service has developed plans to renovate the Almanor Campground, and associated overflow and group camping areas (Forest Service 2001b and 1994). The goals of the renovation project are to improve campsite spurs, create ADA-accessible sites, pave trails, renovate the amphitheater, and replace older toilets. These plans are expected to be funded in a 2006 Forest Service Capital Improvement Program (CIP) project.
- In addition to public camping facilities, there are approximately 30 private recreation facilities of varying types at Lake Almanor (see Figure E5.1-3). Most of the private facilities on Lake Almanor are located in the peninsula region, with a concentration in the Big Cove area. Other private recreation facilities are located on the eastern and southern shorelines of the reservoir. Nineteen of these facilities are private resorts open for general public use.
- Private recreation facilities at Lake Almanor are generally more densely developed than Licensee and Forest Service public facilities. In addition to facilities and services commonly offered at Licensee and Forest Service public recreation sites (e.g., tent campsites, boat launches), private recreation providers also offer such amenities as RV hookup campsites, rental cabins, condominium rentals, and boat moorage and gas.
- Private recreation facilities play an important role in providing recreational opportunities at Lake Almanor and satisfy a large portion of the recreation demand in the study area, especially for visitors seeking a more developed recreation experience. Many of the private recreation facilities on Lake Almanor are open to the general public, although a fee must be paid for use of

the facilities (boat launches at resorts), and the rules at each private resort may vary. Other private recreation facilities, though, are closed to the general public (residential communities with shoreline recreation facilities and country clubs).

Camping Demand Factors

Important camping demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use for more detail).

- Over the next 30 years (to 2035), demand for camping is projected to increase substantially: developed camping (45 percent), primitive camping (27 percent), and group camping (45 percent). Campgrounds and sites located in proximity to the water are in highest demand, particularly given the increasing demand for water-based recreation activities in general.
- Generally, demand for camping is highest during the standardized summer recreation season (mid-May through mid-September) when the weather is nice.
- Camping demand at Licensee campgrounds over the last 16 years peaked in 1993, but has been declining or staying relatively steady over the last 8 years. Campground utilization dropped slightly in 2001 by a few percentage points, but is expected to rebound in 2002. The Forest Service has also reported a slight decline in recent years and in 2001.
- Expanding existing public campgrounds or building new facilities can both satisfy existing demand (relieves crowding at existing campgrounds) and can

generate new demand (new facilities create new opportunities and may stimulate use). Key considerations include maintaining or improving the visitor experience while not degrading the ecological and social conditions in the area.

- Of the private recreation facilities that allow public use, 17 agreed to be contacted by researchers and seven (41 percent) provided estimated occupancy rates. The average estimated summer seasonal occupancy (Memorial Day through Labor Day weekends) for the private resorts that reported occupancy data was 91 percent and 72 percent during the timeframe that these facilities were open for business. Considering pool levels at Lake Almanor were comparatively low in 2001 due to a drought and the California energy crisis, an average of 91 percent occupancy for resorts (those that reported use) suggests resorts still did a fair amount of business from Memorial Day to Labor Day weekends. However, some resorts reported a decrease in business while others reported an increase.
- Several operators felt that the 2001 reservoir level negatively affected their business.

Camping Capacity Factors

Important camping capacity factors to consider are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis for more detail).

- Facility Capacity—Facility capacity is the primary limiting factor at most of the public campgrounds in the study area including Last Chance Campground,

Almanor Campground (North and South), Lake Almanor Campground, Camp Conery Group Camp, Cool Springs Campground, North Fork Campground, and Gansner Bar Campground. In 2001, campgrounds were utilized at an average of approximately half (53 percent) of their capacity during the standardized recreation season (mid-May through mid-September). Average peak month (July and August) utilization was at 68 percent. These percentages include both weekday and weekend counts.

Gansner Bar Campground, on Belden Reach, had the highest seasonal utilization rate (64 percent), while Cool Springs Campground had the lowest (35 percent). Lake Almanor Campground had the highest peak month utilization rate (77 percent), while the Last Chance Campground had the lowest (44 percent). Across the study area, Belden and Seneca Reach campgrounds had the highest seasonal occupancy (60 percent), while the Lake Almanor (53 percent) and Butt Valley Reservoir (45 percent) campgrounds had lower seasonal occupancies. Occupancy during peak months (July and August) was highest at Lake Almanor (70 percent). The Project river reaches had the next highest peak month occupancy (67 percent), while Butt Valley Reservoir had the lowest (57 percent) peak month occupancy. These percentages include both weekday and weekend counts.

- Physical/Spatial Capacity—Physical/spatial capacity is a limiting factor at the Lake Almanor Campground and Queen Lily Campground. The potential for future expansion exists at all other developed campgrounds in the study area.

- Social Capacity—The primary indicator of social capacity is visitors' perceptions of crowding (Shelby and Heberlein 1986). Perceived crowding in the study area is relatively modest (3.5 on a 9-point scale) and is considered to be below, but approaching capacity. Perceived crowding at most public campgrounds in the study area is also relatively modest and most campground usage is considered to be approaching social capacity.

  However, crowding scores at three campgrounds, Lake Almanor Campground, Ponderosa Flat Campground, and Queen Lily Campground, are higher (4.2, 4.3, and 4.4, respectively) and indicate users are feeling slightly to moderately crowded. Camp Conery Group Camp (2.4) had the lowest perceived crowding score of all developed campgrounds in the study area. The overall crowding score at Lake Almanor and at Seneca and Belden Reaches was 3.2, indicating that visitors felt "slightly crowded." The overall crowding score for visitors surveyed at Butt Valley Reservoir was lower (2.9).

- Ecological Capacity—Ecological capacity is not considered a limiting factor at most study area campgrounds. Most campgrounds have minimal ecological impacts including some areas of bare ground and soil compaction, some erosion along user-defined trails and the shoreline (wave and wind action), and most down wood has been cleared from around campsites. While ecological impacts at most developed campgrounds are minimal, they could become more significant if campground utilization increases over time. At the same time, bald eagle and other raptor nest sites are considered particular

constraints in the Almanor Campground and Lake Almanor Campground areas.

- Capacity Summary—Campgrounds in the study area are currently experiencing use levels representing varying degrees of capacity utilization. Use is generally approaching capacity at many campgrounds in the study area except for two (Camp Conery Group Camp and Gansner Bar Campground, which are currently exceeding their seasonal capacity).

  While use is approaching capacity at most campgrounds, facility capacity is a limiting factor nonetheless due to a limited number of available campsites at each campground. One of the most important overall conclusions that can be drawn from this analysis is that although campground facilities are often at or approaching capacity, visitors perceive only modest levels of crowding at most sites. This may imply that at most sites visitors have become somewhat tolerant of higher use levels or that a higher level of use is expected as part of the recreation experience at the Project area. At three sites (Lake Almanor Campground, Ponderosa Flat Campground, and Queen Lily Campground), however, social capacity has likely been reached and visitors are feeling somewhat crowded.

Camping Suitability Factors

Important camping suitability factors are summarized below (see Section E5.2.7—Recreation Suitability Analysis for more detail). Several areas were identified as

potentially suitable for additional facility development, including new or expanded campground facilities. These areas were identified on the Recreation Development Suitability maps (Figures E5.2.7-1 — E5.2.7-11) created for the Recreation Suitability Analysis. Significant findings include the following suitable areas for potential camping-related development:

- Catfish Beach (Lake Almanor)—potential primitive day use and campground area (primitive); requires access route across private land.
- Southeast Shoreline Access Zone (Lake Almanor)—2 miles of narrow, mostly high bank Licensee-owned land between the shoreline and SR 147, includes the existing Eastshore DUA (in the middle) and Almanor Scenic Overlook (south end). This area and others will be considered for a new campground and further studied in 2002.
- Camp Conery Group Site (Lake Almanor)—expansion potential may be considered here or next to Canyon Dam DUA.
- Area north of Lake Almanor Campground (Lake Almanor)—expansion potential may be considered.
- Almanor Campground (Lake Almanor)—some expansion potential exists since the Forest Service is planning to relocate its group camp next to the campground and is expecting to perform other renovations at this facility.
- Area south of Lake Almanor West Community Club (Lake Almanor)—Collins Pine-owned land—potential campground/DUA may be considered.
- Three areas/zones on the west shore (Butt Valley Reservoir)—possible boat-in dispersed use sites may be considered.

Overall Camping Needs

Based on a review of the above factors and indicators, overall camping needs and potential options to address these needs have been identified in the study area. These are potential options and should not be assumed to be protection, mitigation, and enhancement (PME) measures. As such, the word "consider" is used throughout this section. Site-specific camping options are discussed in the Recreation Facility and Use Area Needs by Site (Section E5.2.9.4.2) below.

Overall camping needs and potential options to satisfy them may include:

- Consider maintenance and improvements to existing public camping facilities. Facilities at several of the existing public campgrounds are in need of some maintenance, repair, or replacement. This includes toilet/restroom facilities, individual site facilities, and other facilities provided at specific campgrounds. There is high demand at study area campgrounds for shower facilities. Showers may be considered at selected recreation sites where feasible. The location and type of shower should be based on the level of use the site receives. For example, if a campground receives a very high level of use, a shower facility (indoor pay showers) may potentially be provided at the site. On the other hand, if a site receives a lower level of use, simple outdoor showers may potentially be provided. Site conditions at some locations may also preclude showers and leach fields. The Forest Service plans to renovate the Almanor Campground, and associated overflow and group camping areas (Forest Service 2001b and 1994). In addition to general maintenance and repair, the goals of the renovation project are to create ADA-accessible sites,

pave trails, improve internal circulation, improve public access to the shoreline, and generally increase the capacity of the campground. These improvements are planned in a 2006 Capital Improvement Program project.

- Consider increasing the supply of camping facilities to meet current and future demand. Projected demand at individual public campgrounds indicates that additional campsites will likely be needed in the study area to help accommodate future demand. These sites would likely be phased in over a 30-year period (through 2035). Because campground capacity is anticipated to be exceeded in the near future, use should be monitored to determine when new facilities may be constructed or existing ones expanded. A monitoring program will be developed that specifies threshold criteria or indicators. Capacity threshold levels used in this analysis for planning purposes include the following: (1) a 60 percent standardized seasonal capacity utilization level, (2) an 80 percent peak month (July and August) capacity utilization level, and (3) a 15 percent total season days (mid-May through mid-September) operating at 90 percent or above capacity level. These threshold level indicators should be reached or exceeded for a sustained period (3 out of 5 years) before actions are taken due to historic variable conditions from year to year. It is anticipated that new developed campsites should be considered in each recreation resource area (reservoir or river reach) in the study area over the term of the new license assumed (through 2035). The implementation of new campsites will be coordinated with other resources during the relicensing process. Projected needs at individual public campgrounds (specific number

of sites), including a proposed new campground, are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Specific public campgrounds needs are considered below for the following types of sites:

(1) developed Licensee and Forest Service public campgrounds (RV/tent),

(2) group reservation camping facilities, and

(3) shoreline dispersed campsites.

— Licensee and Forest Service campgrounds—Projected demand at individual campgrounds indicates that a total of up to 150 additional new public campsites (RV/tent) or more will be needed in the study area to accommodate future demand through 2035 and still maintain use levels within capacity. Although these sites should be phased in over a 30-year period, consideration should be given to the addition of campsites in the near future as utilization of some campgrounds is already approaching capacity. While a few campgrounds could likely be expanded, consideration may also be given to the creation of a new public campground at Lake Almanor in the future.

A potential new campground on Licensee-owned land may be considered to provide approximately 95 new tent and RV campsites. This new campground could potentially be located on the southeastern shoreline of Lake Almanor. The new campground may include RV and tent campsites, overnight boat moorage, restrooms and showers, a swimming area in a cove, camp host sites, and other amenities similar to existing Licensee

campground facilities. This potential new campground may be phased in between 2005 and 2035, perhaps one campground loop per phase. These dates may vary and would be based on capacity thresholds being reached in the Lake Almanor area per the Draft RRMP.

— Group camping facilities—There are currently two campgrounds (Last Chance Campground and Almanor Campground) with group camping facilities. Additionally, Camp Conery Group Camp is a group camping facility with five bunkhouses that can accommodate groups of up to 50 people. Projected demand indicates that up to three potential new group camping facilities would be needed by 2035. The location of potential new group camping facilities will need to be coordinated with other resource areas, but could potentially be located at Camp Conery Group Camp, Canyon Dam DUA, conversion of the Eastshore DUA, and/or at Butt Valley Reservoir's Ponderosa Flat Campground.

— Shoreline dispersed campsites—There are about 50 shoreline dispersed undeveloped campsites or DUAs in the study area. Demand projections indicate that new shoreline dispersed campsites would be needed to accommodate future dispersed camping demand. The creation of new shoreline sites is limited due to pool level fluctuations, ecological constraints, fire restrictions and concerns, and access. However, the addition of boat-in campsites at Butt Valley Reservoir may be considered. Visitor demand for existing and potential shoreline dispersed campsites should remain high.

- Consider ADA compliance at all existing new camping facilities. As major maintenance or new improvements are made to existing public campgrounds, accessibility may be enhanced utilizing the ADAAG guidelines available at that time. In addition, all new public facilities (including parking areas, tent pads, picnic tables, fire rings, drinking fountains and water faucets, trash receptacles, and paths to other accessible facilities) must adhere to the new ADAAG guidelines. Planned renovations at Forest Service campgrounds, specifically the Almanor Campground, include improvement plans regarding ADA-accessible campground facilities (Forest Service 2001b and 1994). Specific improvements needed at existing campgrounds are identified in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site and in Section E5.1.4—ADA Accessibility Study.

E5.2.9.4.1.2 Overall Day Use/Picnicking Needs in the Study Area

Overall public day use/picnicking supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs.

Day Use/Picnicking Supply Factors

Important public day use/picnicking supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail, and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR study area for the location of recreation sites and facilities in the study area).

- There are seven developed public picnic areas in the study area with a total of 54 picnic tables. Two public campgrounds provide an additional 19 picnic tables for day use. Over half (47) of the picnic tables in the Project study area are located at DUAs at Lake Almanor. All public developed picnic sites in the study area have fire rings or grills.
- There are about 50 dispersed shoreline sites surrounding the two Project reservoirs and river reaches, some of which are used for dispersed day use/picnicking. There are 24 or more dispersed sites on Lake Almanor, three on Butt Valley Reservoir, two along Seneca Reach, and 20 along Belden Reach.
- There are no fees associated with the use of developed Licensee and Forest Service day use/picnicking facilities.
- There are three ADA-accessible picnic tables in the study area, one at the Almanor Beach and two at the Canyon Dam DUA. Additionally, all public day use/picnicking sites have at least one ADA-accessible toilet.
- Overall, most of the recreation elements at Licensee and Forest Service day use/picnicking facilities in the Project area are in good condition. Some maintenance is needed at some of the facilities, primarily to picnic tables, water faucets, cooking grills, and signs. The Forest Service currently has maintenance plans for its DUAs on Lake Almanor that include repairing, replacing, and renovating certain day use site elements (picnic tables, restrooms, parking areas) (Forest Service 2001b and 1994; *Red Bluff Daily News* 2001).

Day Use/Picnicking Demand Factors

Important day use/picnicking demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use for more detail).

- Picnicking is a popular activity at many of the developed day use sites in the study area. At Lake Almanor, survey results (see Section E5.2.1—Questionnaire Survey) indicated that picnicking accounted for nearly a quarter of use at four day use sites including Almanor Beach (27 percent), Eastshore DUA (29 percent), Canyon Dam Boat Launch/DUA (21 percent), and Canyon Dam DUA (23 percent). At Butt Valley Reservoir, 27 percent of use at the Alder Creek DUA/Boat Launch is attributable to picnicking.
- At Belden Rest Stop (SR 70), the only developed DUA located along Project river reaches, visitors use the facility primarily as a rest stop. However, picnicking also accounts for 65 percent of use according to visitor responses. The remaining picnicking along Project river reaches occurs primarily in dispersed use areas along Belden Reach. Picnicking was one of the most popular activities at the following dispersed areas: the area to the north of Gansner Bar Campground (30 percent), the area from North Fork Campground to Queen Lily Campground (33 percent), and the area from Queen Lily Campground to Belden Forebay (26 percent).
- Demand for picnicking is increasing as the population of areas of visitor origin continue to increase. The annual increase in demand for picnicking based on a regional study (Cordell 1999) is 1.05 percent per year. By the year 2035, picnicking is projected to increase by 44 percent.

- Overall visitation and demand for picnicking facilities is variable and weather dependent. If the weather is poor, DUA occupancy declines considerably, even during weekends and holidays.
- Unlike campgrounds, day use facilities are generally used on weekends, for shorter periods of time (a few hours or less), and typically during good weather conditions (picnicking, swimming, and sunbathing require warm, sunny days) at peak times. As a result, capacity utilization of day use facilities, such as picnic areas, tends to be lower compared to campgrounds. These sites are typically vacant or lightly used during much of the year, with the exception of warm, sunny days when they are more heavily utilized. The primary concern is to have adequate parking and other facilities for these briefer peak periods of time.
- A component of demand is the additional use that could potentially be induced by the expansion or construction of new facilities. Thus, while new facilities would help meet existing demand, they may also generate new demand. Key considerations include maintaining or improving the visitor experience and building new facilities only up to sustainable levels.
- Demand for rest stops, such as Belden Rest Stop (SR 70) and Almanor Rest Area (SR 89), can be estimated by examining demand for sightseeing. Sightseeing is projected to increase 1.31 percent per year. By 2035 sightseeing is projected to increase by approximately 58 percent. Use of these facilities is for very brief periods of time.

Day Use/Picnicking Capacity Factors

Important day use/picnicking capacity factors to consider are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis for more detail).

- Facility Capacity—Facility capacity was a limiting factor at all of the public day use facilities, except one (Almanor Scenic Overlook). The number of available parking spaces is the most common facility capacity issue at public day use facilities in the study area. In total, public DUAs (including boat launches) in the study area were utilized at approximately 54 percent of capacity during the 2001 season. Canyon Dam Boat Launch/DUA had the highest seasonal capacity utilization (99 percent), while Belden Rest Stop (SR 70) had the lowest (14 percent). Canyon Dam Boat Launch/DUA also had the highest peak month capacity utilization (113 percent), while the Almanor Scenic Overlook had the lowest (17 percent).
- Physical/Spatial Capacity—Physical/spatial capacity is only a limiting factor at two day use sites, Almanor Scenic Overlook and Belden Rest Stop (SR 70). Physical/spatial capacity is also a limiting factor at undeveloped dispersed sites due to topography and the limited number of suitable shoreline sites.
- Social Capacity—Social capacity is not a limiting factor at day use facilities in the study area, as visitor perceptions of crowding are relatively low. Almanor Beach had the highest (3.4) perceived crowding score (scale of 1 to 9), while Canyon Dam DUA had the lowest (2.2). Additionally, all public DUAs, except one (Almanor Beach), had perceived crowding scores under 3.

- Ecological Capacity—Ecological capacity is only considered a limiting factor at one day use/picnicking site in the study area, the Almanor Rest Area (SR 89). This site displays moderate ecological impacts mostly from unconfined vehicle and pedestrian traffic. At the same time, bald eagle and raptor nest sites should be considered at the Almanor Beach Area.
- Capacity Summary—Of the eight day use recreation sites assessed in this analysis (not including the two boat launches), use levels at most of the sites were below or approaching capacity. Overall, capacity was exceeded at Alder Creek DUA/Boat Launch.

Day Use/Picnicking Suitability Factors

Important day use/picnicking suitability factors are summarized below (see Section E5.2.7—Recreation Suitability Analysis for more detail). To meet future demand, several developed and dispersed areas were identified as highly suitable for additional facility development, including new or expanded picnicking facilities. These are identified on the Recreation Development Suitability GIS maps provided in the Recreation Suitability Analysis. Significant findings include the following:

- Catfish Beach (Lake Almanor)—potential day use and campground area (primitive) may be considered; requires access route across private land.
- Hamilton Branch Fishing Access Site (Lake Almanor)—Almanor Fishing Association and California Department of Fish and Game (DFG) site with trail. In 2002, these entities acquired this site and constructed a new gravel parking area and portable toilet.

- Westwood Beach (Lake Almanor)—small shoreline day use site improvements may be considered.
- Stumpy Beach (Birdrock Area) (Lake Almanor)—small shoreline day use site improvements may be considered.
- Almanor Beach (Lake Almanor)—potential swim beach and parking expansion may be considered.
- Stover Ranch, First Avenue, and Super Channel areas at or near Chester (Lake Almanor) —potential shoreline access sites.
- Eastshore Campground/DUA Component (New) (Lake Almanor)—small shoreline day use site improvements may be considered at existing cove.
- Canyon Dam DUA (Lake Almanor)—potential expansion may be considered.
- Area between Lake Almanor Campground and Dyer View DUA (Lake Almanor)—new shoreline day use site may be considered.
- Dyer View DUA (Lake Almanor)—potential expansion may be considered.
- Area south of Lake Almanor West Community Club (Lake Almanor)—Collins Pine-owned land—potential campground/DUA may be considered.
- Butt Valley Powerhouse area (Butt Valley Reservoir)—an angler access trail and trailhead may be considered.
- Three areas south of Cool Springs Campground on the east shore (Butt Valley Reservoir)—possible dispersed use shoreline sites with pullouts may be considered.
- Areas on the west shore near the Butt Valley Dam (Butt Valley Reservoir)—possible boat-in dispersed use sites may be considered.

- Area west of the Butt Valley Dam (Butt Valley Reservoir)—possible walk-in dispersed shoreline use area; use of the existing gated road by dam may be considered.
- Area near gauging station below Belden Forebay Dam (Belden Reach)—possible boater put-in and angler access site may be considered.
- Gansner Bar area (Belden Reach)—possible boater and angler access site may be considered.

Overall Day Use/Picnicking Needs

Based on a review of the above factors and indicators, overall day use/picnicking needs and potential options to address these needs have been identified in the study area. It should not be assumed that these are proposed PME measures. Site-specific day use/picnicking needs are discussed in the Recreation Facility and Use Area Needs by Site (Section E5.2.9.4.2) below. Potential options to satisfy overall day use/picnicking needs include:

- Consider maintenance and improvements to existing public day use/ picnicking facilities. Facilities at several of the existing public DUAs are variable and are in need of maintenance, repair, or replacement. This includes restroom facilities, picnic tables, trash receptacles, and drinking fountains and water faucets where applicable. Older day use sites may be modernized over time. The Forest Service currently has future renovation plans for its DUAs on Lake Almanor that include repairing, replacing, and renovating certain day

use site elements (picnic tables, restrooms, parking areas) (Forest Service 2001b and 1994; *Red Bluff Daily News* 2001).

- Consider increasing the supply of public day use/picnicking facilities to meet future demand. Since parking spaces are the primary limiting factor at public day use/picnicking facilities, it is important to consider the need for these facilities.

  — Projected demand at individual public day use/picnic areas indicates that day use capacity may be expanded over time. At these sites, a total of approximately 135 new additional parking spaces or more would be needed in the study area to accommodate future demand through 2035. These additional parking spaces could potentially be accommodated at four existing public sites: Dyer View DUA (Lake Almanor), Canyon Dam Boat Launch/DUA (Lake Almanor), Almanor Beach (Lake Almanor), Canyon Dam DUA (Lake Almanor), and Alder Creek DUA/Boat Launch (Butt Valley Reservoir). However, use should be monitored to determine potential needs at other sites. Additional picnic tables, toilets, and other day use amenities may also be considered as demand increases and new parking spaces are added.

  — Potential new public day use/picnicking areas may also be considered to meet future demand. A potential location is adjacent to the existing North Shore Campground (Lake Almanor) on the northern shoreline of Lake Almanor near the town of Chester (Lake Almanor). Other potential locations for new day use/picnicking area at Lake Almanor include the

area adjacent to the Hamilton Branch Powerhouse (an area that DFG acquired in 2002 and developed), area between Dyer View and Canyon Dam, area between Lake Almanor West and Almanor Boat Launch, the area at Westwood Beach, the area at Stumpy Beach (Birdrock area) on Lake Almanor, areas along First and Second Avenues near Chester, and the Super Channel area west of Chester.

- Consider ADA compliance at all existing and new facilities. New ADAAG guidelines (currently out for public comment) define how many picnic sites with tables should be accessible at a site based on the total number of picnic tables provided. As improvements or major maintenance is made to existing public picnic areas, accessibility may be enhanced based on these new ADAAG guidelines when adopted. In addition, all new facilities (including parking areas, picnic tables, fire rings, water faucets, trash receptacles, and paths to other accessible facilities) at picnic sites designated as accessible must adhere to ADAAG guidelines. Planned 2006 Capital Improvement Program renovations at Forest Service DUAs, specifically at Lake Almanor, include improvement plans regarding ADA-accessible DUA facilities (Forest Service 2001b and 1994; *Red Bluff Daily News* 2001). Specific improvements needed at existing public picnic areas are identified in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site and Section E5.1.4—ADA Accessibility Study.

E5.2.9.4.1.3 Overall Boating Needs in the Study Area

Overall boating-related supply, demand, capacity, and suitability factors to consider are presented below, followed by a discussion of overall needs. Boating facility needs that were analyzed in the study area include:

- Boat launches, ramps, courtesy loading docks, and boarding floats
- Parking for vehicles with trailers
- Marina slips/moorage facilities

Whitewater river boating and fishing is addressed in a following section.

Boating Supply Factors

Important boating-related supply factors to consider are summarized below (see Section E5.23—Reservoir Boating Study for more detail; and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Study Area, for the location of recreation sites and facilities in the study area).

- There are three public boat launches in the study area, plus other private resort and private community boat launches. The Forest Service operates two public boat launches on Lake Almanor: Almanor Boat Launch and Canyon Dam Boat Launch/DUA. The Almanor Boat Launch has two concrete lanes, while the Canyon Dam Boat Launch/DUA has three concrete lanes. The Licensee operates the Alder Creek DUA/Boat Launch on Butt Valley Reservoir. This public boat launch has one concrete ramp lane.

- A boat speed limit exists on Butt Valley Reservoir and a posted informational sign at Alder Creek DUA/Boat Launch states this Plumas County regulation (Plumas County Visitors Bureau 1998). A Plumas County ordinance (Section 10-1.10[e]) prohibits waterskiing and PWC use at Butt Valley Reservoir.
- There are no fees associated with the use of either Licensee or Forest Service public boat launches in the study area.
- There is parking for approximately 23 vehicles and 114 vehicles with trailers at these three public boat launches. On Lake Almanor, the Almanor Boat Launch provides 53 vehicle with trailer spaces, while the Canyon Dam Boat Launch/DUA provides 13 vehicle and 51 vehicle with trailer spaces. Alder Creek DUA/Boat Launch, on Butt Valley Reservoir, provides 10 vehicle spaces and 10 vehicle with trailer spaces.
- Lake Almanor is 13 miles long and up to 6 miles wide. The reservoir provides approximately 52 miles of shoreline and covers approximately 27,092 surface water acres at full pool elevation of 4,494 feet (Licensee 2000b). Butt Valley Reservoir is approximately 5 miles long and has a width of just under 1 mile at its widest point. The reservoir covers approximately 1,600 surface water acres at full pool elevation of 4,142 feet (Licensee 2000b).
- At full pool, all boat launches in the study area meet a standard California Department of Boating and Waterways (Cal Boating) 3-foot minimum water depth requirement at the toe of the ramp. Forest Service field staff field observations indicate that the toe is submerged year-round, though usually

inaccessible between October 15 and May 1 due to snow and road closures (Forest Service 2001a). Water depth at private boat launch ramps varies site by site. Exact ramp toe elevations at all boat launches were surveyed by the Licensee in 2002.

- Due to accumulated snow and road closures, the Alder Creek DUA/Boat Launch is not usable year-round. However, this Butt Valley Reservoir ramp is accessible during the primary recreation season. The shallow angle of the boat ramp is not optimal. It presents problems for some vehicles and requires backing farther into the water compared to a steeper ramp.
- When possible, the Licensee holds the pool elevation of Lake Almanor and Butt Valley Reservoir high from Memorial Day to Labor Day weekend to provide recreational access.
- The normal high pool elevation of Lake Almanor is 4,494 feet and the minimum low pool is 4,469 feet (Licensee 2000b). Given the unpredictable nature of weather and the dependence of reservoir levels on rain and snowfall, the Licensee attempts to maintain an operational water level of between 4,494 feet and 4,474 feet during the summer recreation season on Lake Almanor.
- The Plumas County Sheriff's Department Marine Patrol has historically placed and maintained marker buoys and hazard markers on Lake Almanor and Butt Valley Reservoir. The Licensee and Plumas County are currently working on completing a Memorandum of Understanding (MOU) that will define the roles and responsibilities of both parties related to marking and identifying submerged hazards at Project reservoirs.

- The water level of Butt Valley Reservoir can range from a maximum pool elevation of 4,132 feet to a minimum of 4,115 feet (Licensee 2000b), though the summer minimum is usually held around 4,120 feet. Pool levels on both reservoirs may occasionally be drawn down further for maintenance.
- There are no public marine sanitation sites (pump outs, dump stations) in the study area that are available for general public use. However, there are several private recreation facilities on Lake Almanor that provide marine sanitation sites. There are also no floating restrooms in the study area.
- There are no public fuel docks in the study area. Several private fuel docks are located on Lake Almanor. There are no fuel docks on Butt Valley Reservoir.
- There are numerous marina slips at various private boating facilities around Lake Almanor. In the past, there was also a marina between the two jetties located to the south of Almanor Beach, though the marina was removed many years ago. There are no public marina slips in the study area.
- Private recreation providers supply the majority of boating facilities at Lake Almanor. There are approximately 14 private boat launches and over 20 private marinas with a total of nearly 900 boat slips on Lake Almanor. Many of these slips are available for public use. Some existing and potential future private recreation facilities, including a possible Lake Almanor West Community Club proposal for a private, multi-slip marina in the future. This proposal will need to be approved by the Licensee and FERC.

- Possible future private marinas or additional boat slips may be constructed at Big Cove and Bailey Creek Cove on Lake Almanor.
- The public can use some of these private boating-related facilities for a fee, while the use of others requires membership or ownership. The North Shore Campground, and other resorts allow the public to use their boat launches for a fee. However, their capacities are generally limited and the availability for public use is not readily apparent to new visitors.
- Many of the older private commercial boat ramps were constructed prior to the reservoir level being raised to 4,494 feet and should still provide access to the lower lake levels, such as Plumas Pines Resort and Lassen View Resort.
- None of the boat launches in the study area are ADA-accessible under the new guidelines approved in the last few years.
- Belden Forebay does not have a developed boat ramp or launch area. Some visitors use an informal user-defined area to launch small car-top boats at the Forebay near the Caribou Village gate. A Plumas County ordinance limits boat speeds to 5 miles per hour (mph) and boat motor 10 horsepower (hp) at small reservoirs such as Belden Forebay.
- Most of the facilities are in good condition at all three public boat launches in the study area. However, portions of the access road, parking area, and the courtesy dock at Almanor Boat Launch and the boat ramp and courtesy dock at Canyon Dam Boat Launch/DUA are in need of repair. The Forest Service plans to improve both boat launches on Lake Almanor in 2003 (*Red Bluff Daily News* 2001). Planned improvements include resurfacing the boat ramps,

adding new courtesy docks, repairing and repaving parking areas, renovating restrooms, and widening and repaving the access roads, among other things.

Boating Demand Factors

Important boating related demand factors to consider are summarized below (see Section E5.2.3—Reservoir Boating Study).

- At Lake Almanor, motorboating was one of the most commonly reported boating-related activities (42 percent) by visitors who completed the questionnaire survey. Waterskiing (34 percent) was also one of the most commonly reported activities. Other boating-related activities that account for some use on Lake Almanor include canoeing (9 percent), jet-ski or personal watercraft (PWC) use (8 percent), sailing (3 percent), and windsurfing (2 percent). Fishing from a boat is also a popular activity at Lake Almanor, but use levels were not by fishing type (boat or bank).
- Butt Valley Reservoir is primarily used for fishing, both boat and bank. Other boating-related activities occurring on the reservoir include motorboating (30 percent) and canoeing (22 percent). Most motorboating is likely fishing-related, as a Plumas County ordinance limits boat speeds to a maximum of 25 mph (Plumas County Visitors Bureau 1998).
- Perceived crowding on both Lake Almanor and Butt Valley Reservoir is relatively low, indicating crowding is currently not a concern on either reservoir.

- Perceived crowding (scale of 1 to 9) on Lake Almanor was measured by reservoir segment (see Section E5.2.3—Reservoir Boating Study). Segment D (the southeastern portion of the reservoir) had the highest mean perceived crowding score (3.2). Segment A (the northern portion of the reservoir above the causeway on SR 36) had the lowest mean score (2.7). As a result of a drought in 2001, the northern portion of Lake Almanor, especially north of the causeway, had very little water and may have resulted in lower crowding scores.
- The mean perceived crowding on Butt Valley Reservoir was 2.8. However, approximately 39 percent of visitors considered the reservoir to be "not at all crowded" (perceived crowding score of 1).
- On water perceived crowding scores were not collected for Seneca Reach. On Belden Reach, the mean perceived crowding score was 3.4. While higher than Butt Valley Reservoir or the individual segments on Lake Almanor, this perceived crowding score is still relatively low and indicates that visitors may feel slightly crowded. Additionally, nearly 15 percent of visitors considered Belden Reach to be "not at all crowded" (perceived crowding score of 1).
- At Lake Almanor, less than half (42 percent) of survey respondents indicated that reservoir levels were unacceptable (either moderately or totally unacceptable). About a third (29 percent) rated the reservoir level as either moderately or totally acceptable. Fifteen percent of Lake Almanor respondents felt that reservoir levels were totally acceptable while 13 percent felt that pool levels were totally unacceptable. The remaining 24 percent of

respondents felt neutral or indicated that water levels did not apply to them. The 2001 drought likely influenced boater responses to be more negative compared to a normal water year.

- At Lake Almanor, 17 percent of respondents to the 2001 survey felt the reservoir level was totally acceptable for safety purposes, while 10 percent felt the pool level was totally unacceptable for safety purposes. The remaining respondents either felt neutral (20 percent) about pool levels or felt that pool levels were moderately acceptable (17 percent) or moderately unacceptable (23 percent) for safety purposes.
- Water level fluctuations (42 percent), exposed land during lower water levels (43 percent), and shallow areas during lower water levels (42 percent) were considered the biggest problems by Lake Almanor boaters who were surveyed in 2001.
- At Butt Valley Reservoir, over half (56 percent) of the 2001 survey respondents felt that the reservoir level was totally acceptable, while 4 percent felt that pool levels were totally unacceptable. Fifteen percent indicated that they felt neutral about reservoir levels, while only 1 percent did not feel that pool levels applied to them.
- At Butt Valley Reservoir, over half of the 2001 survey respondents (58 percent) felt that the reservoir level was total acceptable for safety purposes. An additional 15 percent of respondents felt that the pool level was moderately acceptable for safety purposes. Approximately 13 percent of respondents felt neutral about reservoir levels, while smaller percentages of

respondents felt reservoir levels were moderately unacceptable (5 percent) or totally unacceptable (4 percent).

- Water-based recreation opportunities are in high demand. Annual increases in demand include non-motorized boating (1.18 percent), motorboating (1.20 percent), waterskiing (1.02 percent), and fishing from a boat (0.60 percent).
- During the term of the new license or by the year 2035, demand for boating and water-based recreation activities should increase including: non-motorized boating (51 percent), motorboating (52 percent), waterskiing (43 percent), and fishing from a boat (23 percent).
- Overall, Lake Almanor visitors were roughly neutral in their support for more day use and overnight moorage facilities.

Boating Capacity Factors

Important boating capacity factors to consider are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis and Section E5.2.3—Reservoir Boating Study for more detail).

- Facility Capacity—Facility capacity is a limiting factor at all three public boat launches (Almanor Boat Launch, Canyon Dam Boat Launch/DUA, and Alder Creek DUA/Boat Launch) in the study area. Overall utilization of the public boat launches on Lake Almanor was at 81 percent of capacity during the season and at 91 percent of capacity during peak months. Seasonal utilization of Alder Creek DUA/Boat Launch was 69 percent, while peak month utilization was 64 percent.

Ramp length is also a facility limiting factor at Almanor and Canyon Dam public boat launches and at some private launches when during lower pool elevations these boat ramps can be unusable during the latter part of the recreation season during low lake levels that occur during drought years or after the recreation season during wetter years. Canyon Dam Boat Launch/DUA has a somewhat longer ramp compared to the Almanor Boat Launch and is accessible for a longer period of time.

The Alder Creek DUA/Boat Launch is unusable during certain times of the year when the access road is not plowed. Its ramp angle is also not steep enough to provide adequate launching capacity by a standard vehicle (vehicle must back far into the water to launch).

- Physical/Spatial Capacity—Physical/spatial capacity is not a severe limiting factor at the public boat launches in the study area as some parking space expansion capability exists. Also, Lake Almanor, even at lower pool elevations, is one of the largest bodies of water in California (see Section E5.2.3—Reservoir Boating Study). On the reservoir surfaces, the reservoir draw down at Lake Almanor reduces the boatable area; the northern area becomes too shallow for power boating to occur. The boatable area in the remaining southern portions of the lake, because of relatively steeper slopes, are, is much less effected. While by late summer and early fall at Lake Almanor higher boating densities can exist in some areas, these densities are

still well below safe and enjoyable boating density standards. In addition, as the pool elevation drops, boating hazards begin to appear. These hazards become more evident as islands develop, as the peninsula point becomes shallow with stumps and rocks near the surface, and as other shallow areas develop. At Butt Valley Reservoir, physical/spatial capacity is not a severely limiting factor at the public boat launch and boating is not significantly affected by drawdowns, especially since there is no similar drawdown condition to that at Lake Almanor.

- Social Capacity—Social capacity is a limiting factor at only one of the public boat launches, Almanor Boat Launch. The average perceived crowding score among visitors to this site was 4.5, which is the highest of all of the sites in the study area. This average for all sites at Lake Almanor is 3.5. This level of crowding indicates that visitors feel slightly to moderately crowded. However, only approximately 9 percent of visitors felt the Almanor Boat Launch was more crowded than they expected, indicating that most visitors expect larger crowds at this site.
- Ecological Capacity—Ecological capacity is only considered a limited factor at one of the public boat launches in the study area, Canyon Dam Boat Launch/DUA. This site is in proximity to a wetland/riparian area to the south and bald eagle nest areas. Any expansion plans need to avoid this area.
- Capacity Summary—Use levels at two public boat launches (Canyon Dam Boat Launch/DUA and Alder Creek DUA/Boat Launch) are exceeding capacity, while use at Almanor Boat Launch is approaching capacity.

Boating Suitability Factors

Important boating-related suitability factors are summarized below (see Section E5.2.7—Recreation Suitability Analysis and Section E5.2.3—Reservoir Boating Study for more detail). A few areas were identified as suitable for additional facility development, including new or expanded public boating facilities. All potential public boat launch facility expansion or construction must consider water depth, wind (and resulting wave action), and suitable access and parking area. These are identified on the Recreation Development Suitability GIS maps provided in the Recreation Suitability Analysis. Significant findings include the following areas:

- Area north of Canyon Dam Boat Launch/DUA (Lake Almanor)—expansion potential may be considered for parking.
- North Shore Campground (Lake Almanor)—boat launch enhancements may be considered to improve public boat launching on the northern shoreline of Lake Almanor, especially for residents of Chester.
- Area on western shoreline of Belden Forebay at the Caribou Village (Belden Reach)—small car-top boat launch may be considered; possible use of an existing parking lot north of Caribou Village (by the gate) may be considered.
- Area near the gauging station below Belden Forebay Dam (Belden Reach)—possible boater access may be considered at this site (if recreational flows are provided).

Overall Boating Needs

Based on a review of the above factors and indicators, overall boating-related needs and potential options to address these needs have been identified in the study area. It should

not be assumed that these are proposed PMEs. Site-specific boating-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site and Section E5.2.3—Reservoir Boating Study. Potential options to satisfy overall boating-related needs include:

- Consider maintenance and improvements to existing boating-related facilities. Facilities at several of the existing public boat launches are in need of maintenance, repair, or replacement. Although the primary needs associated with public boat launches are adequate parking and boat ramp length, other considerations include toilets, boarding floats, and docks. The Forest Service is planning future renovation of its boat launch sites on Lake Almanor that include repairing, replacing, and renovating certain boat launch elements (ramps, courtesy docks, parking) (*Red Bluff Daily News* 2001).
- Consider increasing the supply of boating-related facilities to meet current and future demand. Increasing the supply of boating-related facilities in the study area centers around three types of improvements: (1) additional parking capacity, (2) lengthening or modifying one or more boat ramp lanes, and (3) potential new boating-related facilities.
  - Additional Parking Capacity—In order to accommodate increases in demand for boating-related facilities in the study area, approximately 120 additional parking spaces may be considered at existing public boat launches. The majority of parking spaces (100) are needed on Lake Almanor and could potentially be located to the north of the existing Canyon Dam Boat Launch/DUA. The remaining spaces are needed on

Butt Valley Reservoir and could potentially be located at Alder Creek DUA/Boat Launch or nearby.

— Lengthening or Modifying Boat Ramp Lanes—Consideration may be given to lengthening the boat ramps at one of the public boat launches in the study area. A reservoir the size of Lake Almanor should ideally have two year-round launches at either end. The Plumas Pines Resort Boat Launch is currently available for use year-round. Currently, while the Almanor and Canyon Dam public boat launches provide water access during the summer season of most years, these ramps cannot be used during some latter season lower pool elevations that occur during drought years. The ramp toe of the Canyon Dam Boat Launch provides boating launching access to the 4,478-foot elevation and the Almanor Boat Ramp provides water access to the 4,481-foot elevation. Lengthening one of the two public boat ramps so that the reservoir can be accessed during lower pool elevations and year-round may be considered. The Alder Creek DUA/Boat Launch on Butt Valley Reservoir may also be modified when major renovation is needed. The current ramp is not steep enough to facilitate boat launching by lower-profile vehicles (vehicles must drive farther and deeper into the water). Dredging and excavation to create a steeper boat ramp (approximately a 14.5 percent slope) may be considered at this site (if feasible).

— Potential New Boating-Related Facilities—An improved public boat launch facility may be considered at the northern end of Lake Almanor. The current boat launch at the private North Shore Campground (currently open for public use for a fee) may be considered for replacement or renovation, as it would provide convenient boat access to the reservoir for residents of Chester and nearby northern areas. Also on Lake Almanor, short-term moorage may potentially be considered between the existing Prattville jetties located to the south of Almanor Beach. In the past, the Forest Service has considered adding short-term public boat moorages at this site (mooring balls or moorage slips) (Forest Service 1994). In the future, additional public short-term moorage opportunities may be considered on Lake Almanor. Another potential location for additional boat moorage is the potential new Licensee campground along the southeastern shoreline of Lake Almanor.

In addition, a potential car-top non-motorized boat launch may be considered on Belden Forebay. This site could potentially be located adjacent to Caribou Village. Due to the relatively small surface acres of Belden Forebay, a boating speed limit (less then 5 mph and less than 10 hp engine boats) per a Plumas County ordinance may be assumed and informational signs posted at this potential boater access site. Similar to Rock Creek and Cresta Reservoirs, the county should consider adopting a new ordinance (like Section 10-1.19). This would include rules such as:

no swimming or boating within 0.25 mile of the dam; no swimming or boating at night; no boating speeds in excess of 5 mph; and no boats with more than 10 hp engines.

- Consider ADA compliance at some existing and new facilities. ADAAG guidelines related to boating facilities only that have recently been adopted by the Access Board need to be implemented, particularly related to docks, gangways, and boat entry. In addition, at least one fully accessible public boat launch may be provided on each reservoir. All facilities (including boarding floats, docks, parking spaces, toilets, water faucets, trash receptacles, and paths to other accessible facilities) at boat launches designated as accessible should adhere to ADAAG guidelines. Any new boating-related facilities should also adhere to these guidelines. Plans for improving the Almanor and Canyon Dam Boat Launches, including ADA accessibility enhancements, have been submitted by the Forest Service. Cal Boating has provided grant money to complete some of the public boat launch improvements starting in 2003.

- Consider enhancing boater safety at Lake Almanor. As the reservoir is drawn down during the recreation season, boating hazards begin to appear including shallow areas to the north, along the shorelines, and at the islands; and several rocks and stumps begin to appear in shallow areas, particularly at the peninsula point. Some boaters are inexperienced with these low pool conditions. Consider providing and maintaining additional marker buoys and other appropriate apparatus to enhance boater safety. A future signed MOU

between the Licensee and Plumas County will clarify responsibilities related to the Plumas County Sheriff's Department request for the Licensee to assume the responsibility for placing and maintaining boating markers and buoys. This MOU should be signed in 2002. Consider providing increased Sheriff's Department patrols at Lake Almanor during the summer recreation season.

E5.2.9.4.1.4 Overall Swimming and Sunbathing Needs in the Study Area

Overall public swimming and sunbathing supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs.

Swimming and Sunbathing Supply Factors

Important public swimming and sunbathing supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR study area for the location of recreation sites and facilities in the study area).

- Swimming and sunbathing supply factors are closely tied to DUA supply factors. Refer to Section E5.2.9.4.1.2—Overall Day Use/Picnicking Needs in the study area for a complete discussion of supply factors as they relate to DUAs, including beach areas.
- Only one of the public developed recreation facilities, Almanor Beach, in the study area has a designated swim area with a buoy safety line. The facilities associated with swimming and sunbathing at this site are in good condition. Additionally, three public DUAs (Dyer View, Canyon Dam, and Alder Creek

DUA) and three public campgrounds (Lake Almanor, Ponderosa Flat, and Cool Springs Campground) have undefined opportunities for swimming and sunbathing.

- In addition to defined and undefined swimming and sunbathing at developed recreation sites in the study area, many of the dispersed recreation sites are popular swimming areas.
- Almanor Beach, the only developed and designated swimming area, does not have ADA-accessible access to the water.

Swimming and Sunbathing Demand Factors

Important swimming and sunbathing demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use for more detail).

- At Lake Almanor, swimming and sunbathing accounted for more than 40 percent of use at four of the developed DUAs according to questionnaire survey results including: Canyon Dam Boat Launch/DUA (41 percent), Dyer View DUA (45 percent), Almanor Boat Launch (41 percent), and Almanor Beach (53 percent). Additionally, swimming and sunbathing accounted for 25 percent of use at the Canyon Dam DUA.
- At Butt Valley Reservoir, fishing tends to be the most participated in activity. However, 24 percent of visitors to the Alder Creek DUA/Boat Launch participated in swimming and sunbathing. Additionally, swimming and sunbathing accounted for 30 percent of use at undeveloped dispersed

swimming areas on the eastern shoreline of the reservoir, between Cool Springs Campground and the Butt Valley Dam.

- Along Seneca and Belden Reaches, there are no developed swimming/sunbathing areas. Similar to Butt Valley Reservoir, bank fishing tends to be one of the most participated in activities in the reaches. However, certain undeveloped dispersed areas do receive some swimming and sunbathing use, especially on the southern segment of Belden Reach. From Caribou Corners RV Park north to Gansner Bar Campground, swimming and sunbathing accounted for 29 percent of dispersed use. Along the segment of Belden Reach south of North Fork Campground, 36 percent of dispersed use is attributable to swimming and sunbathing.
- Demand for swimming and sunbathing is increasing in the region. The projected annual increase in demand for swimming is 1.03 percent and for sunbathing is 1.00 percent. Over the next 30 years (through 2035), demand for swimming is projected to increase by 43 percent and demand for sunbathing is projected to increase by 38 percent.
- Like other activities, use levels are dependent upon good weather conditions; temperature, rain, and wind are key factors. As a result, July and August are the primary months of participation in swimming and sunbathing.

Swimming and Sunbathing Capacity Factors

Important swimming and sunbathing capacity factors to consider are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis for more detail). Significant findings include the following:

- The overall utilization of public day use/picnicking facilities is closely tied to capacity as it relates to swimming and sunbathing. Refer to the Overall Day Use/Picnicking Needs in the Study Area section for a complete discussion of capacity factors as they relate to public picnicking/DUAs.

Swimming and Sunbathing Suitability Factors

Important swimming and sunbathing suitability factors to consider are summarized below (see Section E5.2.7—Recreation Suitability Analysis for more detail). Several public developed areas were identified as highly suitable for additional facility development, including new or expanded swimming areas. Significant findings include the following:

- North Shore Campground Area (Lake Almanor)—consider adding a public swimming/beach area to the potential new day use site at this area (this area was explored in 2002 and dropped).
- Lake Almanor Campground (Lake Almanor)—Loop 3—considered including a swimming/beach area to the potential new DUA proposed to the south of this site.
- Southeast Zone (Lake Almanor)—If a new campground is developed in the future, various coves along this section of shoreline could potentially accommodate a swimming/beach area.

- Westwood Beach Area (Lake Almanor)—this area currently provides an undeveloped beach area that could be enhanced with opportunities for swimming and sunbathing.
- Stumpy Beach (Birdrock) Area (Lake Almanor)—similar to Westwood Beach, this area currently provides an undeveloped beach area that could be enhanced with opportunities for swimming and sunbathing.
- Almanor Beach (Lake Almanor)—potential beach and parking area expansion.
- Shoreline south of Lake Almanor West Community Club (Lake Almanor) – Collins Pine-owned land.
- Shoreline between Dyer View Day Use Area and Lake Almanor Campground

Overall Swimming and Sunbathing Needs

Based on a review of the above factors and indicators, potential options to address overall swimming and sunbathing-related needs have been identified in the study area. It should not be assumed that these are proposed PMEs. Site-specific swimming and sunbathing-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Potential options to help satisfy overall swimming and sunbathing-related needs include:

- Consider maintenance and improvements to existing public swimming areas. Facilities at several of the existing public swimming areas are in need of maintenance, repair, or replacement. Designated, developed public swimming areas could have area delineators/floating booms, safety signs, and other

apparatus to enhance visitor safety and the swimming experience in the study area.

- Consider increasing the supply of public swimming facilities to meet current and future demand. Swimming is currently one of the most popular activities in the study area, and participation is projected to increase 43 percent by 2035. A new public designated swimming area(s) may be considered to meet this demand. Potential locations on Lake Almanor for a new or enhanced public swim/beach area include adjacent to the North Shore Campground (dropped in 2002), Lake Almanor Campground near Loop 3, or the Southeast Zone of Lake Almanor.
- Consider creation of a fully accessible swimming area. New ADAAG guidelines from the Access Board will likely be adopted in 2003. At least one fully accessible public developed swimming area could be provided at each large Project reservoir. At Butt Valley Reservoir, Ponderosa Flat Campground should be considered. All facilities (including parking spaces, restrooms, water faucets, trash receptacles, and paths to other accessible facilities) at public swimming areas designated as accessible should adhere with the forthcoming ADAAG guidelines.

E5.2.9.4.1.5 Overall Interpretation and Education Needs in the Study Area

Overall interpretation and education (I&E)-related supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. A

detailed I&E program for the study area will be fully developed after the new license is issued. Interpretive facility and services needs in the study area may include:

- Brochures;
- Signs and kiosks;
- Viewpoints;
- Nature trails;
- Hydroelectric facility interpretation;
- Reservoir boating hazard information;
- Educational programs and campfire talks; and/or
- Visitor contact center.

Interpretation and Education Supply Factors

Important I&E supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail, and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Area for the location of recreation sites and facilities in the study area).

- The study area does not have a visitor contact center.
- Eight public developed recreation facilities in the study area have I&E elements: Almanor Group Camp, Almanor Rest Area (SR 89), Dyer View DUA, Canyon Dam Boat Launch/DUA, LART, and Belden Rest Stop (SR 70) all have interpretive signs. Almanor Campground and Gansner Bar Campground have small amphitheaters. There are no hydroelectric facility tours and no signs exist that explain hydroelectric Project operations except at

Dyer View DUA. The study area is also lacking a comprehensive I&E program or plan. The Forest Service has proposed I&E infrastructure and programmatic improvements for the Lassen National Forest, which include emphasizing the human and natural history of the area (Forest Service 1994).

Interpretation and Education Demand Factors

Important I&E demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use for more detail).

- Demand for I&E opportunities appeared to be high regionally. Increases in demand for activities related to I&E opportunities will include a 1.31 percent yearly increase in sightseeing and a 1.20 percent yearly increase in both observing wildlife and photography.
- Through 2035, demand for I&E-related activities will increase. Demand for sightseeing is projected to increase by 58 percent, while demand for observing wildlife and photography will each increase by 52 percent by 2035.
- Demand for I&E is generally low in areas where I&E is not a major emphasis (Forest Service 1994). Latent demand for I&E facilities and programs is identified as being high in the area and many existing public recreation sites are ideal for potential new I&E facilities and/or programs.

Interpretation and Education Capacity Factors

Facility and physical/spatial capacity are most likely the limiting factors for existing and potential I&E facilities and programs in the study area. Accommodating new I&E

facilities and programs is limited by program capacity and the space available at existing and potential recreation sites for new facilities.

Interpretation and Education Suitability Factors

Important I&E suitability factors to consider are summarized below (see Section E5.2.7—Recreation Suitability Analysis for more detail).

Most of the public developed and dispersed recreation areas are highly suitable for additional facility development, including new or expanded interpretive facilities or signs. Significant findings include the following:

- All existing recreation facilities in the study area have sufficient space available for the provision of new or expanded I&E facilities, particularly signs or kiosks, which are small and take up very little space.
- Many of the areas identified as having high suitability for other types of facilities (campgrounds, picnicking facilities; boat launches) would also be suitable for new interpretive facilities or signs.

Overall Interpretation and Education Needs

Based on a review of the above factors and indicators, potential options to address overall I&E-related needs have been identified in the study area. It should not be assumed that these are proposed PME measures. Site-specific I&E-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Potential options to satisfy overall I&E-related needs include:

- Consider new I&E facilities and services. Most of the sites in the study area are highly suitable for facilities such as signs and kiosks.
- Consider the addition of I&E facilities and services in the study area to meet both current and future demand. New facilities and programs may interpret the hydroelectric Project, cultural resources, geology, natural resources, and the pre-dam history of the area. The Almanor Rest Area (SR 89) may be considered as a potential site for future I&E development. Both rest areas (Almanor Rest Area and Belden Rest Stop), as well as Canyon Dam DUA, could potentially accommodate I&E kiosks. Informational kiosks in the town of Chester and the Hamilton Branch area may also be considered as part of an I&E plan for the study area. Additionally, I&E facilities and programs (signs, brochures) could be used to educate boaters about hazards at Lake Almanor and Butt Valley Reservoir and dispersed shoreline visitors about minimizing ecological or fire hazard impacts in undeveloped areas.
- Consider ADAAG compliance at all existing and new facilities. New ADAAG guidelines developed by the Access Board should be followed for all existing and new interpretation and existing facilities. This should include exhibits, parking areas, paths to facilities, and toilets/restrooms, and any other facilities provided in conjunction with I&E facilities.
- Consider Developing an I&E Program in the Draft RRMP. The study area is currently lacking a comprehensive I&E program. The needs at Project recreation facilities will be defined in an I&E Program plan after the new license is issued.

E5.2.9.4.1.6 Overall Trail Needs in the Study Area

Overall trail-related supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. Only non-motorized recreational trail facility needs were analyzed in the study area.

Trail Supply Factors

Important trail-related supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR for the location of recreation sites and facilities in the study area).

- The Lake Almanor Recreation Trail (LART) is a paved, 10-foot wide, 9.5-mile long trail. This non-motorized, multi-use trail is open to walking, hiking, bicycling, and cross-country skiing. The trail winds through wooded areas as well as through several lakeshore areas and provides views of Lake Almanor, Dyer Mountain, and Mt. Lassen. The trail passes through public and private property, campgrounds, and near private residences. Several trailheads provide access to the trail. The northernmost access is located just off SR 89 on a gravel road along Humbug Road. This trailhead has a small gravel parking area and a trail informational sign with a trail route map. Additional paved trailheads include the Almanor Campground and Almanor Boat Launch parking area, and four other paved parking areas between the community of Prattville and SR 89. The Dyer View DUA serves as a trailhead; however, it is considered a separate facility for this report. Currently, the trail ends at Rocky Point Road adjacent to the southern end of the Licensee's Lake

Almanor Campground (Loop 3). The Forest Service has developed plans to eventually extend the trail around the entire shoreline of Lake Almanor. In the near-term, the Forest Service also plans on extending the trail from the town of Chester to its northern terminus and from the Canyon Dam Boat Launch/DUA to its southern terminus. The Forest Service has received funding to begin the southern trail extension (*Red Bluff Daily News* 2001 and Forest Service 1994). A trail extension to Chester would improve access for area residents who must now drive to area recreation sites. The Forest Service and Plumas County would like to eventually circle Lake Almanor with a recreation trail (*Red Bluff Daily News* 2001 and Forest Service 1994). It is unknown if this goal is reasonably achievable given private ownership, terrain, and other issues in some areas.

- Several short user-defined trails exist in Lake Almanor and Butt Valley Reservoir shoreline areas.
- There are no developed trails at Butt Valley Reservoir. However, there are several user-defined angler trails around the reservoir, especially at the northern end near the Butt Valley Powerhouse.
- The North Fork Fishing Trail, located at the Caribou Powerhouse 1, extends up the North Fork Feather River (NFFR) for approximately 1.5 miles to Butt Creek. This trail begins at the Caribou Powerhouse 1 and crosses next to the fenced yard and along the side of the powerhouse building along a narrow metal-grate catwalk. The outdoor metal catwalk is located above the tailrace at the turbine outlets at the powerhouse. Beyond the powerhouse, a dirt trail

follows within 50 feet of the river along its length. The trail includes two single-span footbridges that cross the narrow NFFR. The trail can also be accessed near Butt Creek from a dirt road. This dirt trail is maintained by the Forest Service.

- The Pacific Crest Trail (PCT) runs generally in a north–south direction at the western edge of the study area, crossing SR 36 approximately 6 miles west of Lake Almanor and SR 70 south of the Project at the Town of Belden. The PCT runs through one of the developed recreation sites in the study area, Belden Rest Area (SR 70). While this facility serves as an informal trailhead for the PCT, the Licensee does not maintain any portions of the trail or any associated recreation elements, such as signs.
- Belden Rest Stop (SR 70) serves as an informal trailhead for two additional trails: the Yellow Creek Trail (approximately 1.4 miles-long) and the Indian Springs Trail (approximately 6.5 miles-long). Similar to the PCT, the Licensee does not maintain any portion of either trail or any associated elements.
- The federally designated trail Spencer Meadows National Recreation Trail is located near but not in the study area. This trail is located 15–20 miles west of the town of Chester. The trail runs from SR 36/89 to Lassen Volcanic National Park, where it connects with the Park's trail system. This trail is 12 miles in length and is considered outside of the Project study area.

- Many informal unmarked trails appear to function adequately for those who use them and know about them. Informal walking can occur at all sites and along the shoreline in most areas.
- There are very few internal campground trails, resulting in visitors having to walk along roadways with vehicles and RVs.

Trail Demand Factors

Important non-motorized trail-related demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use Study for more detail).

- Demand for trail-related activities will increase significantly by 2035. Hiking/walking is projected to increase by 1.22 percent annually, while bicycling/mountain biking will experience a yearly increase of 1.00 percent. By 2035, demand for hiking/walking will increase by 53 percent and demand for bicycling/mountain biking will increase by 41 percent. In addition to demand for new trails being high, new trails are the number one recreation need on the west coast as identified in SCORP (DPR 1994), as well as other state SCORP plans.

Trail Capacity Factors

There is a lack of information on use levels of the existing non-motorized trails; therefore, there is no relevant information concerning trail-related capacity factors. However, the LART is very popular with visitors to the study area, including residents of the nearby communities, and does receive a high level of use. Proposed extensions of

this trail are planned in the future through a new grant application. When the trail is extended to the town of Chester and Canyon Dam Boat Launch/DUA, trail use levels will likely increase.

Trail Suitability Factors

New trail opportunities were not a focus of the Recreation Suitability Analysis (Section E5.2.7) due to GIS pixel size and study focus. However, formalized short trails (such as to the shoreline) should be considered at several existing and potential new recreation sites. Linkage trails between existing and potential future recreation sites should also be considered. Additionally, there are short-term plans to extend the LART to Chester at the northern end and to the Canyon Dam Boat Launch/DUA at the southern end. The Forest Service has received funding to complete the southern extension of the trail. There are longer-term plans to extend this trail around the entire reservoir (Forest Service 2001b, 1994 and Plumas County 1990).

Overall Trail Needs

Based on a review of the above factors and indicators, potential options to address overall trail-related needs have been identified in the study area. It should not be assumed that these are proposed PMEs. Site-specific trail-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site.

Potential options to satisfy overall trail-related needs include:

- Consider new trail opportunities in the study area. New non-motorized trail development may be considered at suitable locations. Potential new Lake Almanor area trail opportunities are listed below:
  - — Chester to North Shore Campground—a bike lane across the existing causeway may be considered to provide residents of Chester access to the potentially improved public day use facilities at North Shore Campground. This route may someday follow the existing rail line ROW if abandoned.
  - — Northern extensions of the LART—extension of this trail from the town of Chester along the shoreline in Chester to Main Street may be considered. The Forest Service and Almanor Recreation and Parks District currently have plans to complete these extensions (Forest Service 1994).
  - — Southern extension of the LART—an extension of this trail (1.5 miles) to Canyon Dam Boat Launch/DUA may be completed. The Forest Service has funding to complete this extension (*Red Bluff Daily News* 2001), however, construction has not yet begun.
  - — Canyon Dam Boat Launch/DUA to Almanor Scenic Overlook—this trail may be considered to provide linkage between these two public developed recreation sites and Canyon Dam DUA. Construction of this trail segment would further the goal of extending the LART around the entire reservoir.
  - — Almanor Scenic Overlook through the Southeast Shoreline Zone—this trail, if feasible, may be considered to provide linkage between the Almanor Scenic Overlook, Eastshore DUA, and future developed recreation sites along this segment of the reservoir shoreline. Construction

of this trail would further the goal of extending the LART around the entire reservoir.

— To complete the trail loop: Southeast Shoreline Zone to North Shore Campground—this trail segment may be considered to complete the extension of the LART around the entire reservoir shoreline. Some segments of this trail would likely need to be within the highway ROW.

— Last Chance Campground to the LART loop—this northern trail linkage would connect Last Chance Campground to the North Shore Campground area along the eastern shoreline north of the causeway.

- Potential new Butt Valley Reservoir trail opportunities include:

  — Eastern shoreline linkage trail—a trail may be considered along the eastern shoreline of the reservoir to provide dirt trail linkage between the existing public recreation sites.

  — Butt Valley Powerhouse to Ponderosa Flat Campground—a trail linking the potential angler access area near the Butt Valley Powerhouse to Ponderosa Flat Campground may be considered. This trail would be a northern extension of the eastern shoreline linkage trail discussed above.

  — Butt Valley Dam to the old operator's house area — a trail providing walk-in access to a potential dispersed DUA on the shoreline near the dam may be considered in this area.

- Consider a coordinated management effort to facilitate the extension of the LART. The Licensee could cooperate with the Forest Service and/or Almanor Recreation and Park District to allow the extension of the LART across

Licensee-owned Project lands surrounding Lake Almanor by providing trail easements.

- Consider trail improvements to the existing North Fork Fishing Trail. Consider potential improvements to the North Fork Fishing Trail. Trail improvements may include an improved trail along the chain-link fence at the Caribou Powerhouse 1 yard, better trail access from a new trailhead parking area located near the Caribou Village gate, new trail signage, and a retrofit of the metal-mesh trail decking at the Caribou Powerhouse 1 located above the tailrace at the turbine outlets.
- Consider the construction of ADA-accessible trails in the study area. Accessible paths and trails may be considered as part of improvements to existing and potential new recreation facilities.

E5.2.9.4.1.7 Overall Fishing Needs in the Study Area

Overall fishing-related supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. Fishing is the focus of much of the use at Butt Valley Reservoir, but is also a popular activity at Lake Almanor and elsewhere.

Fishing Supply Factors

Important fishing-related supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail and Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR for the location of recreation sites and facilities in the study area).

- There is one accessible fishing access site in the study area. Built by the Forest Service, the accessible fishing access site is located near the Canyon Dam Boat Ramp/DUA on Lake Almanor. The Forest Service plans to extend this ramp in the future. There are no other designated angler access piers or docks, no ADA-accessible fishing opportunities, and no fish cleaning facilities.
- Portions of the Lake Almanor and Butt Valley Reservoir shoreline, as well as shoreline portions of Seneca and Belden Reach, are fairly accessible to bank anglers except where steep topography prohibits access. Some user-defined fishing access trails have been developed by anglers on both reservoirs and along Project river reaches.
- Higher use undeveloped fishing areas at Lake Almanor include: the Catfish Beach area on the northern shoreline, the Hamilton Branch Powerhouse area on the northeastern shoreline, and the Prattville jetties area to the south of Almanor Beach on the southern shoreline. The southern shoreline of Lake Almanor in general receives a high level of dispersed use, some of which is attributable to anglers.
- Popular undeveloped fishing areas at Butt Valley Reservoir include the area near the Butt Valley Powerhouse and various shoreline areas along the eastern shoreline and near the dam.
- Undeveloped fishing opportunities at Project river reaches include: the area just below Canyon Dam and Skinner Flat on the Seneca Reach, the Seneca

Bridge area, the North Fork Fishing Trail area, and various other areas along lower Belden Reach.

- Both Butt Valley Reservoir and Lake Almanor are used by boat anglers, but fishing is more of a focus on Butt Valley Reservoir.

Fishing Demand Factors

Important fishing-related demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use Study for more detail).

- Bank fishing is one of the most popular dispersed uses at Butt Valley Reservoir, especially at the northern end of the reservoir. Near the Butt Valley Powerhouse, bank fishing accounts for approximately 88 percent of dispersed use (based on field observation). In the area from the powerhouse south to Ponderosa Flat Campground, bank fishing accounts for 70 percent of dispersed use. While not as popular along the southern shoreline of Butt Valley Reservoir, bank fishing nonetheless accounts for nearly 27 percent of dispersed use in the area from Cool Springs Campground south to the Butt Valley Dam.
- Bank fishing is also one of the most popular dispersed uses at Project river reaches, especially the Belden Reach. Bank fishing accounted for much of the use at the following dispersed areas: the area north of Gansner Bar Campground (35 percent), the area to the south of North Fork Campground (29 percent), the area between North Fork Campground and Queen Lily

Campground (42 percent), the area from Queen Lily Campground to Belden Forebay (28 percent), and the Caribou Powerhouse parking area (60 percent).

- Fishing is increasing in demand annually at 0.60 percent for both boat angling and bank angling. By 2035, each of these types of angling is projected to increase by 23 percent.

Fishing Capacity Factors

Important fishing-related capacity factors to consider are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis, Section E5.2.3—Reservoir Boating Study, and Section E5.2.8—Whitewater Boating Study for more detail). Significant findings include the following:

- Boat anglers use the entire reservoir area, but tend to concentrate in areas of known good fishing. Bank anglers may use much of the shoreline for fishing but tend to concentrate in areas with road or informal trail access, especially at existing recreation sites and dispersed use areas (see Fishing Supply Factors for more detail on specific dispersed areas that receive a high level of use). This is particularly true along Project river reaches.
- Many boaters (approximately 47 percent) on Lake Almanor, many of whom are anglers, feel that pool levels are a moderate to big problem.

  Additionally, exposed land (49 percent) and shallow areas (48 percent) are considered moderate to big problems. Pool levels were abnormally low in 2001 at Lake Almanor due to the drought and likely contributed to these larger percentages. A much smaller percentage of boaters on Butt Valley

Reservoir felt pool levels (20 percent), exposed land (12 percent), and shallow areas (14 percent) were moderate to big problems. Pool levels fluctuate less at Butt Valley Reservoir compared to Lake Almanor that has a draw down operation and results in less potential conflict at Butt Valley Reservoir.

Fishing Suitability Factors

Important fishing-related suitability factors to consider are summarized below (see Section E5.2.7—Recreation Suitability Analysis for more detail). Some of the areas identified as having high suitability for other facilities (campgrounds, picnicking facilities, boat launches) would be suitable for new fishing-related facilities (piers and docks). Significant findings include the following areas for potential new fishing-related facilities:

- Catfish Beach Area (Lake Almanor)—a potential day use angler access area may be considered here.
- Prattville Jetties Area (Lake Almanor)—potential angler access site may be considered at this location.
- Butt Valley Powerhouse Area (Butt Valley Reservoir)—an angler access trail and trailhead/parking area may be considered here.
- Belden Forebay—a new trailhead for the North Fork Fishing Trail may be considered at a proposed car-top boat launch site here, as well as improvements to the metal catwalk at the Caribou Powerhouse 1.
- Area near the gauging station below Belden Forebay Dam (Belden Reach)—possible enhanced angler access site may be considered at this location.

- Gansner Bar area (Belden Reach)—possible enhanced angler access site may be considered at this location.
- Seneca Bridge (Seneca Reach)—possible angler access parking improvements here along the road shoulder.

Overall Fishing Needs

Based on a review of the above factors and indicators, potential options to address overall fishing-related needs have been identified in the study area. It should not be assumed that these are proposed PME measures. Site-specific fishing-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Potential options to satisfy overall fishing-related needs include:

- Consider providing ADA-accessible fishing sites in the study area. Currently, there is one accessible fishing site in the study area at Canyon Dam Boat Launch/DUA. At least one fishing pier or platform could be provided on each reservoir to meet current and future demand for bank fishing. If new fishing piers or platforms are installed, they should be constructed to adhere with ADAAG guidelines and located where fishing success is high. A potential new accessible fishing platform may be considered at one of the existing Prattville jetties near Almanor Beach (Lake Almanor), at the Butt Valley Powerhouse area (Butt Valley Reservoir), and/or at the area to the north of Ponderosa Flat Campground (Butt Valley Reservoir). Additionally, the ADA-accessible ramp at the Canyon Dam Boat Launch/DUA could be extended

soon. The Forest Service currently has plans for this extension (*Red Bluff Daily News* 2001).

- Consider providing additional angler access areas in the study area. Additional angler access areas may be considered in the study area. A location on Lake Almanor for additional angler access is at the Hamilton Branch Powerhouse. The DFG and Almanor Fishing Association recently developed a new site next to the bridge. This site is heavily used and could be further developed and expanded. Other locations to consider include Catfish Beach, the jetties, and the Eastshore Zone. On Butt Valley Reservoir, a potential developed angler access area may be considered at the northern end of the reservoir, near the Butt Valley Powerhouse and at the southern area next to Butt Valley Dam. Along the Project river reaches, potential areas for improved angler access include areas adjacent to Seneca Bridge, near the gauging station below Belden Forebay Dam, and adjacent to the existing Gansner Bar Campground on Belden Reach.
- Consider providing fish cleaning station(s) at selected locations in the study area. There is currently fairly high demand for fish cleaning stations, especially at sites that receive heavy use from anglers such as Butt Valley Reservoir's Alder Creek DUA/Boat Launch. Fish cleaning stations may be considered on both reservoirs to accommodate this need. At Lake Almanor, potential locations for fish cleaning stations include the two Forest Service boat launches (Almanor and Canyon Dam Boat Launches). At Butt Valley Reservoir, potential locations for fish cleaning stations include Alder Creek

DUA/Boat Launch, or a possible new angler access site at the northern end of the reservoir. Facilities may not be feasible at these locations due to septic leach field siting and operation requirements, water quality concerns, high cost, and high maintenance requirements. Other options may be considered.

- Consider needs identified under the boating section. Since many anglers are boat anglers, consider needs identified in Section E5.2.9.4.1.3—Overall Boating Needs in the Study Area and Section E5.2.3—Reservoir Boating Study.

E5.2.9.4.1.8 Overall Open Space Needs in the Study Area

Overall recreation open space-related supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. Trail use has been discussed previously. General open space activities analyzed include:

- Hunting
- Wildlife/nature observation and photography

Natural forested open space also contributes to aesthetic/visual resource enjoyment for area residents and visitors. Natural open space provides the setting for a primitive experience that is desired by many who live, work, and visit the study area.

Open Space Supply Factors

Important open space-related supply factors to consider are summarized below (see Section E5.1.2—Recreation Facility and Condition Inventory for more detail).

- Much of the land in the study area that is not developed is natural open space used for timber protection, wildlife habitat, and hydropower production. Hunting is allowed on some public lands and private lands with permission. Hunting is also allowed on undeveloped Licensee lands where safe and allowed by DFG.

Open Space Demand Factors

Important open space-related demand factors to consider are summarized below (see Section E5.2.2—Existing Recreation Use for more detail).

- Open space lands, especially along Project river reaches, receive relatively low levels of use because of steep topography, steep cut banks, and dense forest cover. Popular open space areas that tend to receive relatively high use include the area north of the causeway on SR 36 (Lake Almanor), the Catfish Beach area (Lake Almanor), the Southwest Shoreline Access Zone (Lake Almanor), the undeveloped shoreline areas of Butt Valley Reservoir, and various areas along both river reaches.
- Yearly demand for hunting is projected to decrease by 0.90 percent, while demand for wildlife viewing is projected to increase by 1.20 percent. By 2035, demand for hunting may decrease 27 percent, but demand for wildlife viewing will likely increase by 52 percent. This decrease in demand for hunting is further evidenced by decreasing sales in state hunting permits and is a national trend as well. Last Chance Campground tends to receive a higher

level of use by hunters than any other developed campgrounds in the study area due to its more remote location and adjacency to hunting areas.

Open Space Capacity Factors

Important open space-related capacity factors are summarized below (see Section E5.2.5—Recreation Carrying Capacity Analysis for more detail). Significant findings include the following:

- Important capacity considerations in the study area are: the number of areas without road access, the large amount of private land adjacent to the study area (especially around Lake Almanor), and natural and cultural resource concerns and fire hazard concern;
- Hunting-related capacity is limited to specific seasons, specific areas, and within certain harvest limits as established by the DFG; and
- Overall facility and social capacity issues are most likely not limiting factors to open space needs in the study area. However, sensitive ecological and cultural resources found in open space lands do limit capacity. In addition, current land ownership configurations and new planned development on the eastern side of Lake Almanor around Bailey Creek further restricts use of natural open space lands.

Open Space Suitability Factors

Due to the dispersed and undeveloped nature of open space-related recreational use, some areas could have low suitability due to land ownership configurations, future land development, and sensitive ecological or cultural resources.

Summary of Needs

Based on a review of the above factors and indicators, potential options to address overall open space-related needs have been identified in the study area. It should not be assumed that these are proposed PME measures. Site-specific open space-related needs are discussed in Section E5.2.9.4.2—Recreation Facility and Use Area Needs by Site. Potential options to satisfy overall open space-related needs include those listed below.

- Consider maintaining adequate open space buffer lands. When combined with surrounding state and federal lands, an adequate supply of Project land for open space-related recreation activities appears to exist. As some surrounding private areas develop in the future, however, the quantity and quality of the remaining open space may diminish for open space-related recreation activities. Consider planning for long-term retention of open space to meet both future recreational and aesthetic/visual open space needs and wildlife habitat needs. Consider focusing recreation development only in areas that are more highly suitable and maintaining the rest as natural open space to retain a more primitive experience for the overall area, and for trail use, hunting, wildlife observation, and photography activities. Areas to consider maintaining as open space buffer lands include the area north of the causeway on SR 36 (Lake Almanor), currently undeveloped areas of the Lake

Almanor shoreline with steep slopes and poor access, and the western shoreline of Butt Valley Reservoir.

- Consider further limiting dispersed vehicular access to Lake Almanor. Various areas around Lake Almanor provide undeveloped dispersed vehicular access to the reservoir. An official vehicle access area may be considered to minimize ecological and cultural resource impacts. This area could potentially be located in the southwestern shoreline zone of the reservoir from south of Lake Almanor West Community Club to the Canyon Dam Boat Launch/DUA, an already popular vehicular access area. Several designated access roads, including adequate signage and possible trailheads, may be considered in this southwestern zone. All other vehicular access areas around the reservoir may potentially be blocked and disturbed areas rehabilitated.
- Consider providing additional dispersed day use and camping sites on Butt Valley Reservoir. Butt Valley Reservoir currently provides unique opportunities for boat-in and walk-in dispersed use sites. Given the relatively constant pool level (no large drawdowns) and the largely undeveloped western shoreline, it is well suited for potential new dispersed use areas. New undeveloped dispersed camping sites may be considered on the western shoreline of Butt Valley Reservoir, particularly near the dam. A vault toilet with road access may also be considered in proximity of the added sites. In addition, new day use walk-in dispersed sites may also be considered on the western shoreline near the dam. New small roadside pull-outs with trails to

the reservoir may also be considered on the eastern shoreline to improve day use shoreline access.

- Consider providing designated wildlife viewing areas. There are currently no designated wildlife viewing areas in the study area. Due to the increasing demand in wildlife viewing over the next 30 years, these types of areas (watchable wildlife sites) may be considered. A potential location for a watchable wildlife site is north of the causeway on SR 36 (Lake Almanor).

E5.2.9.4.1.9 Overall Whitewater River Recreation Needs in the Study Area

Overall whitewater river recreation-related supply, demand, capacity, and suitability factors are presented below, followed by a discussion of overall needs. General whitewater river activities analyzed include:

- Whitewater boating
- Fishing/wading
- Swimming
- Tubing
- General riverside recreation

Whitewater Supply Factors

Important whitewater-related supply factors to consider are summarized below (see Section E5.2.8—Whitewater Boating Study for more detail).

- Seneca Reach begins below Canyon Dam and runs south approximately 11 miles to Caribou Powerhouse 1 above Belden Forebay.

- Seneca Reach provides dispersed recreation opportunities for hiking and fishing. There are some private mining operations along the reach which limit public use. Access is fairly restricted because of steep, rugged terrain and private in-holdings. A county road runs parallel to Seneca Reach, but is usually well above the steep river canyon below.
- Belden Reach begins below Caribou Powerhouse 1 at Belden Forebay and runs southwesterly approximately 9 miles to the confluence with the east branch of the NFFR near SR 70.
- Belden Reach is much more accessible than Seneca Reach. It runs parallel to Caribou Road (which intersects SR 70).
- Neither the Belden nor Seneca Reaches appears to offer outstanding whitewater boating opportunities when compared to similar runs in the region or state (see Section E5.2.8 for further details).

Whitewater Demand Factors

Important whitewater-related demand factors to consider are summarized below (see Section E5.2.8—Whitewater Boating Study for more detail).

- Whitewater boating flows on either reach are considerably more valuable if they occur at times of the year when fewer other whitewater trips in the region are available. Summer and early fall releases for whitewater would be preferable to boaters. Boaters would also prefer to have releases scheduled on weekends.

- Anglers use the Seneca and Belden Reaches throughout the fishing season, but higher use levels likely occur during summer weekends. Weekend releases for whitewater boating could potentially create conflict between anglers and boaters and would negatively affect the high quality of fishing on these reaches.
- Most anglers tend to fish at Seneca and Belden Reaches more often in the early morning and late evening.
- Swimming is a common recreation opportunity along Belden Reach, particularly in a couple of deeper pools near the Forest Service campgrounds. Flows of 150 to 350 cubic feet per second (cfs) are estimated to be optimal for swimming. Higher flows, in addition to creating potential safety hazards for swimmers, could potentially decrease water temperatures, which could limit the amount of time people stay in the water.
- Swimming is not a significant activity on the steeper Seneca Reach.
- Tubing occurs primarily on short sections of Belden Reach, particularly near the Forest Service campgrounds. Flows of 150 to 250 cfs are estimated to be ideal for safe and enjoyable tubing on the reach. Higher flows could potentially pose significant safety hazards for tubing.
- Swimming and tubing are both warm weather-dependent and would be affected by whitewater flows.
- Camping, hiking, picnicking, and general recreation occur at several defined locations on both reaches, but the heaviest use is associated with the campgrounds along the Belden Reach. These recreation activities are

generally flow-enhanced rather than flow-dependent, so flow levels have few direct effects on quality.

- On the Seneca Reach, a desirable and suitable potential public boater put-in site may be the gauging station below Canyon Dam and boater take-out sites may be the Seneca Bridge or just upstream of the Caribou Powerhouses.
- On the Belden Reach, a desirable and suitable potential public boater put-in site may be the gauging station below Belden Forebay Dam and a boater take-out site may be adjacent to Gansner Bar Campground.

Whitewater Capacity Factors

Important whitewater-related capacity factors are summarized below (see Section E5.2.8—Whitewater Boating Study for more detail).

Significant findings include the following:

- When integrating recreation information with ecological flow needs, considerable attention should be focused on designing whitewater releases to mimic natural high flow events and thus serve various ecological purposes. Historically, higher flow events occurred in winter and spring. Use levels, however, would be lower if flows were provided during winter and spring. Accommodating large volumes of boaters may also be a problem due to narrow, 1-land roads, and minimal parking areas.

Whitewater Suitability Factors

Important whitewater-related suitability factors to consider are summarized below (see Section E5.2.8—Whitewater Boating Study for more detail).

Significant findings are listed below:

- If optimum flows were provided on the Belden Reach during one weekend a month in spring or early summer (when other opportunities are also available), relatively low use levels (less than 10 to 15 boaters per weekend day) could be assumed.
- If optimum flows were provided on Belden Reach periodically during warmer month when fewer other rivers represent good substitutes (one weekend per month in July, August, and September), use would likely triple, compared to spring periods (about 30 to 50 boaters per day).
- If a commercial outfitter decided to use Belden Reach, use could easily double from earlier estimates, and upwards of 100 boaters might use the river each weekend day.
- On Seneca Reach, if boatable flows were provided about one weekend per month during the spring and summer boater would likely not be attracted (less than five boaters per day). However, if the same periodic flows were provided in mid-summer or early fall, particularly in concert with releases on other segments of the NFFR, upwards of 10 to 20 boaters might come to Seneca Reach per day during the release period.

- Recent (2002) whitewater boating releases in the nearby Rock Creek-Cresta Project have attracted large crowds (over 200 boaters). The volume of boaters is higher than many had expected. However, over time, this volume can be expected to decline.

Overall Whitewater Needs

Based on the results of the Whitewater Boating Study (see Section E5.2.8), neither the Seneca Reach nor Belden Reach provides outstanding or unique whitewater boating opportunities. Providing high, out of season whitewater pulse flows also pose potential ecological concerns to the reaches' aquatic resources.

For the Seneca Reach, if optimum whitewater flows were provided during mid-summer or early fall, when whitewater flows are not available on most other resources, it is estimated that 10 to 20 boaters during a weekend day would use the reach. The recreation benefit of providing these flows would benefit only a few users. Initial runs may attract larger numbers of boaters, similar to the Rock Creek-Creston Project experience.

Belden Reach has the potential of having a higher recreation benefit, although not under current conditions, due to the potential of the reach accommodating commercial rafting outfitters. The whitewater boating study report estimates that if a commercial outfitter ran the river during warmer months, when there are few other good substitute whitewater opportunities, upwards of 100 people might use the river each weekend day. Belden

Reach is currently overgrown with brambles (Himalayan blackberry), making the reach undesirable for a commercial rafting outfitter from recreation user experience and outfitter liability perspectives. The impacts and practicality of removing the brambles through physical, flow, chemical, goats, and broadcast burning methods is a concern. None of these measures are believed to be effective, long-term solutions to bramble control based on similar experiences at other Licensee Project facilities.

Under current conditions, if optimum whitewater flows were provided during the warmer months when fewer other rivers represent good substitutes, about 30 to 50 people would boat the river per weekend day. Initial runs may attract larger numbers of boaters, similar to the Rock Creek-Creston Project experience.

Providing high, out of season pulse flows during the summer or fall potentially can affect both fish and macro-invertebrates (i.e., mollusks) in the river. Additional monitoring is needed to fully understand these impacts, if any. Results from ongoing monitoring of whitewater flow releases associated with the nearby Rock Creek–Crest Project should be analyzed before decisions are made on the Belden and Seneca Reaches.

The Licensee reviewed the advantages and disadvantages of providing potential recreational whitewater flows in the Belden and Seneca Reaches. Based on all known considerations at this time, whitewater boating releases in the Belden and/or Seneca Reaches have more negative impacts than benefits.

E5.2.9.4.1.10 Resource Protection and Visitor Management Control Needs Related to Recreation Activities

In addition to the activity needs previously discussed, resource protection and visitor management controls are important in the Project area. Considerations associated with resource protection and visitor management control include:

- Sensitive shoreline ecological and cultural resources should be protected, especially on Lake Almanor, which currently receives vehicular and pedestrian shoreline use in some areas. Some sensitive areas have recently been fenced to limit recreational access impacts, but further actions are anticipated. Vehicular access in the Southwest Shoreline Access Zone at Lake Almanor should be better controlled and enforced. Enhanced enforcement of vehicular access so that use remains above the 4,500-foot (Licensee 1997) high pool elevation, as well as enforcing camping in designated areas only, may be considered.
- As part of a proposed I&E Program in the Draft RRMP, signage and other informational materials may be considered to educate users about the presence of sensitive ecological and/or cultural resources and about minimizing impacts to these resources.
- Various boater safety hazards, including shallow areas and exposed land, should be adequately marked (with buoys or signs) to enhance visitor boating safety on Lake Almanor. Bathymetry maps of Lake Almanor for use by boaters could be developed and could be posted on signs at boat launches and distributed to boaters as pamphlets.

- Additional Plumas County Sheriff's Department patrols may be considered at Lake Almanor to enhance enforcement of on-water laws and ordinances.
- A new Plumas County ordinance banning vehicular use below the 4,500 ft asl elevation of Lake Almanor, with appropriate exceptions, is needed to provide for effective law enforcement.

E5.2.9.4.2 Recreation Facility and Use Area Needs by Site

The previous section addressed overall "big picture" needs in the study area. This section addresses existing and future recreation needs on a site-by-site basis by reservoir. It should be noted that these are not proposed PMEs. As such the word "consider" is used in this section.

Recreation needs are organized and presented below for each recreation resource area by campgrounds, day use/picnic areas, boating-related facilities, trails and interpretation, and undeveloped dispersed use areas. Each site or use area is discussed in detail. Unless specified otherwise, it is assumed that the general character and overall level of development at each site will be consistent with the existing conditions and type of recreation experience. Lake Almanor is discussed first, followed by Butt Valley Reservoir, and then the Seneca and Belden Reaches.

E5.2.9.4.2.1 Lake Almanor

This section discusses specific needs at the various sites and facilities on Lake Almanor including campgrounds, day use/picnic areas, boating-related facilities, trails, interpretive facilities, and dispersed use areas.

Campgrounds at Lake Almanor

Last Chance Campground/Group Camp. Last Chance Campground is a Licensee-operated facility located north of Lake Almanor approximately 4 miles north of the town of Chester. The facility is divided into two units: a family campground area with 12 individual campsites and a group camp area with 13 campsites.

Existing Facility and Use Area Needs

- Consider maintenance of various campground elements including picnic tables, Klamath stoves, water faucets, and playground equipment.
- Consider site improvements to adhere with ADAAG. Based on the current number of campsites, two fully accessible campsites would need to be provided.
- Consider modifying existing toilets to be ADA-accessible and providing accessible access routes.
- Consider providing an outdoor shower.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.
- Consider providing up to six additional campsites to meet future demand. Maintain the same campground character that currently exists.

Relevant Site Information

- On a seasonal basis, capacity utilization at this site was 44 percent. Utilization was also 44 percent for the peak months of July and August and 96 percent for holidays. During the 2001 season, occupancy was greater than 90 percent eight times (7 percent). This site is considered to be approaching capacity.
- This facility is located in a relatively flat area adjacent to Last Chance Creek. Some potential exists for expansion of the existing facilities across the creek while still allowing a buffer.
- The average crowding score at this site is 2.9 (scale of 1 to 9), representing a relatively low visitor perception of crowding.
- This facility is uniquely different that the other reservoir campgrounds and has different use patterns (greater shoulder season use).

Almanor Campground (North and South Units). Both Almanor Campground (North and South Units) are operated by the Forest Service and are located off SR 89 on the west

shore of Lake Almanor. Almanor Campground-North has 49 campsites, while Almanor Campground-South has 53 sites.

Existing Facility and Use Area Needs

- Consider converting campsites in the Almanor Campground-South to accommodate recreation vehicles, including on-site water and electricity. Additionally, consider adding an RV dump station.
- Consider leveling campsite spurs and picnic pads for table, grill, and tent placement.
- Consider widening and leveling main access roads and spurs at Almanor Campground (North and South) to better accommodate longer RVs.
- Consider constructing a short (approximately one-eighth of a mile) paved trail to link existing bike trail with amphitheater and beach.
- Consider constructing shower/flush toilet buildings at Almanor Campground (North and South).
- Consider site improvements to adhere with ADAAG. Based on the current number of campsites, three fully accessible campsites at Almanor Campground-North and four fully accessible campsites at Almanor Campground-South would need to be provided.
- Consider modifying, replacing, or providing other ADA-accessible campground elements including water faucets, toilets, trash receptacles, and access paths.

- Consider redesigning and reconstructing the amphitheater to ADA accessibility standards and provide an accessible restroom and parking area.
- Consider installing improved crosswalks in areas where the LART crosses roads within the campground.
- Consider moving the existing group campsite (currently adjacent to Almanor Rest Area) to the eastern side of SR 89. This facility's relocation has already been identified by the Forest Service (Forest Service 2001b).
- Many or all of the needs listed above will be addressed during a planned reconstruction project (Forest Service 2001b). It is expected that this will occur as pat of a 2006 Capital Improvement Program project, subject to Congressional funding.

Future Facility and Use Area Needs

- Consider providing additional RV/tent campsites (if feasible) to help meet future demand.
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (workday and weekend), capacity utilization of this site was 46 percent. Utilization of this site rose to 61 percent during July and August. Seasonal and peak month utilization of this site fall below the 60 percent seasonal and 80 percent peak utilization capacity thresholds.

Utilization of this site exceeded 90 percent on 14 days (11 percent) during 2001.

- Both the north and south units of the Almanor Campground are located in a relatively flat area between SR 89 and the west shore of Lake Almanor. The Forest Service manages land surrounding the current site that could potentially be considered for expansion of the existing facilities. Other Forest Service improvements may include modifying RV sites (the existing camp spurs are too short for RVs); creating ADA-accessible sites; paving trails; and improving internal circulation; improving public access to the amphitheater (Forest Service 2001b).
- The average crowding score at this site is 3.2 (scale of 1 to 9), indicating that visitors feel slightly crowded.
- Current levels of recreational use at this site are approaching capacity during the recreation season and below capacity during peak months. The number of available campsites at this campground is a limiting factor in the long-term. Additionally, this campground is not located on the shoreline, decreasing its popularity with many visitors. The Forest Service plans on renovating and reconstructing this site to protect resources, address ADA needs, and improve public health and safety (Forest Service 2001b).

Lake Almanor Campground (Loops 1, 2, and 3). Lake Almanor Campground, managed by the Licensee, is located on the west shore of Lake Almanor. When originally built, this facility was three separate campgrounds; however, with several expansions, the three

units were combined into one larger unit and the three loops inter-connected years ago. Loop 1 has 68 campsites, Loop 2 has 41 sites, and Loop 3 has 22 sites. There are also a limited number of overflow campsites to the north of Loop 1 (approximately 10 sites) and to the south of Loop 3 (approximately 20 sites).

Existing Facility and Use Area Needs

- Consider constructing an entrance kiosk to serve the three camp loops.
- Consider replacement of older Klamath stoves.
- Consider providing 10 ADA-accessible campsites (four at Loop 1, three at Loop 2, and three at Loop 3), including accessible features such as picnic tables, fire rings, cooking grills, tent or RV areas, and water faucets. In addition, consider retrofitting the eight existing designated accessible campsite to meet current ADAAG guidelines (four at Loop 1, two at Loop 2, and two at Loop 3) and one additional ADA-accessible is needed at Loop 2 and Loop 3 to meet the minimum 10 accessible campsites needed.
- Consider providing accessible paths to the shoreline and provide an accessible swim area.
- Consider retrofitting existing facilities, such as the camp library box, telephones, the envelope box at the pay station, and access routes to these features, to meet ADAAG guidelines.
- Consider retrofitting existing water faucets near accessible elements, such as toilets and campsites, to meet ADAAG.

- Consider modifying the surface and slope of the access routes of two of the toilets (near entry and near Site 100) to meet ADAAG (at Loop 2).
- Consider relocating the interior pay station directly across the road on a level, firm, and stable surface (Loop 2) or at the new entrance kiosk.
- Consider converting the existing group site/overflow area south of Loop 3 (area where the LART will be extended) into an expanded day use/swim beach area. Any lost campsites may potentially be relocated to the overflow area north of Loop 1.
- Consider converting overflow area north of Loop 1 into 20 designated RV sites.
- Consider revegetating disturbed areas caused by pedestrian or vehicular traffic.
- Consider providing an indoor shower facility to serve the three loops.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this campground is at 58 percent. This utilization rose to 77 percent during July and August. During the 2001 season, utilization of the campground

exceeded 90 percent on 28 days (22 percent). This site is considered to be at capacity.

- This site had the highest peak month occupancy rate (77 percent) of all developed campgrounds in the study area.
- Physical limitations prevent significant expansion of this campground except in overflow areas.
- The average crowding score at this site is 3.2 (scale of 1 to 9), indicating visitors feel slightly crowded.

Camp Conery Group Camp. Camp Conery Group Camp is a Licensee–operated reservation-only public facility located east of Lake Almanor Dam and inland from the reservoir approximately 0.25 mile. This public facility includes five bunkhouses and accommodates groups of up to 50 persons. It is also available to various organizations by reservation.

Existing Facility and Use Area Needs

- Consider providing one ADA-accessible parking space to adhere to ADAAG.
- Consider providing a new ADA-accessible cabin with restroom.
- Consider repositioning the telephone on the wall of the central group meeting facility so that its height does not exceed ADAAG.
- Consider retrofitting the water faucet near accessible elements to meet ADAAG.
- Consider repairing and resurfacing the access road.

- The seasonal and peak month occupancy thresholds have been exceeded at this site. Consider expanding existing group facilities to provide one additional group reservation area (space for approximately 15 RVs) adjacent to the existing group facilities or adjacent to the Canyon Dam DUA.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- In 2001, Camp Conery was rented 13 out of 15 (87 percent) weeks that it was open to the public and all weeks during the peak months of July and August.
- This facility is located in a relatively flat area away from the Lake Almanor shoreline. While this facility is bordered on the west by a separate private RV campground, some potential exists for expansion of the existing facilities to the south and north. A second option is to locate a new group area adjacent to the Canyon Dam DUA.
- The average crowding score at this site is 2.4 (scale of 1 to 9), representing a relatively low visitor perception of crowding.
- Current recreational use of this group site is at and/or exceeds capacity during the recreation season and peak months. Facility capacity is currently limited at this site because of this high level of use.

Day Use/Picnic Areas at Lake Almanor

Almanor Beach. The Forest Service-managed Almanor Beach is located on the west shoreline of Lake Almanor, adjacent to the Almanor Boat Launch in the Prattville area.

Existing Facility and Use Area Needs

- Consider providing maintenance or replacing the existing vault toilet.
- Consider revegetating disturbed areas caused by pedestrian or vehicular traffic.
- Consider adding two accessible parking spaces to adhere with ADAAG.
- Consider relocating and integrating the existing accessible picnic table with the other picnic tables at this site.

Future Facility and Use Area Needs

- Consider expanding the day use picnic area and swimming beach (Forest Service 1994).
- Consider developing the area around the Prattville jetties to the south of Almanor Beach for picnicking, angler access, and temporary (short-term) boat moorage with up to 45 mooring balls or moorage slips (Forest Service 1994).
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- Swimming/sunbathing and picnicking are some of the most popular activities at the Almanor Beach. Swimming and sunbathing account for 53 percent of use, while picnicking accounts for 27 percent of use at this site.
- On a standardized seasonal basis (weekend and weekday), capacity utilization of this site is at 52 percent. Utilization rose during peak months to 60 percent. Additionally, utilization of this site exceeded 90 percent on 9 days (7 percent). This site is currently considered to be approaching capacity.
- This facility is directly adjacent to the west shoreline of Lake Almanor and is bordered on the northwest by the Almanor Boat Launch. The area surrounding this facility is relatively flat. There is potential for additional parking areas along the access road to the facility and some expansion of existing picnic facilities between this facility and the Almanor Boat Launch.
- The average crowding score at this site is 3.4 (scale of 1 to 9), indicating visitors feel slightly crowded.
- Current recreational use of this site is approaching capacity during the season, but below capacity during peak months. Although the parking area is not fully utilized during the season, facility capacity will likely become a limiting factor at this site in the future.

Almanor Rest Area (SR 89). The Almanor Rest Area (also called the Almanor Picnic Area) is a Forest Service-managed day use site located approximately 10 miles south of

the town of Chester, adjacent to SR 89. Built in 1965, this site serves primarily as a roadside rest stop.

Existing Facility and Use Area Needs

- Consider rehabilitating this site to provide fully accessible orientation, interpretation, and day use.
- Consider redesigning and paving the parking area and adding at least two accessible parking spaces.
- Consider developing individual picnic sites and providing four accessible picnic tables to adhere to ADAAG.
- Consider improving existing water source.
- Consider updating or replacing existing informational signs and relocating the current interpretive sign closer to the toilets and picnic area. In addition, consider adding a kiosk and other interpretive facilities, possibly a visitor contact center.
- Consider revegetating and controlling traffic flow to the adjacent overflow area.
- Consider renaming the facility "Almanor Picnic Area" once Forest Service renovations have been completed (planned for 2006).
- Most of these facility improvements are identified by the Forest Service in their future 2006 Capital Improvement Program renovation plans (Forest Service 2001b).

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- This site is currently used primarily as a rest stop and overflow camping area.
- On a seasonal weekend basis, capacity utilization of this site is at 20 percent. The utilization of this site remained the same during peak months (20 percent). Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future. Visitors are typically in and out quickly.
- The Forest Service plans to renovate the Almanor Rest Area beginning in 2006. Planned renovations include redesigning and paving the parking area, developing individual picnic sites, and adding a kiosk and other interpretive facilities. Additionally, this site would be renamed Almanor Picnic Area. These improvements should help resolve facility impacts at this site.
- Planned improvements and relocation of the Almanor Group Reservation Camp will result in significant physical space for expansion of the Almanor Rest Area, if needed.

Dyer View DUA. The Forest Service-managed Dyer View DUA is located along the west shore of Lake Almanor. This facility functions as a trailhead for the LART, as well as a shoreline beach DUA.

Existing Facility and Use Area Needs

- Consider revegetating disturbed areas caused by pedestrian traffic.
- Consider providing ADA-accessible benches and accessible paths to the benches at this site.
- Consider relocating interpretive signs closer to the LART or providing an accessible path to the signs.
- Consider providing an accessible path to the beach and to the trash receptacle.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached. Additional parking may be needed in the future.

Relevant Site Information

- Swimming and sunbathing are some of the most popular activities at the Dyer View DUA and account for approximately 45 percent of use.
- On a standardized seasonal basis (workday and weekend), capacity utilization of this site is at 31 percent. Utilization rose during peak months to 41 percent. Facility capacity is currently not a limiting factor as utilization is below capacity, but could be in the future.
- This new facility is bordered on the north by Lake Almanor. While the shoreline prevents physical expansion of this site to the north and east, some

potential exists for expansion of existing facilities to the south and west of this facility.

- The average crowding score at this site is 2.7 (scale of 1 to 9), representing a relatively low visitor perception of crowding.

Eastshore Picnic Area. This Eastshore DUA is a Licensee-operated facility located on SR 147 along the eastern shore of Lake Almanor. This site currently functions as a roadside rest and day use picnic area. This site offers scenic vistas of Lake Almanor and Mt. Lassen.

Existing Facility and Use Area Needs

- Consider an alternative use for this facility, such as a group camp. If the site is retained as a picnic facility, consider the actions listed below.
- Consider providing maintenance for the existing picnic tables.
- Consider revegetating disturbed areas caused by pedestrian traffic.
- Consider erosion control measures around trail on hillside.
- Consider providing an improved trail to the shoreline.
- Consider providing five ADA-accessible picnic tables at this site with two of the picnic tables connected to an accessible access route.
- Consider removing or replacing the existing hand pump water spigot and retrofitting to meet ADAAG.
- Consider providing one ADA-accessible parking space near the toilet.
- Consider providing ADA-accessible access routes to the trash receptacles.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- Picnicking is one of the most popular activities at the Eastshore DUA and accounts for approximately 29 percent of use.
- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 35 percent. The utilization actually decreases during peak months to 25 percent. Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future.
- This site is bordered on the west by Lake Almanor and on the east by SR 147. Steep topography limits potential expansion of existing facilities.

Almanor Scenic Overlook. This viewpoint site, managed by the Licensee, is located on SR 147 along the southeast shore of Lake Almanor near Canyon Dam. The site provides a view of Canyon Dam, Lake Almanor, and Mt. Lassen. This site acts primarily as a rest stop and receives very little use related to other day use activities. Visitor stops are typically very brief.

Existing Facility and Use Area Needs

- Consider providing maintenance for the existing vault toilets.
- Consider revegetating disturbed areas caused by pedestrian traffic.

- Consider providing an accessible access route leading to the toilets to adhere to ADAAG.
- Consider providing one accessible parking space to adhere to ADAAG.
- Consider expanding this site to include day use picnicking with five new picnic tables. Also, consider performing vegetative brushing and clearing to restore the views from this site to Canyon Dam, Mt. Lassen, and Lake Almanor.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- The Almanor Scenic Overlook is used primarily as a rest area. All observed use at this site was attributable to rest stop use.
- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 17 percent. The utilization of this site remained the same during peak months (17 percent). Facility capacity is currently not a limiting factor as utilization is well below capacity, but could be in the future.
- This site is bordered on the west by Lake Almanor and on the east by SR 147. Steep topography limits potential expansion of existing facilities to the west and physical limitations prevent significant expansion of existing facilities to the east, north, and south (southern end of Southeast Zone area).

Canyon Dam DUA. Canyon Dam DUA is a Licensee-operated facility located just east of Canyon Dam along the north side of SR 89. This facility provides 19 picnic tables, cooking grills, and an undeveloped swimming beach. Other facilities at this site include two vault toilets and a circular drop-off and parking area with a separate parking lot located farther upslope. The parking area has 45 single-vehicle spaces.

Existing Facility and Use Area Needs

- Consider maintenance or repair of the beach area, picnic tables, and parking area.
- Consider repairing or replacing the large informational sign at the entrance to this site with a kiosk and pull-through drive.
- Consider revegetating disturbed areas caused by pedestrian traffic and around picnic tables.
- Consider providing one accessible parking space adjacent to the landscaped island in the center of the parking area to adhere to ADAAG.
- Consider adding approximately 15 parking spaces to meet current demand.
- Consider retrofitting the water faucets near accessible elements to meet ADAAG and reconnect the water service that has been cut off to the east.
- Consider modifying eight picnic tables to be accessible and providing eight additional picnic tables.
- Considering improving the swim beach with an accessible route and provide a sandy beach.

- Consider potentially adding a group campsite adjacent to this site (only as an alternative to the Camp Conery Group Camp area located nearby).
- Consider providing an outdoor shower.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.
- Consider additional parking (if needed) in the future.
- Consider preserving undeveloped land adjacent to this site for possible future recreation site development, if needed.

Relevant Site Information

- Two of the most active activities at the Canyon Dam DUA are swimming/sunbathing and picnicking. Swimming and sunbathing account for 25 percent of use, while picnicking accounts for 23 percent of use at this site.
- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 65 percent. Utilization decreased during peak months to 63 percent. Additionally, utilization of this site exceeded 90 percent on 7 days (6 percent). This site is currently considered to be approaching capacity.
- This facility is bordered on the north by Lake Almanor and on the south by SR 89. While the shoreline prevents physical expansion to the north, some potential exists for additional parking or DUAs along the access road to the

facility. In addition, some potential exists for expansion of the existing picnic facilities or a new group campsite to the west of the facility.

- The average crowding score at this site is 2.2 (scale of 1 to 9), representing a relatively low visitor perception of crowding. This site had the lowest perceived crowding score of all developed recreation sites in the study area.

Boating-Related Facilities at Lake Almanor

Almanor Boat Launch. The Forest Service-managed Almanor Boat Launch is located on the west shore of Lake Almanor just off SR 89 adjacent to Almanor Campground-North in Prattville. This facility is one of two public, no fee developed boat launches at the lake. Built in 1976, the facility offers opportunities for boating and fishing access. The primary facility at this site is the boat launch, which has two steep, concrete ramp lanes and a wooden courtesy dock. There are a total of 53 parking spaces at this site and restroom facilities

Existing Facility and Use Area Needs

- Consider repairing portions of the access road and parking area.
- Consider revegetating disturbed areas caused by pedestrian and vehicular traffic.
- Consider extending one boat ramp lane so that the launch is useable when the facility is open to the public (currently now plowed in the winter), and provide an accessible boat access ramp in the parking area.

- Consider providing at least two ADA-accessible parking spaces to adhere with ADAAG.
- Consider widening the access route to the restroom to adhere to ADAAG and providing signage indicating the location of accessible facilities at this site.
- Many of these improvements have been incorporated into a Forest Service plan to renovate this site as part of a Cal Boating grant. The planned improvement include resurfacing the boat launch, adding two courtesy docks, repaving parking areas, widening access roads, constructing two ADA-accessible restrooms, improving the septic system, and improving signs. The Forest Service has received grant funding to cover the costs of these renovations (*Red Bluff Daily News* 2001).

Future Facility and Use Area Needs

- Consider providing short-term boat moorage slips or mooring balls between the two existing Prattville jetties, as well as parking and circulation improvements (Forest Service 1994).
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- In addition to boating-related activities, swimming and sunbathing accounted for 41 percent of use at the Almanor Boat Launch.

- The Forest Service has received a Cal Boating grant to resurface the boat launch, add two courtesy docks, repave parking areas, widen access roads, construct two ADA-accessible restrooms, improve the sewer system, and improve signs. Work is expected to occur in 2003. These improvements should help ease facility capacity concerns at this site (*Red Bluff Daily News* 2001).
- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 49 percent. Utilization rose slightly during peak months to 51 percent. Additionally, utilization of this site exceeded 90 percent on 7 days (6 percent).
- Peak month utilization of the Almanor Boat Launch was likely lower than normal in 2001 because the boat ramp was unusable due to low pool levels for much of August and September. Boat launching was observed to be relocating to nearby Canyon Dam Boat Launch/DUA in the summer of 2001. Overall, facility capacity is a limiting factor at this site for two reasons: parking capacity, and, during dry water years, the inaccessibility of the boat ramp at lower pool elevations (toe of ramp is out of the water).
- This facility is located directly south of a large, open, flat area along the shoreline of Lake Almanor; therefore, there is opportunity for physical expansion of the existing facilities.
- The average crowding score at this site is 4.5 (scale of 1 to 9), indicating visitors feel slightly to moderately crowded. This was the highest perceived crowding score of all developed recreation sites in the study area.

Canyon Dam Boat Launch/DUA. The Forest Service-managed Canyon Dam Boat Launch/DUA is located off SR 89 on the south end of Lake Almanor less than one mile from Canyon Dam. Primary activities at this site include boating and fishing access. Boating-related facilities at this site include a concrete boat launch, which has three steep, concrete ramp lanes and a wooden courtesy dock. Other day use recreation elements at this facility include a restroom, vault toilets, a small picnic area with picnic tables and cooking grills and a large, paved parking area (with 13 single vehicle spaces and 51 boat trailer spaces). A paved, accessible fishing access trail has been constructed at this location and will be further extended by the Forest Service in the near future.

Existing Facility and Use Area Needs

- Consider providing maintenance or repairing the picnic tables and cooking grills at this site. In addition, consider replacing the existing vault toilets and providing an accessible access path to adhere to ADAAG.
- Consider revegetating disturbed areas caused by pedestrian traffic.
- Consider relocating the existing accessible parking space closer to the boat ramp and the vault toilet.
- Consider providing at least three accessible picnic tables at this site including two with an accessible access route.
- Consider extending one boat ramp lane so that the launch is useable year-round and consider providing an accessible boat access ramp in the parking area.

- Consider providing approximately 75 additional parking spaces to accommodate existing demand. The seasonal and peak month occupancy thresholds at this site have likely been exceeded and new parking spaces should be added. This capacity could likely be added to the north of the existing parking area or along the access road to the south.
- Many of these improvements, including replacing the vault toilet, replacing the courtesy dock, replacing signage, installing a water system, and extending the ADA-accessible fishing walkway at this site, have been incorporated in a Forest Service plan to renovate this site. The Forest Service has applied for a Cal Boating grant to cover the costs of these renovations (*Red Bluff Daily News* 2001). Renovation is expected in the next few years.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- In addition to boating-related activities, swimming/sunbathing (41 percent) and picnicking (21 percent) accounted for much of the use at the Canyon Dam Boat Launch/DUA.
- The Forest Service has applied for a Cal Boating grant to replace a vault toilet, replace the courtesy dock, replace signage, install a water system, and extend the ADA-accessible fishing walkway at this site. A decision on the grant is

expected in 2002. These potential improvements should help correct existing facility problems.

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 99 percent. The utilization rose during peak months to 113 percent. Additionally, utilization of this site exceeded 90 percent on 19 days (15 percent). This site has exceeded capacity in 2001.
- In 2001, peak month utilization of the Canyon Dam Boat Launch/DUA may have been higher than normal, as this site likely absorbed use from the nearby Almanor Boat Launch and private Lake Almanor West Boat Launch during August when these ramps were unusable (toe of ramps out of the water). Other boat launches were also unusable at this time which likely increased use levels at Canyon Dam Boat Launch/DUA.
- The average crowding score at this site is 3.5 (scale of 1 to 9), indicating visitors feel slightly crowded.
- This facility is located to the north of a cove with a somewhat steep and narrow shoreline that prevents future expansion; however, the area to the north of the existing boat ramp is relatively open. Planned future improvements include the extension (from the north) of the LART to this site, plus vehicle barriers and parking improvements. Some potential exists to the north of this facility for future facility expansion in addition to or in association with the planned trail extension.

North Shore Boat Launch. North Shore Boat Launch is a privately operated resort and boat launch on Licensee-owned land located on the northern shoreline of Lake Almanor near the causeway on SR 36. There are over 130 campsites at this resort, many of which are RV sites. Many of the visitors stay for extended stays. The boat launch at this site can be used by the public for a fee.

Existing Facility and Use Area Needs

- To improve public shoreline access along the northern shoreline of Lake Almanor, especially for residents of Chester, consider providing a new public boat launch and parking area at this site. This potential improvement to the existing site will require relocation of existing resort campsites (22) if the current number of campsites is to remain the same. A separate vehicular entrance to the new boat launch would be needed. Reuse of the adjacent abandoned highway roadbed would serve as this new route. Other related improvements to consider include a new restroom/boathouse, relocation of existing boat slips, fencing, vegetative screening, and signage. New dredging of a boat channel to the new launch site would be required. Potential cultural resource issues would also need to be addressed for this site and for dredging.

Future Facility and Use Area Needs

- Consider periodically monitoring levels to determine if capacity thresholds have been reached.

Relevant Site Information

- This privately operated resort is located near the town of Chester on the northern shoreline of Lake Almanor. Currently, public use of the existing boat launch is allowed for a fee; however, this use is limited due to site capacity constraints including parking. A DUA for resort campers already exists. Some expansion potential exists at the eastern portion of the site; however, the lake is mush shallower in this area. Relocated campsites may potentially be sited in this eastern area and/or on dredged material placed along the shoreline west of the main entrance. The boat launch site should take advantage of the existing channel near the causeway and minimize impacts to the resort operations and facilities.

Non-Motorized Trails at Lake Almanor

Lake Almanor Recreation Trail. The LART is a paved, 10-foot-wide, 9.5-mile-long trail. The trail winds through wooded areas as well as through several lakeshore areas and provides views of Lake Almanor, Dyer Mountain, and Mt. Lassen. The trail passes through public and private property, campgrounds, and near private residences. Several trailheads with interpretive signs provide access to the trail. The Forest Service, Almanor Recreation and Parks District, and Plumas County would like to eventually extend the trail all the way around Lake Almanor (*Red Bluff Daily News* 2001 and Forest Service 1994). It is unknown if this goal is achievable; however, additional trail segments from Chester to the Lake Almanor West area and from the Canyon Dam Boat Launch/DUA to the Almanor Scenic overlook appear feasible.

Existing Facility and Use Area Needs

- Consider additional non-motorized trail segments around Lake Almanor along the western shoreline and in the Chester area including:
  - — Northern extensions of the LART—extensions of this trail to the town of Chester (up to approximately 7 miles) along 1st Avenue and the shoreline may be considered. The Forest Service and Almanor Recreation and Parks District have applied for previous grant funding for this route but was unsuccessful (*Red Bluff Daily News* 2001). Future trail grant applications are expected in the future for this route.
  - — Southern extension of the LART—an extension of this trail (1.5 miles) to Canyon Dam Boat Launch/DUA is underway. The Forest Service has funding to complete this extension (*Red Bluff Daily News* 2001), however, construction has not yet begun (October 2002).
  - — Canyon Dam Boat Launch/DUA to Almanor Scenic Overlook—this trail may be considered in the future to provide linkage between public recreation sites resulting in a continuous trail along the western shoreline with linkage to the town of Chester to the north.
- Consider a future coordinated grant application effort to facilitate the extension of the LART. The Licensee may consider cooperating with the Forest Service and the Almanor Recreation and Park District to help facilitate the extension of the LART across Licensee-owned Project lands surrounding Lake Almanor.

- Consider trail repair along the LART in approximately 20 locations per a Forest Service assessment in 2002.
- Consider ADA improvements to all existing and potential trail sections. Current improvements to consider include trail signage with accessibility information, paved parking areas at trailheads, and accessible parking spaces at trailheads.

Future Facility and Use Area Needs

- Consider continuing the extension of the non-motorized trail around the eastern and northern shorelines of Lake Almanor including:
  - — Almanor Scenic Overlook to the Southeast Shoreline Zone area — this trail may be considered to provide linkage between the Almanor Scenic Overlook, Eastshore DUA (future proposed group camp conversion site), and a proposed future campground/DUA along this segment of the reservoir shoreline.
  - — Southeast Shoreline Zone to the North Shore Campground area — this trail segment is problematic and may not be feasible. Some segments of this potential trail route might utilize an old abandoned Plumas County highway right-of-way (ROW). An alternative trail route may extend northward along the eastern side of the railroad and inland from the reservoir.
  - — North Shore Campground area to the town of Chester — if and when the Collins Pine railroad corridor is abandoned in the future, a "rails to trails"

route across the existing causeway may be considered to provide residents of Chester access to the North Shore Boat Launch area and Catfish Beach.

— Last Chance Campground to the LART loop—this northern trail linkage may be considered to connect Last Chance Campground to the North Shore Boat Launch area along a gravel roadway on the eastern shoreline north of the causeway.

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- The LART is a popular pedestrian and bicycle access area along the western shoreline of the reservoir.
- The Forest Service is currently planning to extend the trail approximately 1.5 miles from its existing southern terminus at the Lake Almanor Campground to the Canyon Dam Boat Launch/DUA.
- The next logical extensions of the LART that might be considered are northward to the town of Chester and southward to the Canyon Dam DUA and Almanor Scenic Overlook.
- Other LART extensions have been discussed to provide a trail loop of the entire reservoir; however, they are problematic and may not be realized in the near future.

Dispersed Shoreline Use Areas at Lake Almanor

The Lake Almanor shoreline provides numerous dispersed recreation use opportunities, both for land- and water-based activities. At least 24 dispersed use sites were identified around the reservoir plus many in the Southwest Shoreline Access Zone area. The locations of these dispersed sites are shown in Figure E5.1-2—Dispersed Recreation Sites in the UNFFR Project Vicinity.

Existing Facility and Use Area Needs

- Consider creating a primitive day use and/or camping area near Catfish Beach. This would require access across private land.
- Consider further limiting dispersed vehicular access to the shoreline of Lake Almanor below 4,500 ft asl in elevation. A designated shoreline vehicular access area should be considered to minimize water quality, ecological, and cultural resource impacts. This area could potentially be located along the Southwestern Shoreline Access Zone of the reservoir from Lake Almanor West southward to the Canyon Dam Boat Launch/DUA, an already popular vehicular access area. Consider providing several (4) designated gravel access roads with gravel parking access at their terminus along the shoreline at 4,494 to 4,500 ft asl.
- Consider barricading all other vehicular access areas around the reservoir and providing informational signs about available vehicular use areas. A public education program will be necessary if and when existing routes are closed.

- Consider revegetating and rehabilitating disturbed areas and possibly creating trails where roads used to exist.
- Considering enforcing restrictions on future vehicular access below 4,500 ft asl (Licensee 1997). Encourage Plumas County to adopt a new county ordinance that restricts vehicular access below 4,500 ft asl at Lake Almanor, with appropriate exceptions.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- At least 24 dispersed undeveloped recreation sites were documented at Lake Almanor, plus several sites in the Southwest Shoreline Access Zone. Many of the sites are located where spur roads end at or near the reservoir shoreline. Many of these areas are currently used during periods of low water as vehicle access routes.
- Fourteen of the 24 lakeshore sites (58 percent) provide vehicle access to the shoreline.
- Overnight camping occurs at some dispersed sites; however, these sites are not developed campsites and many "No Camping" signs are posted. Signs of overnight use were documented at 12 dispersed sites (50 percent). The

remaining dispersed sites show signs of day use activity only. No water or toilet facilities are available at any of these sites.

- Recent fencing and gating has significantly reduced dispersed use surrounding Lake Almanor. As a result, some of these sites that were mentioned in 2000 are no longer used.
- Sites within the Southwest Shoreline Access Zone were studied in 2002. Eight access routes were identified with associated dispersed sites and shoreline areas used by vehicles. Some of these routes have been barricaded by the Forest Service.

E5.2.9.4.2.2 Butt Valley Reservoir

This section discusses specific needs at the various sites and facilities on Butt Valley Reservoir including campgrounds, day use/picnic areas, boating-related facilities, trails, interpretive facilities, and dispersed use areas.

Campgrounds at Butt Valley Reservoir

Ponderosa Flat Campground. Ponderosa Flat Campground is located at the north end of Butt Valley Reservoir, on Prattville–Butt Reservoir Road (CR 305), approximately 4 miles south of SR 89. This facility has 61 campsites and an overflow camping area with 20 campsites.

Existing Facility and Use Area Needs

- Consider providing increased maintenance at water faucets and older Klamath stoves.
- Consider modifying four campsites to be ADA-accessible. All of the elements provided in the campsite, such as the picnic table, fire ring, cooking grill, tent or RV area, and water faucet, should be accessible. In addition, consider retrofitting the existing designated accessible campsites to be accessible per ADAAG.
- Consider providing an ADA-accessible access route to the restroom near Site # 45.
- In the overflow area, consider replacing the existing vault toilets with a new restroom or dual vault toilet that is accessible. In addition, consider modifying all other existing designated accessible toilets to meet ADAAG.
- Consider providing one ADA-accessible parking space near the toilets.
- Consider providing one ADA-accessible swimming area at the campground shoreline.
- Consider providing ADA-accessible fishing access trails and piers or platforms next to the Ponderosa Flat Campground overflow area and near the powerhouse and levee.
- Consider providing an outdoor shower.

Future Facility and Use Area Needs

- Consider providing an additional 10 to 20 new campsites to meet future demand. Based on survey responses, these sites should be primitive campsites.
- Consider converting the existing overflow area into an RV group camp.
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 51 percent. Utilization rose during peak months to 61 percent. Additionally, utilization of this site exceeded 90 percent on 8 days (6 percent). This site is currently considered to be approaching capacity.
- This facility is situated in a large, flat area along the eastern shoreline of Butt Valley Reservoir. Potential exists for expansion of existing facilities to the north of the campground overflow camping area.
- The average crowding score at this site is 4.3 (scale of 1 to 9), indicating visitors feel slightly to moderately crowded. This site may be exceeding its social capacity, partly due to its design, size, and lack of vegetative buffer between campsites.

Cool Springs Campground. Cool Springs Campground is located on Prattville–Butt Reservoir Road (CR 305) on the east shore of Butt Valley Reservoir approximately 2.5

miles south of Ponderosa Flat Campground. This facility has 30 campsites. Activities at this site include camping, fishing, resting/relaxing, sunbathing, walking/hiking, and swimming.

Existing Facility and Use Area Needs

- Consider providing increased maintenance at pay stations, older Klamath stoves, and the water faucets.
- Consider revegetating areas of bare ground around picnic tables.
- Consider providing one new ADA-accessible campsite (two campsites are already accessible) at this campground. All of the elements provided in the campsite, such as the picnic table, fire ring, cooking grill, tent or RV area, and water faucet, will be accessible.
- Consider retrofitting the water faucets near accessible elements to meet ADAAG.
- Consider providing an outdoor shower.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 35 percent. Utilization rose during peak months to 49 percent.

Additionally, utilization of this site exceeded 90 percent on 4 days (3 percent). This site is currently considered to be below capacity.

- This facility is situated on a flat area along the shoreline of Butt Valley Reservoir. Potential exists for expansion of existing facilities.
- The average crowding score at this site is 3.7 (scale of 1 to 9), indicating visitors feel slightly crowded.
- Current use of this site is below capacity during the recreation season and peak months. Utilization of this site exceeded capacity on a few occasions. In the long-term, facility capacity is a limiting factor at this site.

Day Use/Picnic Areas at Butt Valley Reservoir

Alder Creek DUA/Boat Launch. The Alder Creek DUA/Boat Launch is located along the east shore of Butt Valley Reservoir on Prattville–Butt Reservoir Road (CR 305), approximately 1 mile south of Ponderosa Flat Campground.

This facility provides three picnic sites, a vault toilet, and a paved parking area (20 spaces). Activities include picnicking, boating, and fishing. DUA facilities are detailed below.

Existing Facility and Use Area Needs

- Consider providing a small fish cleaning station at this site.
- Consider providing one ADA-accessible parking space near the toilet.
- Boat launch needs are discussed separately (including parking).

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekend and weekday), capacity utilization of this site is at 69 percent. Utilization decreased slightly during peak months to 64 percent. Additionally, utilization of this site exceeded 90 percent on 10 days (8 percent). This site is currently considered to be exceeding capacity.
- This facility is situated on the eastern shoreline of Butt Valley Reservoir between the two campgrounds. Potential exists for minor expansion of existing facilities near the shoreline. Additional parking expansion would need to occur across the county road and southward.
- The average crowding score at this site is 2.7 (scale of 1 to 9), representing a relatively low visitor perception of crowding.

Boating-Related Facilities at Butt Valley Reservoir

Alder Creek DUA/Boat Launch. The Alder Creek DUA/Boat Launch is located along the east shore of Butt Valley Reservoir on Prattville–Butt Reservoir Road (CR 305), approximately 1 mile south of Ponderosa Flat Campground. This non-ADA-accessible boat launch facility provides a single-lane concrete boat ramp, a vault toilet, and a paved parking area (20 spaces). There is no courtesy dock at this site. Activities include picnicking, boating, and fishing. Boat launch needs are discussed below.

Existing Facility and Use Area Needs

- Consider providing a fish cleaning station at this site if feasible. Due to the proximity to the shoreline, leach fields would need to be located uphill and away from the shoreline and creek.
- Consider modifying the existing boat launch to adhere to ADAAG.
- When major renovation is needed, consider potentially reconstructing the boat ramp to provide for a steeper angle (approximately 14.5 degrees) to improve boat launching capabilities for standard-sized vehicles. This action would require dredging and excavation. A future feasibility study would need to address this potential action if considered further.
- Consider providing a second parking area with space for approximately 10 to 20 vehicles with trailers to meet current demand. The parking area would need to be located across the county road.
- Consider paving the county road (CR 305) from Ponderosa Flat Campground to Alder Springs DUA/Boat Launch. This paving would eliminate dust that accumulates on boats while being trailered to the site.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- Fishing is the most popular activity at Butt Valley Reservoir and boat fishing likely accounts for much of the use of the Alder Creek DUA/Boat Launch. This site provides the only developed boat ramp to launch boats on the reservoir.
- Due to the current slope of the boat ramp, some lower profile vehicles currently have trouble launching boats at this site. These vehicles must enter farther into the water to launch a boat compared to most higher profile vehicles.
- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 69 percent. Utilization decreased during peak months to 64 percent. Additionally, utilization of this site exceeded 90 percent on 10 days (8 percent). This site is currently considered to be at or exceeding capacity.
- This facility is situated on the eastern shoreline of Butt Valley Reservoir. Potential exists for some expansion of existing facilities only across the county road.
- The average crowding score at this site is 2.7 (scale of 1 to 9), representing a relatively low visitor perception of crowding.

Non-Motorized Trails at Butt Valley Reservoir

Aside from short user defined trails, primarily used by anglers to access the shoreline near Butt Valley Powerhouse, there are no developed non-motorized trails on Butt Valley Reservoir.

Existing Facility and Use Area Needs

- Consider providing a dirt trail that links the Butt Valley Powerhouse fishing area with Ponderosa Flat and Cool Springs campgrounds.
- Consider providing a trail from the Butt Valley Dam to the old operator's house area.
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Future Facility and Use Area Needs

- Consider providing a new dirt trail that links Cool Springs Campground with the Butt Valley Powerhouse fishing area and Ponderosa Flat Campground.

Relevant Site Information

- There are currently no developed non-motorized trails directly adjacent to Butt Valley Reservoir. Several user-defined angler access trails provide access to the reservoir along the eastern shoreline of Butt Valley Reservoir.

Dispersed Shoreline Use Areas at Butt Valley Reservoir

The Butt Valley Reservoir shoreline provides limited dispersed recreation use opportunities, primarily due to steep topography and blocked road access along the western shoreline. Only three dispersed use sites were identified around the reservoir. The locations of these dispersed sites are shown in Figure E5.1-2—Dispersed Recreation Sites in the UNFFR Project Vicinity.

Existing Facility and Use Area Needs

- Consider providing approximately five boat-in shoreline dispersed campsites on the western shoreline of the reservoir near the dam. Each site could potentially include a tent pad, fire ring, and picnic table. Consider providing a single vault toilet located nearby with road access.
- Consider creating approximately three walk-in shoreline dispersed day use sites near the old dam operator's house on the western shoreline near the Butt Valley Dam. Consider providing a picnic table and fire ring at each site and a single vault toilet nearby (shared with the new dispersed campsites).
- Consider creating approximately three small roadside pull-outs with short shoreline access trails along the eastern shoreline of the reservoir.

Future Facility And Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- Bank fishing is one of the most popular dispersed uses at Butt Valley Reservoir, especially at the northern end of the reservoir. Near the Butt Valley Powerhouse, bank fishing accounts for approximately 88 percent of dispersed use. In the area from the Butt Valley Powerhouse south to Ponderosa Flat Campground, bank fishing accounts for 70 percent of dispersed use.

While not as popular along the southern shoreline of Butt Valley Reservoir, bank fishing nonetheless accounts for nearly 27 percent of dispersed use in the area from Cool Springs Campground south to the Butt Valley Dam.

- Swimming and sunbathing accounted for 30 percent of use at undeveloped dispersed swimming areas on the eastern shoreline of the reservoir, between Cool Springs Campground and the Butt Valley Dam.
- Three potential dispersed recreation areas were identified at Butt Valley Reservoir. These sites are used primarily for fishing access to the reservoir. No signs of overnight use were documented at these sites.
- Dispersed shoreline sites at Butt Valley Reservoir have no facilities.
- Almost all of the dispersed sites at Butt Valley Reservoir are located at the northern end of the reservoir with sites clustered near the reservoir inlet where fishing is known to be good. Each of these sites provides a roadside pullout accommodating between two and five vehicles. There is no vehicle access to the shoreline.

E5.2.9.4.2.3 Project Area River Reaches

This section discusses specific needs at the various sites and facilities along Seneca and Belden Reaches including campgrounds, day use/picnic areas, boating-related facilities, trails, interpretive facilities, and dispersed use areas. The only developed recreation facility on Seneca Reach is North Fork Fishing Trail, above the Caribou Powerhouse 1 near Belden Forebay.

Campgrounds

There are no developed campgrounds along Seneca Reach; however, there are three Forest Service campgrounds along Belden Reach: Queen Lily Campground, North Fork Campground, and Gansner Bar Campground.

Queen Lily Campground. Queen Lily Campground is located on the west branch of the NFFR along Caribou Road off of SR 70, 34 miles west of Quincy (Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Vicinity). Its location along the river makes it ideal for fishing and swimming. This facility provides 12 campsites.

Existing Facility and Use Area Needs

- Consider revegetating disturbed areas caused by pedestrian traffic, especially around campsites, and providing erosion control along user-defined access trails to the river.
- Consider providing two new ADA-accessible campsites at this campground. All of the elements provided in the campsite, such as the picnic table, fire ring, cooking grill, tent or RV area, and water faucet, should be accessible.
- Consider modifying existing designated accessible restroom to meet ADAAG guidelines.
- Consider retrofitting the water faucets near accessible elements to adhere to ADAAG and providing accessible access routes to trash receptacles.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekdays and weekends), capacity utilization of this site is at 58 percent. Utilization increased during peak months to 67 percent. Additionally, utilization of this site exceeded 90 percent on 18 days (14 percent). This site is currently considered to be at or approaching capacity.
- The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. In addition, this facility is directly north of North Fork Campground and just south of a small tributary of the river.
- The average crowding score at this site is 4.4 (scale of 1 to 9), indicating visitors feel slightly to moderately crowded. This was the second highest perceived crowding score of all developed recreation sites in the study area. Use at this site is considered to be exceeding its social capacity.

North Fork Campground. North Fork Campground is also located on the west branch of the NFFR along Caribou Road off of SR 70, 33 miles west of Quincy (Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Vicinity). Its

location along the river makes it ideal for fishing and swimming. This facility provides 20 campsites.

Existing Facility and Use Area Needs

- Consider revegetating disturbed areas caused by pedestrian traffic, especially around campsites, and providing erosion control along user-defined access trails to the river.
- Consider providing one new ADA-accessible campsite (one is already accessible) at this campground. All of the elements provided in the campsite, such as the picnic table, fire ring, cooking grill, tent or RV area, and water faucet, should be accessible.
- Consider retrofitting the water faucets near accessible elements to adhere to ADAAG.
- Consider providing accessible access routes to trash receptacles, the pay station, and the entry sign area.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 55 percent. Utilization increased during peak months to 65

percent. Additionally, utilization of this site exceeded 90 percent on 17 days (14 percent). This site is considered to be at or approaching capacity.

- The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. The area to the south of this facility, however, is relatively flat and is currently utilized as an undeveloped dispersed overflow camping area.
- The average crowding score at this site is 3.4 (scale of 1 to 9), indicating visitors feel slightly crowded. Use at this site is considered to be approaching its social capacity.

Gansner Bar Campground. Located 32 miles west of the city of Quincy, Gansner Bar Campground is located on the west branch of the NFFR along Caribou Road off of SR 70 (Figure E5.1-1—Licensee and Forest Service Public Recreation Sites in the UNFFR Project Vicinity). The campground's location along the river makes it ideal for fishing and swimming. There are 14 campsites at the campground.

Existing Facility and Use Area Needs

- Consider adding approximately 12 campsites to meet demand.
- Consider repairing the existing amphitheater.
- Consider repaving portions of the main access road.
- Consider revegetating disturbed areas caused by pedestrian traffic and providing erosion control along user-defined access trails to the river.

- Consider providing one new ADA-accessible campsite (one is already accessible) at this campground. All of the elements provided in the campsite, such as the picnic table, fire ring, cooking grill, tent or RV area, and water faucet, should be accessible.
- Consider retrofitting the water faucets near accessible elements to adhere to ADAAG and providing accessible access routes to trash receptacles, the pay station, and the entry sign area.
- Consider providing three accessible picnic tables including accessible routes at this site.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- On a standardized seasonal basis (weekday and weekend), capacity utilization of this site is at 64 percent. Utilization increased during peak months to 71 percent. Additionally, utilization of this site exceeded 90 percent on 34 days (27 percent), the most days of any developed campground in the study area. This site is currently considered to be at capacity.
- The location of this facility between the west branch of the NFFR and Caribou Road limits the potential for future expansion of this facility to the east or west. The area to the north of this facility, however, is relatively flat and is

currently utilized as an undeveloped dispersed overflow camping area. Additional campsites should be considered in this area.

- The average crowding score at this site is 3.7 (scale of 1 to 9), indicating visitors feel slightly crowded. Use at this site is considered to be approaching its social capacity.
- Several dispersed campsites are located near the three Forest Service campgrounds. These sites act as overflow sites and also provide a no-fee camping option for some visitors. Some environmental impacts are occurring at these undeveloped dispersed sites along the river.

Day Use/Picnic Areas

There are no developed DUAs along Seneca Reach. There is only one day use/picnic area along Belden Reach, Belden Rest Stop on SR 70.

Belden Rest Stop (SR 70). Belden Rest Stop is operated by the Licensee and is located adjacent to the downstream Belden Powerhouse on the north side of SR 70 in the Feather River Canyon. This site has several functions including being a roadside rest, a trailhead for three trails and a historical interpretive site. There are three recreation trails that may be accessed from this site: Yellow Creek Trail, Indian Springs Trail, and the Pacific Crest Trail (PCT). There are also two historical features at this site: Eby Stamp Mill and Yellow Creek Bridge. Interpretive information on the history of the mill and mining activities in the area is provided.

Existing Facility and Use Area Needs

- Consider repairing the vault toilets, picnic tables, signs, and cooking grills at this site.
- Consider revegetating disturbed areas caused by pedestrian traffic.
- Consider providing at least two ADA-accessible picnic tables with accessible access routes.
- Provide accessible access routes to the gazebo and overlook area next to the creek and to the Eby Stamp Mill historical features.
- Consider removing the two water faucets near the open pavilion.
- Consider providing erosion control on the slope between the parking lot and the upper picnic area.
- Consider relocating the picnic tables down to the parking lot level.

Future Facility and Use Area Needs

- Consider replacement of the vault toilets when major renovation is required.
- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- At Belden Rest Stop (SR 70), the only developed DUA along the Project river reaches, picnicking accounts for 65 percent of use.

- On a seasonal basis, capacity utilization of this site is at 14 percent. Utilization rose during peak months to 24 percent. Use at this site is currently considered to be below capacity overall.
- The location of this facility adjacent to the downstream Belden Powerhouse and along SR 70 limits the potential for future expansion of this facility. In addition, steep topography further limits the potential for future expansion of this facility.

Boating-Related Facilities

There are no developed boating-related facilities along Seneca Reach, Belden Reach, nor Belden Forebay.

Existing Facility and Use Area Needs

- Consider providing a new car-top boat launch on the western shoreline of Belden Forebay near Caribou Village at the existing parking lot by the gate.

Future Facility and Use Area Needs

- Consider possibly creating a boater put-in near the gauging station below Belden Forebay Dam (only if recreational flow releases are provided in the future and vegetative hazards are removed along the reach).
- Consider possibly creating a boater take-out near the existing Gansner Bar Campground (only if recreational flow releases are provided in the future and vegetative hazards are removed along the reach).

Relevant Site Information

- There are currently no developed boating-related facilities on either Seneca or Belden Reach.

Non-Motorized Trails

The North Fork Fishing Trail (NFFT) is the only developed non-motorized trail on either Project river reach. Aside from short user defined trails used primarily by anglers to access the shoreline in many areas, there are no developed non-motorized trails along Belden Reach.

North Fork Fishing Trail. This angler trail at the Caribou Powerhouse 1 extends up the NFFR for approximately 1.5 miles to Butt Creek. The trail crosses along the side of the powerhouse along a narrow metal grate trail with a railing, also referred to as a catwalk. The NFFT can also be accessed near Butt Creek from a steep dirt road.

Existing Facility and Use Area Needs

- Consider providing improved trail access from a trailhead parking area located near the Caribou Village gate (located with a proposed car-top boat launch at Belden Forebay).
- Consider providing new trail signage.
- Consider retrofitting the metal catwalk trail at Caribou Powerhouse 1 above the turbine outlets and widening and improving the trail along the chain-link fence at the powerhouse yard.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels to determine if capacity thresholds have been reached.

Relevant Site Information

- Currently, the NFFT is the only developed non-motorized trail on the Project river reaches. It receives regular use from anglers as an access point to Seneca Reach.

Dispersed Shoreline Use Areas

The Seneca Reach and Belden Reach provide many dispersed recreation use opportunities, especially the Belden Reach. Only a few dispersed sites were identified on Seneca Reach. Approximately 20 dispersed sites were identified along Belden Reach. The locations of these dispersed sites are shown in Figure E5.1-2—Dispersed Recreation Sites in the UNFFR Project Vicinity.

Existing Facility and Use Area Needs

- At the undeveloped dispersed shoreline sites in lower Belden Reach, consider hardening some sites where environmental impacts are occurring and overuse is documented. Consider closing or barricading other sites where use is significantly impacting sensitive resources, such as riparian and wetland habitat. Afterwards, consider monitoring these sites for resource protection compliance and use levels.

Future Facility and Use Area Needs

- Consider periodically monitoring use levels and site impacts.

Relevant Site Information

- Bank fishing is one of the most popular dispersed uses along the Project river reaches, especially Belden Reach. Bank fishing accounted for much of the use at the following dispersed areas: the area north of Gansner Bar Campground (35 percent), the area to the south of North Fork Campground (29 percent), the area between North Fork Campground and Queen Lily Campground (42 percent), the area from Queen Lily Campground to Belden Forebay (28 percent), and the Caribou Powerhouse 1 parking area (60 percent).
- Another popular dispersed use along the Project river reaches is picnicking. Picnicking was one of the more popular activities at the following dispersed areas: the area to the north of Gansner Bar Campground (30 percent), the area from North Fork Campground to Queen Lily Campground (33 percent), and the area from Queen Lily Campground to Belden Forebay (26 percent).
- Along the Belden and Seneca Reaches, no developed swimming/sunbathing areas are provided. However, certain undeveloped dispersed areas do receive swimming and sunbathing use where there are user-made pools, especially on the southern segment of Belden Reach. From Caribou Corners RV Park north to Gansner Bar Campground, swimming and sunbathing accounted for 29 percent of dispersed use.

- Along the segment of Belden Reach south of North Fork Campground, 36 percent of dispersed use is attributable to swimming and sunbathing.
- The potential for new dispersed sites along Project river reaches is limited by their steep topography, limited access, and by private land.
- A few dispersed sites were documented along Seneca Reach. These sites are used primarily for dispersed overnight camping and appear to receive a low level of use. No water, picnic tables, or toilets are available at these undeveloped sites.
- About 20 dispersed recreation sites were documented along Belden Reach. Most of these sites are used primarily for dispersed overnight camping. Some of these sites function as free informal overflow areas for the nearby developed fee campgrounds provided by the Forest Service (Queen Lily, North Fork, and Gansner Bar Campgrounds). Evidence of overnight camping was documented at 16 of the 20 sites (80 percent). The remaining sites show signs of day use only. No facilities are available at these sites, except for some user-defined rock fire rings. Site impacts were observed at several of these unhardened sites.
- Overall, dispersed sites along Belden Reach appear to have a moderate level of use. Undeveloped sites with higher levels of use along Belden Reach include those that are closer to developed campgrounds, and a somewhat secluded but large scenic site.

E5.2.9.4.3 Project-Related Recreation Needs Criteria

This analysis has identified several proposed existing and future recreation needs in the study area. Not all of these needs are considered to be Project-related. In determining which needs are Project-related and which ones are not, this section recommends three criterion for consideration during the relicensing process: direct Project cause, proximity to Project features, and shared recreation provider responsibility. These three criterion are discussed below and are intended to be viewed as a set of considerations that may be helpful in identifying proposed Project enhancements. All three of these criteria listed below should be considered together rather than separately.

E5.2.9.4.3.1 Direct Project Cause

One factor is the cause or type of facility, activity, or use area creating the need. To address this factor, the cause of the need should be identified. Causes of Project-related needs may include recreation use or its impacts, either induced by the attraction of the reservoir (water-based activities and related shoreline use) or by increased access into areas that would not ordinarily have access as a result of Project roads. Activities that are not considered Project-related are assumed to include snow-related activities, hunting, caving, rock climbing, hang gliding, sightseeing, and visitation at adjacent federal and state recreation areas, off-highway vehicle (OHV) use not along the shorelines, and attractions where those areas are the primary destination. Because of the interrelated recreation use between Forest Service and Licensee recreation facilities, future needs in the study area should be coordinated with the Forest Service.

Potential needs (listed previously) that are not considered Project-related include needs specifically related to snow-related activities, hunting, caving, rock climbing, hang gliding, sightseeing, OHV use, and visitation to non-Project regional recreation attractions.

E5.2.9.4.3.2 Proximity to Project Features

A second factor is the geographic proximity of the recreation need to Project features, such as the dams, reservoirs, Project recreation facilities, or within the FERC Project boundary. Needs associated with the Project may be based on proximity to Project features, such as along the shoreline or inside the FERC Project boundary.

E5.2.9.4.3.3 Shared Recreation Provider Responsibility

The study area includes a broad mix of public, private, and Licensee recreation providers. All recreation providers play a unique and important role in providing for the recreational needs of both visitors and residents. The study area also attracts a lot of through-visitors who are travelling between cities (i.e., Chico to Quincy) and between recreation destinations (i.e., Feather River Canyon to Lassen Volcanic National Park). Local motels cater to the through traveler and Project visitor. Private resorts provide needed services to those who want a more urban recreation experience with user comforts or longer-term accommodations. Private entities, such as country/community clubs and some resorts, cater only to their members. The Forest Service and the Licensee provide for the needs of visitors who desire a shoreline RV or tent campground experience, as well as boat launch and shoreline day use needs for these and other users.

Finally, Plumas County has been active in recreation planning at Lake Almanor and has created a special commission to address recreation needs, especially as they relate to trails and other county residence recreation needs. With all of these recreation provider types and recreational visitor types, each entity plays a unique role and service to the public and the local community. As such, each recreation provider meets only a portion of the overall needs in the study area. Each entity has a shared responsibility, either geographically or by facility/activity type.