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YUBA COUNTY WATER AGENCY

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MARYSVILLE, CALIFORNIA 95901-4226
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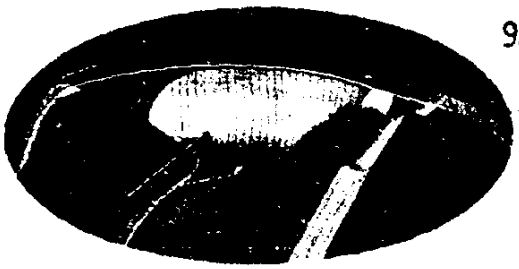

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ORIGINAL

February 22, 1993

Lois Cashell, Secretary
Federal Energy Regulatory Commission
825 Capitol Street NE
Washington, DC 20428

022

RE: Project 2246-007, Exhibit R Revision

Attn: J. Mark Robinson, Director
Division of Project Compliance and Administration

Please find enclosed seven copies of the Agency's Revised Recreation Plan. This Plan is submitted in response to your letter of August 14, 1990 approving the development of a new Plan and the approval of extension of time dated July 29, 1992.

After the Recreation Plan has been approved the Agency will submit the revised Exhibit R Drawings.

If you have any questions on the enclosed Recreation Plan, please call.

Sincerely,

Donn Wilson

Donn Wilson
Engineer-Administrator

cc: Attached list

G2:RecPlan

FERC222

9303050227

List of Addressees:

County Agencies

Yuba County Planning Department
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Marysville, CA 95901

Yuba County Sheriff's Department
215 Fifth Street
Marysville, CA 95901

State Agencies

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California Department of Parks and Recreation
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Sacramento, CA 94296-0001

Mr. Steade Craigo, State Historic Preservation Officer
California Department of Parks and Recreation
P.O. Box 942896
Sacramento, CA 94296-0001

Mr. James D. Messersmith, Regional Manager
California Department of Fish and Game, Region 2
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Rancho Cordova, CA 95670

Mr. Don Waltz, Acting Chief, Boating Facilities Division
California Department of Boating and Waterways
1629 S Street
Sacramento, CA 95814

Secretary for Resources
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Federal Agencies

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P.O. Box 36063
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Mr. Bill Haire, Resource Officer
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Tahoe National Forest
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Camptonville, CA 95922

Mr. Mike Heath, Resource Officer
La Porte Ranger District
Plumas National Forest
P.O. Drawer 369
Challenge, CA 95925

Mrs. Bonnie Petitt, Recreation Specialist
Forest Supervisors Office
Tahoe National Forest
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Mr. Wayne S. White, Field Supervisor
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2800 Cottage Way, Room E-1803
Sacramento, CA 95825

Mr. Douglas Grothe
Park Manager
U.S. Army Corps of Engineers
H. L. Englebright Lake
P.O. Box 6
Smartville, CA 95977

YUBA COUNTY WATER AGENCY

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YUBA RIVER DEVELOPMENT PROJECT

FERC No. 2246

Revised Exhibit R

February 26, 1993

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APPENDICES

1.0 INTRODUCTION

1.1 Purpose and Scope

This Revised Exhibit R for the Yuba River Development Project (Project), Federal Energy Regulatory Commission (FERC) No. 2246, was prepared by the Yuba County Water Agency (Licensee) in response to the August 13, 1985 request by FERC for a revised recreation plan. This report complies with all applicable federal, state, and local regulations and conforms to the recreation study plan filed with FERC on November 19, 1990, supplemented on January 8, 1991, and subsequently approved by FERC on February 4, 1991.

This plan supersedes all previous recreation plans filed with FERC for Project No. 2246 and has been prepared consistent with the current FERC regulations, 18 CFR 4.51 (f)(5).

1.2 Agencies Consulted

The Revised Exhibit R was prepared in consultation with the Downieville District of the Tahoe National Forest (TNF), and the La Porte District of the Plumas National Forest (PNF), U.S. Forest Service (USFS). The USFS is the major federal land and recreation resource management agency in the Project vicinity. Other agencies consulted during the preparation of this report include the California Department of Boating and Waterways, the National Park Service, the California Department of Fish and Game, the California Department of Parks and Recreation, the Yuba County Planning Department, and the Yuba County Sheriffs Department.

1.3 Mission and Goals

Dramatic increases in recreation use at New Bullards Bar Reservoir over the past several years have indicated to Licensee and USFS that there is a need to define the character of recreation experience offered at the Project. Input from the public and management has identified the uncrowded natural experience compared to other reservoirs in California as the most important quality of New Bullards Bar Reservoir. The management mission is to preserve the unique setting and enhance

the recreation experience at the Project while dealing with increasing public desire to use the facilities.

Provided below are specific management goals that will preserve and enhance the unique setting and experience at the Project:

1. Maintaining a relatively undeveloped setting;

2. Maintaining a low level of development visible from the water surface and the shoreline;

3. Maintaining a high visual quality;

4. Creating a feeling of coordinated quality management with minimal but effective regulation necessary to maintain a quality recreation experience that is compatible with the natural and recreational resources of the Project;

5. Managing carrying capacities and resources so that the users' perception is that the reservoir and related recreation facilities are not crowded;

6. Maintaining habitat for healthy fish and wildlife populations;

7. Maintaining a balance of uses so that no one user group is allowed to increase to the point where it displaces other groups, causes excessive conflicts or otherwise dominates the recreation setting;

8. Managing operations and facilities to provide sufficient revenue to be as self-sustaining as possible.

These goals provide direction to ensure a balanced range of opportunities and uses in a setting that provides a feeling of adequate space while minimizing conflicts among user groups and between users and the natural environment.

1.4 Review of Agency Comprehensive Plans

In the preparation of this document, Licensee has reviewed three California Department of Parks and Recreation Comprehensive Publications: Recreation Outlook in Planning District 3 - 1980, Recreation Needs in California - 1982, and the State of California Outdoor Recreation Plan - 1988. In addition, the Land and Resource Management Plans for both the TNF and PNF have been reviewed. During the preparation of this Revised Exhibit R consideration has been given to the recommendations made by these agency plans.

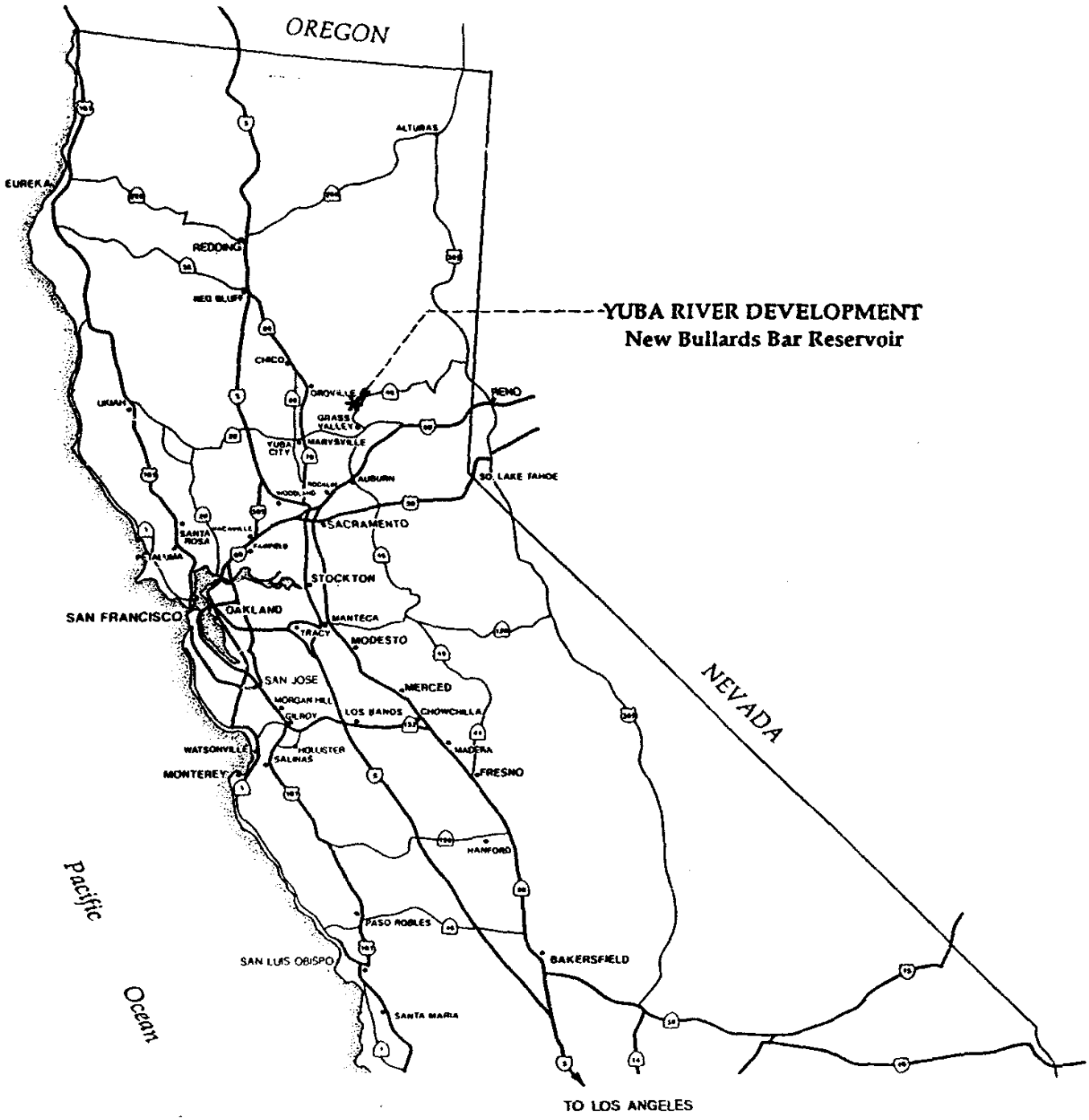
1.5 Area Overview

The Project is located in eastern Yuba County (Figure 1.1) and lies within the Downieville and La Porte Districts of the TNF and PNF, respectively. The Project lies in the northern Sierra Nevada foothills at elevations ranging from approximately 2,000 feet above sea level at Hour House Diversion Dam and New Bullards Bar Reservoir to approximately 350 feet above sea level at Narrows 2 Powerhouse.

Terrain in the area surrounding the Project is dominated by the steep canyons of the North and Middle Yuba Rivers with surrounding narrow valleys and broad ridge tops. Mixed conifers and hardwoods with steep brushy areas are found in the higher elevations while oak-grassland is more prominent in the lower elevations. Soils in the area are primarily highly erosive decomposed granite (USFS, 1990).

The area contains major deer migration routes and winter deer range, and is used year-round by resident bald eagles and osprey. Most rivers and streams support brown and rainbow trout, while reservoirs in the area contain largemouth bass, kokanee salmon and various species of trout.

The single largest Project feature, New Bullards Bar Reservoir, is located on Marysville Road, five miles west of its junction with State Highway 49 two miles west of Camptonville, and three miles east of Challenge. Larger metropolitan areas in the Project region include Oroville, approximately 25 miles north of the Project, Marysville-Yuba City, approximately 35 miles southwest of the Project, and Nevada City-Grass Valley, approximately 11 miles south of the Project. The



REVISED EXHIBIT R
North Yuba Development Project
FERC 2246
Yuba County Water Agency

FIGURE 1.1
PROJECT LOCATION

closest major metropolitan area is Sacramento, population 1.2 million, approximately 55 miles southwest of the Project.

Several all-season county roads and state highways provide access to the Project area. Highway 49 from the Nevada City-Grass Valley Area, Highway 20 and Marysville Road from the Marysville - Yuba City Area, and Forbestown Road and Oregon Hill Road from the Oroville area. Access from the Sacramento Metropolitan area is via Interstate 80 and Highway 49.

1.6 Project Description

The Project is located on the North Yuba River, the Middle Yuba River, and Oregon Creek and is comprised of six main features:

Hour House Diversion Dam - This small diversion dam, located on the Middle Yuba River, diverts water from the Middle Yuba through the 3.7-mile Lohman Ridge Tunnel to the Log Cabin Diversion Dam;

Log Cabin Diversion Dam - A small diversion dam, located on Oregon Creek, that diverts water from Oregon Creek and the Lohman Ridge Tunnel into New Bullards Bar Reservoir via the 1.2-mile Camptonville Tunnel;

New Bullards Bar Dam and Reservoir - This 966,103 acre-foot reservoir is the largest feature of the Project and serves as the only water storage facility. All of the Project recreation facilities are located here. The Reservoir covers 4,809 water surface acres at a maximum water surface elevation of 1,956 feet above sea level;

New Colgate Tunnel - The 4.7-mile Colgate Power Tunnel delivers water from the New Bullards Bar Dam to the New Colgate Powerhouse;

New Colgate Powerhouse - The New Colgate Powerhouse utilizes the 1,306-foot head of water stored and regulated from New Bullards Bar Reservoir to generate 1,245.9 GWh of electricity annually. The generation capacity of the two unit powerhouse is 315 megawatts;

Narrows 2 Powerhouse - The Narrows 2 Powerhouse is located downstream of the U. S. Army Corps of Engineers Englebright Dam and uses regulated releases from New Bullards Bar Reservoir into Englebright Lake to generate 248.4 GWh of electricity annually. This plant has a generation capacity of 46.75 megawatts.

1.7 Recreation Study Methodology

In order to develop the Revised Exhibit R, a comprehensive recreation resource study was conducted for New Bullards Bar Reservoir. A map of the Project Study Area is provided in Figure 1.2. The study was performed by Licensee in cooperation with TNF Staff and consisted of an assessment of recreation opportunities in the foothills region, a natural resource suitability analysis, a recreation user needs analysis, and a carrying capacity analysis.

An assessment of recreation opportunities at comparable reservoirs within 100 miles of New Bullards Bar was completed. The information collected for this study was used to compare recreation opportunities at New Bullards Bar Reservoir with those of other reservoirs in Northern California. The results of this study are in Section 2.1.

The natural resource suitability analysis consisted of an inventory and review of existing natural resource data, provided by USFS Staff, to assess recreation facility development opportunities and constraints within the Project study area. The results of this study are in Section 3.0.

As part of the recreation user needs and carrying capacity analysis, a recreation user survey was conducted on New Bullards Bar Reservoir from May 24, 1991 (Memorial Day Weekend) to October 7, 1991. The study consisted of a mailback questionnaire distributed at developed recreation facilities, personal interviews of shoreline users and boaters, and observations of developed facility occupancy (see appendix A). The results of this study are presented in Section 4.0.

For the analysis of the reservoir recreation carrying capacity, the reservoir was divided into 16 study areas or study zones. User densities, spacing preferences, and sense of crowdedness were recorded for each zone. This information was used to

develop social carrying capacity guidelines for the reservoir surface. The results of this study are presented in Section 6.0.

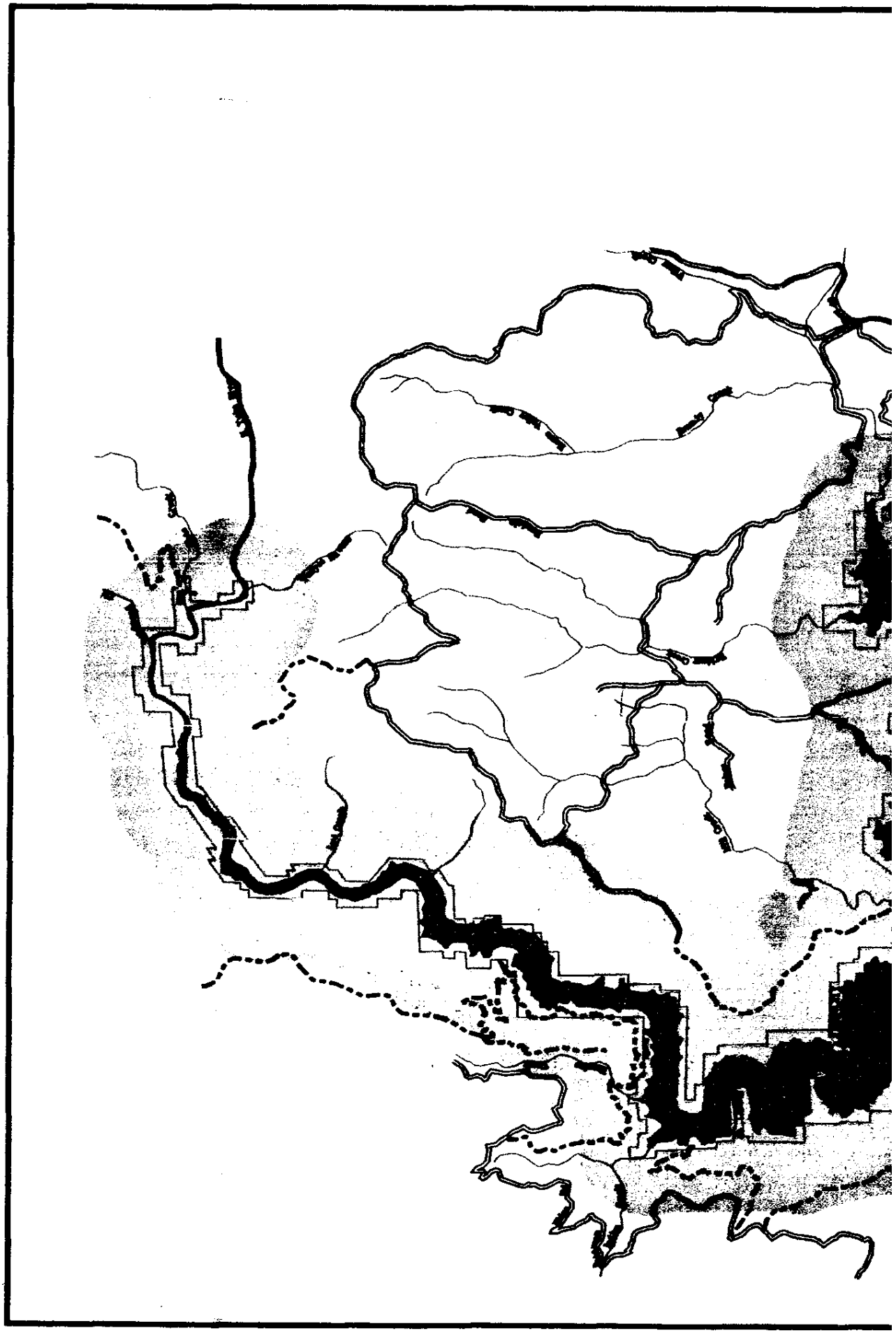
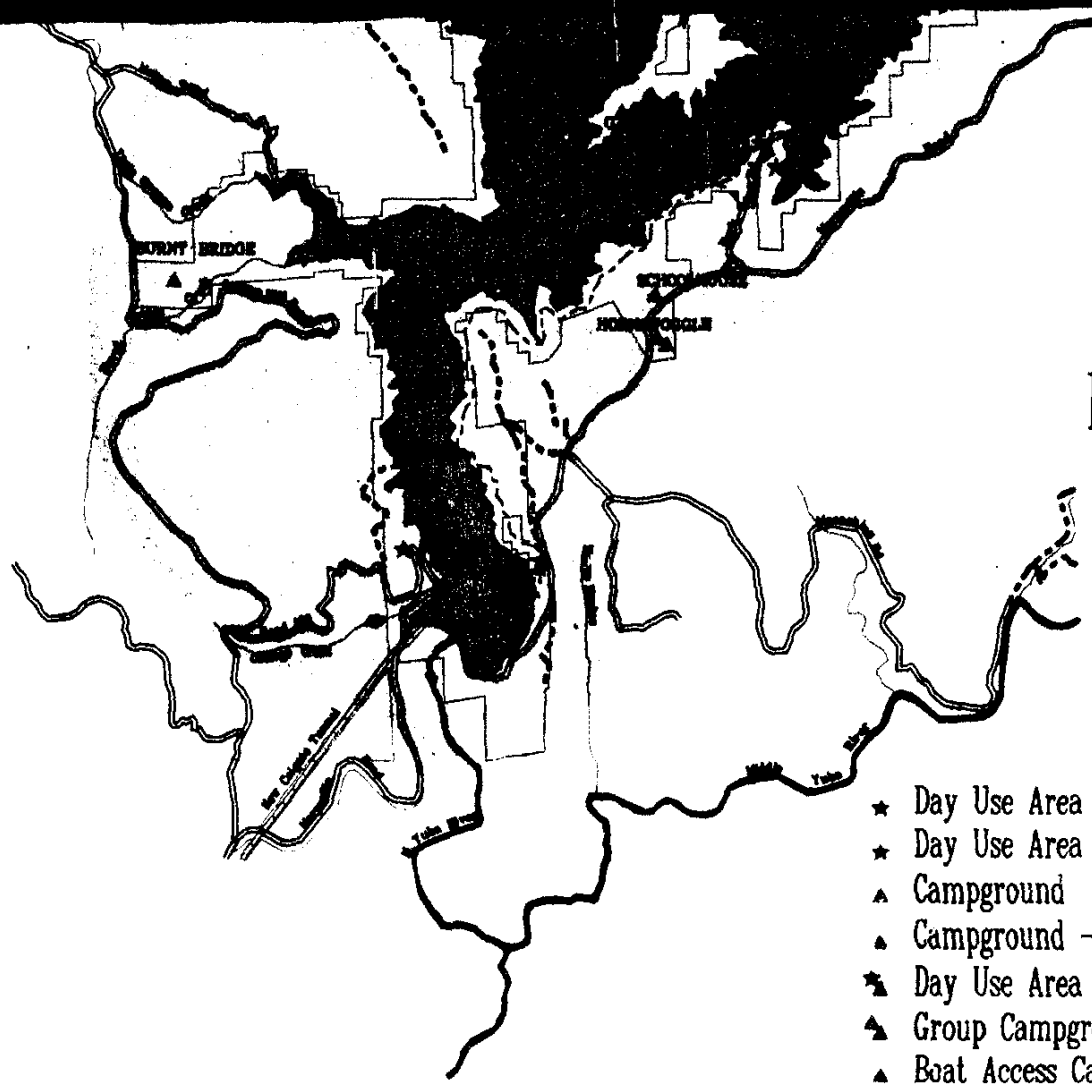


Figure 12

PROJECT STUDY AREA AND RESERVOIR STUDY ZONES



- Day Use Area
- Day Use Area - Closed
- Campground
- Campground - Closed
- Day Use Area and Campground
- Group Campground
- Boat Access Campground
- Boat Ramp

- FERC Boundary
- Recreation Study Zone
- Perennial Stream
- River
- Trail
- Unimproved Dirt Road
- Light Duty Road
- State Highway
- Tunnel
- Pond
- Lake

Recreation Study Area

A-P Study Zone ID

Scale 1:60000

Source: Yuba County Water Agency, USGS

2.0 EXISTING RECREATION OPPORTUNITIES

2.1 Regional Recreation Opportunities

2.1.1 Study Methodology

In order to determine the existing reservoir recreation opportunities in the Sierra foothills region, a study of regional recreation opportunities at reservoirs within 100 miles of New Bullards Bar was performed. Comparable recreation facilities in the area around New Bullards Bar Reservoir were inventoried to determine the types of opportunities provided and their levels of public use. This regional inventory of recreation opportunities was used to identify the unique recreation opportunities available at New Bullards Bar Reservoir.

The identification of regional recreation opportunities began with the selection of all lakes within a 100 mile radius of New Bullards Bar Reservoir. The list of lakes was then reduced to only those lakes located west of the crest of the Sierra Nevada and at an elevation greater than 300 feet above sea level. This process resulted in the selection of over sixty lakes, extending from Eagle Lake at the northern limit to New Hogan Reservoir at the southern limit.

This list of lakes within the region was then further refined by identifying lakes providing recreation opportunities similar to New Bullards Bar Reservoir. The criteria used for identifying reservoirs suitable for comparison, developed in consultation with TNF staff, were: 1) size -- lakes of at least 600 acres surface area; 2) elevation -- lakes generally below an elevation of 5,000 feet; 3) season -- lakes which provide year-round recreation opportunities; and, 4) recreation opportunities -- lakes which provide similar opportunities to those provided at New Bullards Bar Reservoir. This process resulted in the identification of fifteen lakes, described below, which were considered to provide recreation opportunities similar to those provided at New Bullards Bar Reservoir.

2.1.2 Regional Recreation Facilities

Provided below is a description of the fifteen lakes which were identified within the region, outlining the location of the lakes relative to New Bullards Bar, the recreation opportunities provided, and the general level of recreation use. The lakes are listed in order from the northern limit of the region to the southern limit.

Lake Almanor

Lake Almanor, operated by Pacific Gas and Electric Company (PG&E), is located in Plumas County at an elevation of 4,500 feet above sea level. A major feature of the North Fork Feather River watershed, Lake Almanor is accessed from the east and west by Highway 36, and by Highway 89 from the south. The lake is located approximately 100 road miles from New Bullards Bar Reservoir via Highways 49 and 89; via Highways 99 and 36, the distance is about 190 miles.

With 28,000 surface acres of water, Lake Almanor is one of the largest recreation lakes in California. Both PG&E and the Lassen National Forest (LNF) provide recreation facilities: PG&E has constructed 100 tent and RV campsites, as well as a group camp site which can accommodate 40 persons; the LNF provides 101 tent and RV campsites. Private cabins and resorts are also available at sites around the lake.

Lake Almanor provides a full range of recreation opportunities to the public. All types of boats are permitted on the lake. Boating facilities include a marina, berths, docks and improved launching ramps. Boat rentals and water skiing lessons are also available. Water skiing, pleasure boating, fishing and swimming are all popular water related activities at the lake. Hiking, horse riding, winter snow skiing and hunting are also popular recreation pursuits.

Because of different data collection methods used by the recreation providers at Lake Almanor, consistent, comparable data for the entire lake is not available. PG&E data for the 1985-89 period shows a 13 percent decline in tent campers to 3,389 occupied sites in 1989; a 106 percent increase in

recreation vehicles to 6,975; a 69 percent decline in boating to 582 boats in 1989. Overall for the four year period, there was a 61 percent increase in total visitors from 7,190 to 11,590.

Lake Oroville

Lake Oroville is located at an elevation of 900 feet above sea level on the Feather River in Butte County. About four miles east of the City of Oroville, the lake is accessed from Highway 70. Lake Oroville is located about 50 road miles northwest of New Bullards Bar Reservoir, via Highway 70.

Lake Oroville was developed in the 1960s as part of the California Water Project. The Lake Oroville State Recreation Area is operated by the California Department of Parks and Recreation. The lake contains 15,500 surface acres of water and 167 miles of shoreline for water-related recreation. For overnight visitors, the State provides 137 tent and RV campground sites, 75 RV sites, 89 boat-in sites, 50 overflow camp sites, and 28 group sites which will accommodate a total of 275 people. Motel rooms are available nearby in the City of Oroville.

The Department of Parks and Recreation provides an abundance of day use facilities for recreationists at Lake Oroville, including 475 picnic sites, 9 boat ramps with a total of 55 launch lanes, 10 car top boat launches, and two marinas with docks and berths. The lake also features 861 single unit, paved parking spaces and 2,002 double unit paved parking spaces. The State has also constructed a visitor center at the lake.

All types of boats are allowed at Lake Oroville. Water skiing, houseboating, fishing and swimming are all popular water sports. Boat rentals and water ski lessons are available to visitors. Picnicking, hiking, hunting and horse riding are also popular activities.

Over the past ten years, recreation use at Lake Oroville has dropped dramatically. Campground occupancy has declined by 75 percent, while day use attendance is down 29 percent. State officials attribute the decline in use to increased user fees and lower water levels during the drought. During the

1990-91 season, only 3.5 percent of the visitors used overnight camping facilities. Historically, about 10 percent of all visitors were campers. Boating use at Lake Oroville has also declined over the past decade, from 77,700 launches in 1980 to 26,100 launches in 1990. However, the types of boating activities on the lake is estimated to have remained about the same, at about 75 percent skiing use and 25 percent fishing use.

Little Grass Valley Reservoir

Located on the South Fork Feather River at an elevation of 5,040 feet, Little Grass Valley Reservoir is operated by the Oroville-Wyandotte Irrigation District. This remote lake is near the town of La Porte in Plumas County. Little Grass Valley Reservoir is about 40 miles northeast of New Bullards Bar Reservoir via county roads.

Little Grass Valley Reservoir has a surface area of 1615 acres and 16 miles of shoreline. The Plumas National Forest manages 292 tent and RV camp units and has group camping facilities for up to 58 people. Forty-five day use units are also available. All boat types are permitted at the lake. There are three improved boat ramps providing six launch lanes.

Fishing is the most popular boating activity at Little Grass Valley Reservoir, though sailing is also a popular activity with recreationists. Water skiing is not popular because of the relatively cold water compared to other regional lakes. Jet skiing is an increasingly popular activity at the lake. There are currently no houseboats at Little Grass Valley Reservoir, although they are permitted.

Recent trends at Little Grass Valley Reservoir indicate increasing day use and declining overnight use. Recreation facilities are only used to capacity on holiday weekends; use is typically at 70 percent on other weekends. Weekday use is at about 25 percent of capacity.

Sly Creek Reservoir

Sly Creek Reservoir is located on a tributary of the South Fork Feather River in Plumas County. At an elevation of 3,560 feet, Sly Creek is accessed via the same road as Little Grass Valley Reservoir. Sly Creek Reservoir, also operated by the Oroville-Wyandotte Irrigation District, is about 12 miles southeast of Little Grass Valley Reservoir and 30 miles from New Bullards Bar Reservoir.

Sly Creek Reservoir has a surface area of 652 acres with limited facilities for boating and camping. Until two years ago, only primitive camping sites were provided. There are now 32 improved tent and RV campsites available. A concrete boat ramp and a cartop launch have also been added.

Fishing and sailing are the most popular boating activities at Sly Creek Reservoir. Camping has become more popular with the recent improvements. However, as at Little Grass Valley Reservoir, the facilities are only used to capacity on holiday weekends. During non-holiday weekends, use is typically at 70 percent of capacity, while weekday use is at about 25 percent of capacity. In 1990, Sly Creek Reservoir had 5,328 overnight visitor-days and 1,380 day use visitors.

Merle Collins Reservoir

Collins Reservoir is owned by the Browns Valley Irrigation District. Located on Dry Creek in Yuba County, Collins Reservoir is the closest comparable lake to New Bullards Bar Reservoir. The Reservoir is 12 miles southwest of New Bullards Bar Reservoir, at an elevation of 1,200 feet.

Collins Reservoir has a surface area of over 1,000 acres and about 12 miles of shoreline. Privately owned recreation facilities are operated by a concessionaire and include 154 tent and RV campsites, 75 picnic sites and 1 double lane boat ramp. There are about 400 graveled parking spaces at the Reservoir. Houseboats and personal watercraft, such as jet skis, are not permitted. Water skiing is only permitted between May 15 and September 15. During the rest of the year, there is a 20 m.p.h. limit on the Reservoir. There

are also some zones on the Reservoir which are restricted to a 5 m.p.h. speed limit.

The Merle Collins Reservoir Recreation Area includes three large parking lots which provide space for all day use and overnight facilities. Occupancy rates vary widely, from full capacity on holiday weekends to very low during weekdays. Typically, 75 percent of the boating use at the Reservoir is fishing and the remainder is water skiing. The facility operators report no recent changes in either day use or overnight occupancy trends.

Englebright Reservoir

Englebright Reservoir, at an elevation of 517 feet above sea level on the Yuba River, is operated by the U.S. Army Corps of Engineers. Located in a steep canyon which is the border between Yuba and Nevada counties, Englebright Reservoir is about 20 miles east of Marysville. The lake is about 24 road miles from New Bullards Bar Reservoir and about 12 miles downstream.

Englebright Reservoir has a water surface area of 815 acres and a shoreline of 24 miles. The lake features 75 boat-in campsites and 11 picnic sites. There are an additional four picnic sites which are only accessible by boat. The Corps of Engineers owns and operates two boat launching ramps at the lake. In addition, a private concessionaire operates a marina providing boat rentals, houseboat rentals, houseboat moorings, covered boat dock rentals, a sewage disposal station, grocery store, and gas dock.

Because of the steep canyon terrain, most recreation activity at Englebright Reservoir is water related. The Corps of Engineers estimates that the practical use for Englebright Reservoir is 265,000 visitor days, based on the amount of available water surface during the recreation season. They estimate that current use represents 70 percent of capacity.

Jackson Meadows Reservoir

Jackson Meadows Reservoir is located at an elevation of 6200 feet above sea level on the Middle Yuba River along the border between Sierra and Nevada

counties. A somewhat remote lake, Jackson Meadows Reservoir is about 80 miles east of Marysville. Sierraville, the nearest town to the lake, is 25 miles away. Jackson Meadows Reservoir is 40 miles east of New Bullards Bar Reservoir via county roads.

Operated by the Nevada Irrigation District, the lake features 11 miles of shoreline in an area of forested slopes and alpine meadows. There are 159 USFS managed campsites in the Jackson Meadows Recreation Area, as well as five group campsites which can accommodate up to 150 people. Ten boat access campsites are also available. For day use, there are 30 picnic sites. A total of 159 parking spaces are available to the public.

Jackson Meadows Reservoir features two improved boat ramps and two beach areas. All types of boats except houseboats are allowed on the lake. Fishing is the most popular boating activity on the lake, accounting for an estimated 75 percent of all boat traffic. Backpacking, hiking, and horse riding are also popular activities due in part to the lake's alpine location and the proximity of the Pacific Crest Trail.

Recent trends show a decrease in both day use and overnight camping at the lake. While recreation use is estimated to be at about 70 percent of capacity during summer weekends, it is very low during the week and during the off-season.

Scotts Flat Reservoir

Scotts Flat Reservoir, also operated by the Nevada Irrigation District, is located at an elevation of 3,100 feet on Dry Creek, a tributary of the Yuba River. Scotts Flat Reservoir is eight miles east of Grass Valley and 43 miles east of Marysville; from New Bullards Bar Reservoir, it is about 28 miles to Scotts Flat Reservoir via Highway 49.

Scotts Flat Reservoir features over eight miles of shoreline and over 750 surface acres. There are 180 campsites at two different sites along the lake. Two boat launches have also been constructed on opposite sides of the lake. All boat types except houseboats and jet skis are permitted on Scotts Flat

Reservoir. The lake also features a full service marina, boat rentals, a coffee shop, grocery store and bait and tackle shop.

On weekends, about 75 percent of all boating on the lake is in power boats, typically for water skiing. Fishing boats account for about 75 percent of weekday boating. The parking lots are reported to typically be crowded on weekends. Since 1988, the lake has experienced an 11 percent increase in overnight use and a 48 percent increase in day use. Day use visitors now account for a majority of lake visitors.

Rollins Reservoir

Rollins Reservoir, another lake owned by the Nevada Irrigation District, features 825 surface acres of water and a 23 mile shoreline. The lake is 12 miles southeast of Grass Valley and 47 miles east of Marysville. Rollins Reservoir is about 32 miles south of New Bullards Bar Reservoir via Highway 49.

The Rollins Lake Corporation maintains four campgrounds totaling 229 units, 30 of which are boat access only. Four boat ramps are also provided at four different locations around the lake. A full service marina, boat rentals and houseboat moorings are available, as are a snack bar, mini mart and bait and tackle shop. Rollins Reservoir also features 48 picnic sites and two improved beach areas. There are a total of 255 parking spaces at the four developed recreation areas around the lake. Parking can be crowded on summer weekends.

Because of its close proximity to Interstate 80, Rollins Reservoir is a popular destination for day users. The lake is the most popular of the Nevada Irrigation District's three reservoirs included in this study. In 1990, Rollins Reservoir had 51,034 overnight users and 57,983 day users; this represents a 24 percent increase in overnight use and 35 percent increase in day use from the previous year. Picnicking and water skiing are noted as being popular activities at the lake. During seasonal weekends, 75 percent of boaters on the lake are water skiers, compared to 25 percent during the week. A ban on jet skis is being considered because of high insurance costs and limited space.

Camp Far West Reservoir

Located about 25 road miles southeast of Marysville is Camp Far West Reservoir, operated by the South Sutter Water District. Camp Far West Reservoir is at an elevation of 320 feet on the Bear River at the confluence of Yuba, Placer and Nevada counties. The lake features 2,000 surface acres of water and 32 miles of shoreline. Camp Far West Reservoir is about 36 miles southwest of New Bullards Bar Reservoir via county roads.

Camp Far West Reservoir has 106 improved camp units and an overflow area that can accommodate a group of up to 200 people. There are four picnic areas at the lake, each nearby one of two boat launches. A marina featuring rentals, gas and docks is also located near one of the day use sites. A snack bar, grocery store and game room are also available.

All types of boats are permitted on Camp Far West Reservoir, although currently there are no houseboats. Fishing, water skiing and swimming are popular water- related activities on the lake. About 75 percent of weekend boat traffic is water skiers. Jet skiing, which is allowed in specific areas, is increasingly popular.

The level and types of use at the lake vary with water levels. Since 1987 there has been little increase in overnight use, although day use has doubled to 49,700 visitors. Day users now account for twice as many visitors as overnight campers, a reversal of trends from the early 1980s.

Folsom Lake

Folsom Lake State Recreation Area, operated by the California Department of Parks and Recreation at the U.S. Bureau of Reclamation's Folsom Lake, is located at the confluence of the North and South Fork American River in Sacramento and El Dorado Counties. Situated between Interstate 80 and Highway 50, about 20 miles east of downtown Sacramento, Folsom Lake is conveniently located for a large population. Folsom Lake is about 60 miles south of New Bullards Bar Reservoir via Highway 49.

Folsom Lake features 11,450 surface acres of water and 125 miles of shoreline. The Folsom Lake Recreation Area encompasses 18,000 acres with 168 developed camp sites, including 2 boat access camp areas, bicycle camp sites and environmental camp sites. The State also provides four different picnic areas, a full service marina, docks and berths. Boat rentals and windsurfing lessons are also available Private concessionaires also operate a snack bar and bait and tackle shop. Folsom Lake features seven improved boat launches at five different sites around the lake. Hiking, horse riding and bicycle riding are popular non-water related activities at the lake.

No recreation use data was provided for the Folsom Lake Recreation Area.

Union Valley Reservoir

Union Valley Reservoir, operated by the Sacramento Municipal Utility District, is located on Silver Creek, a tributary of the South Fork American River. At an elevation of 4,900 feet in El Dorado County, the lake is accessed via Highway 50. It is 72 miles east of downtown Sacramento via Highway 50, and about 115 road miles southeast of Marysville. From New Bullards Bar Reservoir, it is over 150 miles to Union Valley Reservoir via highways 70 and 50.

Union Valley Reservoir has a surface area of 2,860 acres surrounded by pine and fir forest. The Eldorado National Forest manages 131 campsites at three different locations around the lake. There are also two group campsites which can accommodate 50 people each. The lake also features one picnic site and two improved boat ramps. Other, private facilities are available seven miles from the lake at Ice House Resort.

Union Valley Reservoir is a popular lake for sailing and water skiing. Fishing is also popular by boat and along the shoreline. There has been little overall change in the number of boat launchings since 1981, rising from 2,100 in 1981 to 2,397 in 1990. Boat use has been affected by the drought; In 1984, there were 3,461 launchings while in 1987 there were only 1,100 before the lake was closed due to low water.

Overnight camping has also declined in the past decade, dropping from 114,525 visitors in 1981 to 65,152 in 1990, a 43 percent decrease. During the same period, day use at the picnic site has remained steady. The Eldorado National Forest estimates that day use and overnight facilities operated at 65 percent of capacity in 1991. Typically, there are 15 turn-away days during the recreation season. Overall, the Eldorado National Forest does not consider the facilities at Union Valley Reservoir to be overused.

Pardee Reservoir

Located on the Mokelumne River in Amador and Calaveras counties, Pardee Reservoir is operated by the East Bay Municipal Utility District. With a surface elevation of 568 feet above sea level, Pardee Reservoir features 2,200 surface acres of water and a 43 mile shoreline. About 25 miles east of Lodi, Pardee Reservoir is 100 miles southeast of Marysville via Highways 70, 99 and 12; the lake is about 140 road miles south of New Bullards Bar Reservoir.

Pardee Reservoir is a popular family recreation area, offering a variety of services. The lake features 100 developed tent camp sites and 90 developed RV sites. A group camp site which can accommodate up to 100 people is available. Other facilities include a full service marina, two boat ramps, boat rentals, snack bar, restaurant, grocery store and laundromat.

Because Pardee Reservoir was developed for municipal drinking water supplies, body contact with the water is forbidden. Thus, water skiing, windsurfing and swimming are prohibited. The lake is used for fishing, power boating, sailing and canoeing.

No recreation use data was provided for Pardee Reservoir.

Camanche Reservoir

Downstream of Pardee Reservoir, at an elevation of 236 feet above sea level, is Camanche Reservoir. Also owned by the East Bay Municipal Utility District, Camanche Reservoir is larger than Pardee Reservoir, featuring 7,700 surface acres and 53 shoreline miles. Camanche Reservoir is 12 miles east of Lodi and nearly 130 miles south of New Bullards Bar Reservoir.

Camanche Reservoir includes over 15,000 acres of lands for the recreationist. Included in this area are two resorts with over 1,100 developed tent and RV campsites, two marinas, two boat launch areas with a total of 17 launch lanes, and five picnic areas. A variety of boat rentals, bicycle rentals, tours and equipment classes are available. Other facilities include cottages, motel rooms, tennis courts, riding stables, conference rooms, a general store, coffee shop, amphitheater and a water slide. All types of water sports are allowed at Camanche Reservoir, though water skiing is prohibited in the upper reaches of the lake.

No recreation use data was provided for Camanche Reservoir.

New Hogan Reservoir

New Hogan Reservoir, on the Calaveras River in Calaveras County, is operated by the U.S. Army Corps of Engineers. New Hogan Reservoir is located at an elevation of 713 feet above sea level about 28 miles east of Lodi near Highway 12. The lake is about 100 road miles from Marysville and 140 road miles from New Bullards Bar Reservoir.

New Hogan Reservoir has surface area of 4,400 acres and 50 miles of shoreline. The Corps of Engineers provides 130 improved camp sites, 83 undeveloped sites and one group camp. There are also 130 picnic sites, including a group area. The lake also features four boat ramps with 16 launch lanes, a boat house, a full service marina, a grocery store, a bait and tackle shop, a gas station and docks and moorings. Boat rentals are available and a golf course is located nearby.

All boat types except houseboats are allowed at New Hogan Reservoir. A pumping station will be added in the next five years to permit houseboat use. Water skiing, power boating, jet skiing and fishing are all popular water related activities. Jet skiing is growing rapidly in use and may need to be restricted to specific areas in the future. Bird watching; hiking, horse-back riding and hunting are popular activities.

Over the past decade, the lake has not experienced a significant overall increase in visitors, though the number of visitors has varied notably from year to year. The Corps of Engineers estimates that the drought has caused a 50 percent reduction in lake use. The lake had 203,900 visitors in 1988, the most recent year of recorded data. Weekend use accounts for 48 percent of all visitor use at New Hogan Reservoir. The majority of visitors to the lake are day users. The Corps of Engineers estimates that day use facilities are used to 75 percent of capacity, while camping sites are used to 26 percent of capacity.

Boating activities account for over 50 percent of visitor activities at New Hogan Reservoir. Water skiing accounts for 75 percent of all boating; fishing represents about 25 percent of boating use.

2.1.3 Summary of Regional Recreation Opportunities

This section of the report has documented that there are a number of lakes within 100 miles of New Bullards Bar Reservoir which offer similar recreation opportunities. In fact, the inventory of regional recreation opportunities has shown New Bullards Bar to be a typical northern California, Sierra foothill reservoir. Although New Bullards Bar may provide a unique recreation experience to the visitor, all of these lakes appear to be similar based on the facility data available.

The inventory of regional recreation opportunities has helped to highlight one trend: generally, overnight camping is decreasing while day use is increasing. However, this trend is not true at New Bullards Bar, where both day use and overnight use are increasing (Figure 2.1). While the opportunities provided at New Bullards Bar may be similar to those available at other lakes, New

Bullards Bar is experiencing increased demand, even during a drought. The factors which are influencing public attraction to New Bullards Bar relative to other regional lakes cannot be determined without more detailed user data for all lakes. Unfortunately, such data is not available. The increased demand at New Bullards Bar may be due to a number of factors, including high reservoir levels during drought and low boat densities on the lake.

Figure 2.1

Project Recreation Use

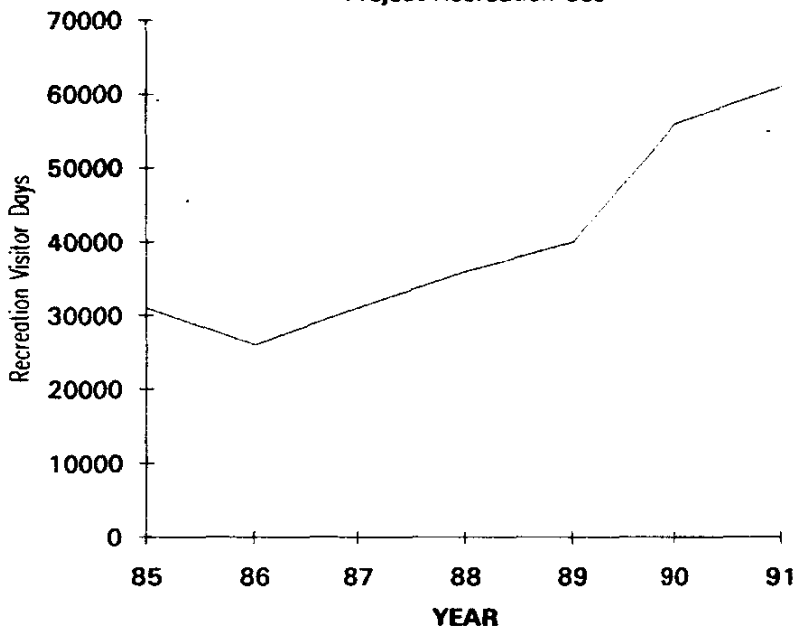


Figure 2.1 based on RIM data collected by TNF 1985-1991.

The lakes included in this study vary in elevation, accessibility, size, amount of development and physical setting. Although each lake provides similar recreation opportunities, it is the setting and relative level of use that makes each lake different. New Bullards Bar provides the visitor with a large lake in a mostly undeveloped, scenic setting, yet with easy road access. The lake is particularly attractive to those seeking motorized boat oriented recreation. New Bullards Bar offers a variety of boating experiences like other lakes, but provides a scenic setting of forests and remote canyons. At New Bullards Bar

Reservoir, a visitor can choose to participate in the activity of their choice in either a developed setting near services or at a remote site offering solitude and a more primitive experience.

2.2 Project Recreation Opportunities

2.2.1 Recreation Facility Management

Licensee has the primary responsibilty for providing recreation facilities at New Bullards Bar Reservoir in accordance with FERC License No. 2246. The TNF has historically operated and maintained all recreation facilities on the reservoir. Recently, USFS budget restrictions have made it necessary to return the recreation operation and maintainence resposibilities to Licensee. Therefore, Licensee currently operates and maintains all Project recreation facilities under USFS Special Use Permit.

In 1990, Licensee and the TNF entered into an agreement in which the TNF would operate and maintain the boat access campgrounds, shoreline camping, and floating toilets. In addition, TNF agreed to regularly patrol the reservoir. Camping permits for all boat access camping would be issued by the Licensees concessionaire, the Emerald Cove Marina (Concessionaire). The fees collected for boat access camping permits were used by Licensee to offset the operation and maintenence costs.

In 1991, the agreement was expanded to cover all Project recreation facilities except the Burnt Bridge Campground which has been closed since about 1980. Schoolhouse, Hornswoggle, and Dark Day Campgrounds and the day use and boat ramp facilities at Dark Day were all put under Special Use Permit to Licensee with the subsequent agreement that the TNF would operate and maintain these facilities and continue the regular patrol of the reservoir.

2.2.2 Recreation Facilitiy Description

A description of the existing recreation facilities at New Bullards Bar Reservoir is provided below.

Burnt Bridge Campground

Burnt Bridge Campground is located approximately 270 feet above the maximum reservoir surface and is about one-half mile from the western shoreline. The facility is off Oregon Hill Road approximately 30 minutes north of New Bullards Bar Dam. The 30-unit campground covers approximately 53 acres of National Forest Land. There is no access road to New Bullards Bar Reservoir from Burnt Bridge Campground.

This facility was closed in 1979 by the TNF, who was then responsible for its operation and maintenance. The campground was closed as a result of low recorded use. The PNF later reopened the campground on a trial basis but closed it again after a year of operation due to low recorded use levels.

This facility is currently closed to all public uses and the access road has been gated.

Cottage Creek Picnic Area

Cottage Creek Picnic Area is located off of County Road 169 approximately 0.5 miles from its intersection with Marysville Road near New Bullards Bar Dam. The 30-unit facility is located on approximately eight acres of TNF land. A steep hillside separates this facility from the southwest corner of the reservoir. County road 169 provides the only access to the reservoir from this facility.

This facility has been closed for a number of years due to low use. It was used by the TNF as a Youth Conservation Corps Camp until 1980. Recently, the TNF has used this facility for overflow primitive camping on weekends and holidays when all other campgrounds in the area are at capacity.

The facility currently has a two-unit vault toilet and electricity is available.

Cottage Creek Boat Ramp

This facility is located along the southwest corner of the reservoir shoreline off of County Road 169 approximately 0.1 mile from its intersection with

Marysville Road and consists of a 900-foot long concrete-paved boat ramp, a four-unit vault toilet, one picnic table, and 56 double (vehicle-trailer) parking spaces. The Emerald Cove Marina, a private concessionaire, is located beside the boat ramp.

Dark Day Picnic Area

The Dark Day Picnic Area is approximately four miles from the New Bullards Bar Dam via Marysville Road and Dark Day Road on the southeast shoreline of the Willow Creek Arm of the reservoir. The picnic area is from 10 to 40 feet above the maximum reservoir surface. The facility consists of 14 picnic units, a four unit vault toilet, and parking for 14 vehicles. Potable water is available.

Dark Day Campground (Formerly Dark Day Picnic Sites 1-16)

The Dark Day Campground is located adjacent to the picnic area on Dark Day Road approximately four miles from New Bullards Bar Dam. The 16 camping units were originally picnic units and were part of the Dark Day Picnic Area. In 1990 the USFS converted the 16 sites to overnight walk-in camping due to the low use they received as picnic sites and the need for more overnight camping in the area.

Prior to their conversion to overnight camping, the sites received a low amount of picnic use due to their location far from the reservoir shoreline. Occupancy rates at these sites have increased significantly since they were converted to overnight camping. These sites are intended for walk-in tent camping only and are not suitable for motorhomes or camper trailers. The facility consists of 16 overnight walk-in camping units with one fire ring and picnic table each, two double unit vault toilets, and parking for 16 vehicles. Potable water is available.

Use of the Dark Day Campground is by reservation only. Reservations are made through the Concessionaire.

Dark Day Boat Ramp

The Dark Day Boat Ramp is located four miles north of New Bullards Bar Dam and three miles south of State Highway 49 via Marysville Road and Dark Day Road. The facility has a three-lane concrete paved boat ramp with track mounted walk-along dock, a four-unit vault toilet, one picnic site with potable water, 80 vehicle-trailer parking units and eight single vehicle parking units.

Hornswoggle Group Campground

This group campground is located on Marysville Road 2.5 miles north of New Bullards Bar Dam and 3.3 miles south of State Highway 49. The facility is approximately 0.75 mile from the southeast shoreline of the reservoir and covers about 33 acres of National Forest Land. The campground consists of five group camp units.

Units 1 (Sugar Pine Group Camp), 3 (Ponderosa Group Camp), 4 (Madrone Group Camp), and 5 (Douglas Fir Group Camp) can each accommodate approximately 25 people while Unit 2 (Manzanita Group Camp) can accommodate approximately 50 people. Each unit is equipped with picnic tables, klamath stoves, fire pit and potable water. In addition, Units 1, 3, and 5 each have a double-unit vault toilet while Units 2, and 4 each have a four-unit flush toilet. Parking capacity for all five units combined is approximately 66 cars.

Use of the Hornswoggle Group Campground is by reservation only. Reservations can be made through the Concessionaire.

Schoolhouse Campground

This campground is located across Marysville Road from the Hornswoggle Group Camp. The campground is approximately 0.5 mile from the reservoir shoreline. Covering 58 acres of National Forest Land, this facility is the largest recreation facility of the Project. The campground has 67 units, four four-unit flush toilets and two double-unit vault toilets. Many of the spurs have been

lengthened through the years. Spur lengths vary from 20 to 50 feet. Potable water is available throughout the facility.

Use of units 41 through 60 is by reservation only. The Concessionaire is responsible for issuing campsite reservations. Use of the remaining 47 units is on a first come, first served basis.

Sunset Vista Point

This scenic overlook is located near the southeast corner of the reservoir approximately one mile north of New Bullards Bar Dam via Marysville Road and Vista Point Road. The facility consists of a four-unit vault toilet, two picnic tables, and parking for approximately 20 vehicles. This facility also serves as a trailhead for the New Bullards Bar Trail.

New Bullards Bar Trail

The 5.5-mile New Bullards Bar Trail begins at the Sunset Vista Point and ends at the Dark Day Picnic Area. The trail follows the eastern shoreline of the reservoir about 60 feet above the high water mark and is connected by a short trail to the Schoolhouse Campground. Motorized vehicles are not permitted.

Administration Site

Although it was included in the original Exhibit R for the North Yuba Development Project, the administration site has not been included in this study. The facility is for official use only by TNF Staff and is closed to the public.

Shoreline Camping and Boat Access Campgrounds

Prior to 1989 undesignated dispersed shoreline camping was not permitted at New Bullards Bar Reservoir. In 1990 the USFS, in cooperation with Licensee, began to allow camping on the reservoir shoreline by permit only. The Concessionaire is responsible for issuing the shoreline camping permits and also rents portable chemical toilets. Licensee and TNF have determined that beginning in the 1992 recreation season, 120 boat access camping permits will

be the maximum number issued per day. One hundred boat access camping permits will be available by advance reservation and 20 will be available on a first come first served basis. Reservations can be made through the Concessionaire. A permit holder may camp at one of the developed boat access campgrounds described below or anywhere along the reservoir shoreline, except at the Dark Day Picnic Area. Permits are issued on a per boat basis, with a base limit of six persons per boat, at a current cost of $7.50. Additional persons are permitted at a current cost of $2.00 per person, up to a maximum of nine people per group. If more than nine persons wish to camp together, an additional permit must be purchased. Anyone camping outside of Madrone Cove and Garden Point Boat-Access Campgrounds is required to have a portable chemical toilet. Shoreline camping is not permitted when the reservoir level is above 1,940 feet above sea level due to potential fire hazard.

There are three boat access campgrounds on the reservoir that were built as part of the original Exhibit R.

Garden Point Boat Access Campground

Garden Point Boat Access Campground is located on a peninsula at the junction of the North Yuba and Willow Creek Arms of the reservoir. The campground is approximately three miles by boat from the Cottage Creek Boat Ramp and 1.5 miles by boat from the Dark Day Boat Ramp. The facility occupies six acres of TNF land and has four double-unit and 12 single-unit campsites. There are four single-unit vault toilets in the campground. Reservations are required and can be made through the Concessionaire.

Frenchy Point Boat Access Campground

Frenchy Point Boat Access Campground is located on the east shore of the North Yuba Arm of the reservoir approximately 4.5 miles by boat from the Cottage Creek Boat Ramp and 4.0 miles by boat from the Dark Day Boat Ramp. The facility occupies three acres of TNF land and has one double-unit and six single-unit campsites. The campground was originally built with seven single campsites; however, one of these had to be abandoned due to severe shoreline erosion around the site. Due to the steep terrain surrounding the

facility, access by users is very difficult, particularly after the reservoir surface drops 10 - 15 feet below the high water mark. Because there is no access road to this site maintenance is difficult as well. A land based chemical toilet had to be removed from the campground. Use at this facility is on a first come first served basis and each group must have a portable chemical toilet.

Madrone Cove Boat Access Campground

Madrone Cove Boat Access Campground is located on the west shore of the upper North Yuba Arm of the Reservoir approximately 7.5 miles by boat from the Cottage Creek Boat Ramp and 6.0 miles by boat from the Dark Day Boat Ramp. This ten-unit campground is on seven acres of National Forest land and has two single-unit vault toilets. There is no access road to this facility and all maintenance must be done by boat. Reservations are required and can be made through the Concessionaire.

Emerald Cove Marina

The Emerald Cove Marina is located directly adjacent to the Cottage Creek Boat Ramp on the north side of the dam. The Marina facility is operated by Licensee's Concessionaire and consists of a floating general store and snack bar, overnight boat slips and mooring buoys, gasoline pumps, and a floating dump station (to service houseboat sanitation systems). Rental houseboats, fishing boats, and patio boats are available.

Houseboats

There are currently 42 houseboats moored year-round on New Bullards Bar Reservoir. All houseboats moored on the reservoir must obtain a houseboat permit from Licensee. In order to obtain a permit, the houseboat must undergo an inspection to verify the safety, cleanliness, seaworthiness, and correct waste water and sewage system of the vessel. The Concessionaire provides and maintains fixed mooring buoys for houseboats stored permanently on the reservoir at a fee of $100.00 per month. The current agreement between Licensee and the Concessionaire allows up to 80 houseboats to be kept on the reservoir.

Boat Slips

The Concessionaire also currently provides and maintains 31 boat slips for small watercraft. The slips are rented on both a monthly and daily basis. The current agreement between Licensee and the Concessionaire allows up to 80 boat slips to be constructed and rented adjacent to the Cottage Creek Boat Ramp.

2.3 Special Designation Areas

There are no designated Wild and Scenic Rivers or Wilderness Areas in the Project area or in the North Yuba River Watershed. However, the North Yuba River has been identified by the USFS as being eligible for designation as a Wild and Scenic River. The USFS is currently evaluating the suitability of the North Yuba River as Wild and Scenic and will submit a recommendation to Congress within the next several years. Upon receiving the USFS recommendation for or against designation, the U.S. Congress will vote on the issue. If legislation designating the North Yuba River as Wild and Scenic is passed into law, an evaluation of the relationship between recreation uses at New Bullards Bar Reservoir and the newly designated Wild and Scenic River may be necessary.

3.0 RESOURCE INVENTORY AND SUITABILITY

3.1 Climate

The Project study area (Figure 1.2) lies in the lower Sierra Nevada at elevations ranging from 1,732 (reservoir minimum pool) to 3,000 (top of North Yuba Canyon) feet above see level. The area experiences a Mediterranean type climate with warm, dry summers (average July temperature 68 degrees Fahrenheit) and cool wet winters (average January temperature 36 degrees Fahrenheit) (Yuba County Planning Department 1981). The area receives approximately 65 inches of rainfall per year. Most of this precipitation occurs during the winter and spring.

3.2 Vegetation

The vegetation type of the Project study area is described as lower montane (Vankat, 1979). Common species of this vegetation type include Ponderosa pine (Pinus ponderosa) incense cedar (Calocedrus decurrens), black oak (Quercus kelloggii), bay laurel (Umbellularia californica) and madrone (Arbutus menziesii). Mixed hardwoods dominate the lower slopes near the reservoir shoreline while conifers dominate the upper slopes and ridge tops. There is increasing evidence of vegetation damage in the Schoolhouse and Dark Day Campgrounds due to heavy use. The study area has been identified by TNF and PNF Staff as having potential habitat for two sensitive plants, Wet cliff Lewisia (Lewisia cantelowii), and Butte Fritillaria (Fritillaria eastwoodiae) (Tahoe National Forest 1991a; Plumas National Forest 1991). The potential habitats for these plants are located at various sites around the reservoir including areas that have already been developed for recreation. There is also potential habitat for the Clustered Lady's Slipper (Cypripedium fasciculatum), a PNF special interest species (Plumas National Forest 1992).

The Project study area has not been field surveyed for any of the above species. However, if any new recreation facilities are planned in the species' potential habitat, field surveys should be conducted and appropriate actions taken to protect these sensitive plants.

3.3 Wildlife

A wide variety of mammals, birds, and fish inhabit the Project study area. Some of the more common species include Columbian black-tailed deer (Odocoileus hemionus columbianus) , raccoon (Procyon lotor), gray squirrel (Sciurus carolinensis), Gray fox (Urocyon cinereoargenteus), mountain quail (Oreortyx pictus), mountain chickadee (Parus gambeli), and stellars jay (Cyanocitta stelleri). TNF staff (1991b) have identified the following as species of special status or concern in the Project study area: bald eagle (Haliaeetus leucocephalus) (endangered), California spotted owl (Strix occidentalis) (sensitive), and osprey (Pandon haliaetus) (maintenance).

3.3.1 Bald Eagle

The U.S. Fish and Wildlife Service (1986) has established a population goal of three breeding pairs of bald eagles at New Bullards Bar Reservoir. Currently, there is one breeding pair of eagles on the reservoir near the Garden Point Boat Access Campground. The USFS (Craig et al. 1991) has recently completed a Draft Habitat Management Plan for the bald eagle on the TNF. The plan identifies a number of habitat management objectives and policies that affect recreation use in the study area. These objectives are listed below.

* Prepare and implement site specific management plans for all known nest sites. Coordinate (the above plan) with Forest Service and other agency recreation plans, since most eagle key habitat areas coincide with high recreation use areas.

* Restrict human disturbances (vehicle, foot, and boat traffic) within 0.25 mile around nest from January 1 to July 15. This buffer should be increased up to 0.5 mile if there is line-of-site vision. Time and distance buffers should be modified according to site-specific conditions.

* Coordinate with Forest Service recreation plans for potential nest areas and winter roost sites.

* Avoid clearcut logging, road building, hiking trails, or boat launch facilities within 0.25 mile of potential nest sites. Other possible sources of disturbance, such as mining operations, campgrounds, boat traffic, etc. should be evaluated on a site-by-site basis.

* Restrict buildings closer than 0.25 mile for the shorelines of winter feeding waters.

There are currently few conflicts between recreation activities and the breeding pair of bald eagles on New Bullards Bar Reservoir. Although no specific sites have been identified, the northwest shoreline of the reservoir near the Burnt Bridge Campground has potential as a future nesting area. TNF and PNF biologists will continue to monitor the situation closely. If any new recreation facilities are planned in known or potential bald eagle nesting/roosting areas, a site specific analysis of the impacts of such development should be performed.

3.3.2 California Spotted Owl

The spotted owl (Strix occidentalis) has three subspecies: Northern, California, and Mexican. Recently, the U.S. Fish and Wildlife Service determined the northern spotted owl to be a threatened species persuant to the Endangered Species Act of 1973. Currently, the California spotted owl is designated a "sensitive species" by Region 5 of the USFS (1984) and a "species of special concern" by the California Department of Fish and Game (Remsen 1978). The Pit River area of Shasta County, California, is the northeast boundary of the California spotted owl's range, separating it from the northern spotted owl. The California spotted owl favors old growth and mature forest habitats but may also be found in younger forests containing preferred structural and vegetation components.

There are two California spotted owl habitat areas in the Project study area. A 676-acre spotted owl habitat area is located on the far eastern edge of New Bullards Bar Reservoir in the Willow Creek Watershed (USFS 1990) and is known to support at least one breeding pair of owls. This area is in a remote portion of the reservoir with no road access. Existing and future recreation uses on the reservoir should not have any impact on spotted own habitat in this area.

There is extensive spotted owl habitat on the west side of the reservoir as well. The Oregon Hill spotted owl habitat area, is located 1/4 mile from the western shoreline of the reservoir and surrounds the Burnt Bridge Campground. If any new recreation facilities in this area are planned, including reopening the existing Burnt Bridge Campground, a complete evaluation of the possible impacts to this spotted owl habitat area will be necessary.

3.3.3 Osprey

Osprey presently nest along the reservoir and are listed as state species of special concern in the Tahoe and Plumas National Forest Plans (USFS 1990; USFS 1988). The forest plans' objective is to maintain the current habitat and allow the osprey to continue its current nesting and foraging patterns. The current recreation activities in the study area do not appear to impact osprey activity or habitat. Any changes in recreation activity or proposed facilities should be evaluated for impacts to osprey.

3.3.4 Deer

Two deer herds, the Downieville and the Mooretown, use the Project study area (USFS 1991). Although year-round deer use occurs throughout the study area, the area is of particular importance because it contains winter habitat. Wagner and Finn (1985) and Snowden (1983) report that due to the recent rapid decline in oak populations on private lands for various reasons, hardwood retention on public lands is critically important to provide winter food supplies for deer. The current recreation activities in the study area do not appear to impact deer activity or habitat. Any changes in recreation activity or proposed facilities should be evaluated for impacts to deer habitat.

3.4 Fisheries

New Bullards Bar Reservoir supports both cold and warm water fisheries. The primary cold water species are kokanee salmon (Oncorhynchus nerka) and rainbow trout (Oncorhynchus mykiss) while the primary warm water species include smallmouth bass (Micropterus dolomieni), spotted bass (Micropterus punctulatus), largemouth bass (Micropterus salmoides), and green sunfish (Lepomis cyanellus).

The California Department of Fish and Game (1991) manages the reservoir primarily for kokanee salmon and releases 220,000 to 250,000 fingerling kokanee a year. Catchable trout were released on an experimental basis with limited results and catchable trout releases were discontinued in 1985. However, the California Department of Fish and Game does occasionally release fingerling rainbow trout. Warm water species tend to reproduce at acceptable levels naturally and are not regularly released.

The California Department of Fish and Game has identified the deterioration of fish habitat due to bank erosion as a concern at New Bullards Bar Reservoir. Increased turbidity around the reservoir shoreline from wave action created by power boats can destroy bass nesting areas along the shoreline. Potential solutions to this problem include more strict enforcement of the 200-foot no-wake-zone (Yuba County Ordinance 8.50.060) around the reservoir shoreline and closing some of the smaller coves to high speed use.

3.5 Soils and Slope

Soils in the Project study area are generally deep to very deep (40 to 80 inches) and well drained with a loam surface layer, clay loam subsoil and weathered granite parent material (USDA 1986). Erosion potential is generally very high due to a combination of the soil composition, slow permeability, and the steep topography of the Project study area. Since the completion of New Bullards Bar Reservoir in 1969, several severe landslides have occurred along the reservoir shoreline.

Most soil types in the Project study area are identified as being severely limited for recreation facility development due to slope and erosion potential. The steep reservoir shoreline provides few areas flat enough for development of recreation facilities. Most of the existing Project recreation facilities are located along ridge tops far above the high water line of the reservoir. Any new recreation development should be carefully sited and engineered in order to minimize erosion, potential landslides, and other impacts.

3.6 Visual Quality

The TNF and PNF have established Visual Quality Objectives (VQO's) for the Project study area (USFS 1990: USFS 1988). VQO's identify different degrees of acceptable alteration of the natural landscape. A description of the standards and guidelines for VQOs is provided below.

* Retention: Provide a natural-appearing landscape where management activities are not visually evident.

* Partial Retention: Provide a natural-appearing landscape where management activities remain visually subordinate.

* Modification: Allow management activities to dominate the landscape; however, keep visual elements comparable to those of natural occurrences.

A majority of the foreground area around New Bullards Bar Reservoir is in the retention VQO. The remainder of the foreground area around the reservoir falls under the partial retention VQO. A majority of the middle and background areas around the reservoir are in the partial retention VQO while the remaining areas are in the modification VQO.

Any new recreation development should be planned to blend with the existing visual character of the surrounding area to minimize visual impacts. In addition, new facilities should be sited in areas that take advantage of protected viewsheds.

3.7 Cultural Resources

At the present time, minimal cultural resource inventory work has been performed in the Project study area (Tahoe National Forest 1991c). The steep terrain of the area suggests few prehistoric resources remain. Historic resources are also felt to be minimal due to the fact that most historic activity took place along the river bars which are currently submerged by the reservoir. If any new recreation facilities are planned, a cultural resource survey would be neccessary prior to facility construction.

3.8 Fire Fuels

Historically, the natural fire regime for the Project study area was considered to be frequent with a return interval of 5 - 10 years (Tahoe National Forest 1991d). Fires of this frequency are generally of low to moderate intensity and fuel loading is maintained on a low to moderate level. Due to increased detection and fire suppression capabilities and changes in land use and management practices over the last 80 years, the current fire regime is best described as infrequent with a return interval of 75 - 100 years. Fires of this frequency are of high intensity and are capable of destroying mature forests.

Fuel loading in the study area ranges from light (5 - 10 tons/acre) to heavy (25 - 35 tons/acre) in the mature mixed conifer stands of the study area. The heaviest fuel loading is located in areas that have been logged and the resulting slash has not been treated or removed. Fuel loading in these areas is very heavy (30 - 60 tons/acre).

The existing fuel situation in the Project study area indicates a moderate to high fire hazard will continue in the future. The USFS plans to burn or remove the heavy slash in harvested areas, significantly reducing the fire hazard in these areas. However, no fire fuel reduction activities are planned for the remainder of the Project study area. The USFS will continue to require campfire permits for shoreline camping. Campfires are prohibited outside of designated areas.

4.0 RECREATION USE SUMMARY AND CONCLUSIONS

The recreation facilities described in Section 2.2 are operated by Licensee in cooperation with the USFS. Licensee, in cooperation with the USFS, conducted a Recreation Use Study to evaluate existing recreation opportunities and determine the appropriate level of recreation development for the area based on existing use levels, user preferences and protection of Project resources.

The following summarizes the results of the 1991 Recreation Use Study. The study surveyed recreational use during the recreation season from May 25 through October 7 at 11 Project recreation facilities, using mailback questionnaires, personal interviews, and observations as data gathering tools. Copies of the questionnaire, interview, and observation forms are in Appendix A. The results include current use levels, an evaluation of user preferences and satisfaction with current facilities, user sense of crowdedness, and user comments. The complete results of the recreation use study are in Appendix B.

4.1 Existing Recreation Use

The survey results indicate high recreation use levels at overnight and boat ramp facilities and low use levels at picnic areas (see Appendix B, Tables B.1, B.2, B.3, B.4, B.5, and B.6). The low occupancy rates at Dark Day Picnic Area and Sunset Vista Point indicate that the existing picnic facilities are adequate. However, occupancy rates at the two boat ramps are consistently over 100 percent on weekends with the heaviest use at the Cottage Creek Boat Ramp. These high occupancy rates suggest that there is demand for additional boat ramp parking.

An estimate of average Reservoir use in Boats At One Time (BAOT) (Table B.7) was made by adding the number of empty boat trailers at each boat ramp to the number of houseboats occupied at the Project. The estimated total number of BAOT is 179 for weekends, 253 for holidays, 80 for weekdays, and 114 seasonal.

Currently, approximately 46 houseboats are moored on New Bullards Bar Reservoir adjacent to the Cottage Creek Boat Ramp. At the beginning of the 1991 survey season there were 36 houseboats stored on the reservoir. Survey results show that the median houseboat user group brings one boat and two vehicles to the reservoir

on a normal outing, which requires three units of parking per group (Tables B.23, B.24). The recreation observation data indicates that houseboat use is about 50 percent on weekends (Table B.20). With approximately 18 - 20 houseboats out on the reservoir on a typical weekend, 60 units of parking are usually required by houseboat users. Because all houseboats are moored adjacent to the Cottage Creek Boat Ramp, nearly all houseboat groups use the Cottage Creek facility for boat launching and parking. This is one cause of the high weekend occupancy rates at the Cottage Creek Facility. The current agreement between Licensee and the Concessionaire sets a maximum limit of 80 houseboats on the reservoir. Demand for parking at the Cottage Creek Boat Ramp is expected to increase substantially as the number of houseboats stored on the Reservoir increases.

Occupancy rates for Schoolhouse and Dark Day Campgrounds are 88 and 75 percent respectively for primary days (weekends and holidays) and 55 and 32 percent respectively for the season (Table B.1). Twenty nine percent of all overnight groups sampled had between seven and twelve persons (Table B.15). The design capacity for these campgrounds is six persons per site. Frequent campground use by large groups is beginning to adversely impact the soil and vegetation resources in the Schoolhouse and Dark Day Campgrounds.

The occupancy rate at Hornswoggle Group Camp is 98 percent for primary days and 48 percent for the season. Field observations made by Licensee and USFS staff indicate that the Hornswoggle Group Camp is not used in the manner in which it was designed. The facility was designed before large motorhomes and camper trailers became popular, and often parking is not sufficient for large vehicles of this type. Many groups with this type of equipment prefer to spend most of their time closer to their vehicles than the existing layout will allow.

Occupancy rates for boat access camping (Madrone Cove, Frenchy Point, Garden Point and dispersed shoreline) are relatively high. However, Licensee and TNF staff suspect that actual occupancy may not be as high as indicated in Tables B.1 and B.2. Significant inaccuracies in the data may be caused by double reporting of the number of boat access camping permits sold by Concessionaire and the difficulty involved in counting the number of shoreline camping groups. TNF staff estimate actual primary day occupancy to be below 90 percent. The high

occupancy rates for boat access camping suggest that there is sufficient demand for additional boat access camping opportunities.

While campground occupancy rates are of some concern, of more concern is the frequency of overnight groups that exceed the six person per site design capacity of the existing facilities (Table B.15).

Boat access camping use characteristics change dramatically with reservoir water levels. When reservoir levels are high, usable space for dispersed shoreline camping is limited and the developed Boat Access Campgrounds (BAC's) are used heavily. As reservoir water levels drop, access to the designated BAC's becomes very difficult due to the steep reservoir shoreline, usable space for dispersed shoreline camping increases substantially, and fewer groups actually use the BAC's. Often a BAC permit holder will camp on the shoreline instead of in the designated campsite.

The most popular activities in the Project study area are water skiing, boat fishing, and pleasure boating (Tables B.28, B.29, and B.30). Forty-six percent of those surveyed listed boat fishing as their primary activity on weekdays while 25 percent of weekday users listed water skiing as their primary activity. On weekends however, 42 percent of the respondents listed water skiing as their primary activity while 28 percent identified boat fishing as their primary activity.

Shoreline use at New Bullards Bar Reservoir (Table B.31) is most concentrated in zones D, G, H, J, and O (Figure 4.1). These figures include both day and overnight uses. These shoreline areas receive the heaviest amounts of use because they contain the largest area of usable shoreline space.

4.2 Recreation User Preferences And Satisfaction

The results of the recreation user preferences and satisfaction survey are provided in Table B.35. The figures in the third and fourth columns are percentages of respondents identifying the element as important or very important and satisfactory or very satisfactory. However, it is important for the reader to note that these percentages do not necessarily reflect the most important or most satisfactory elements to visitors.

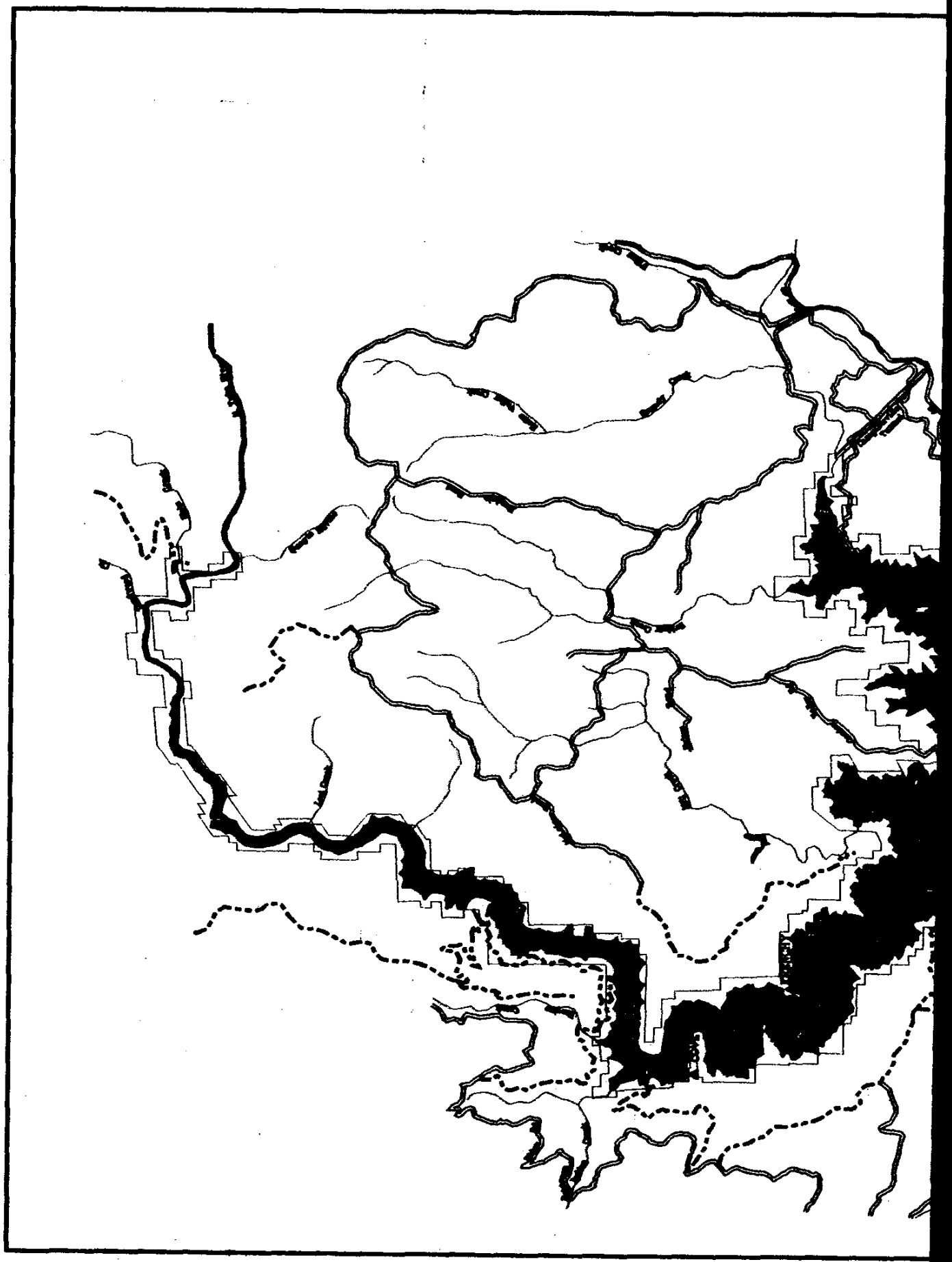
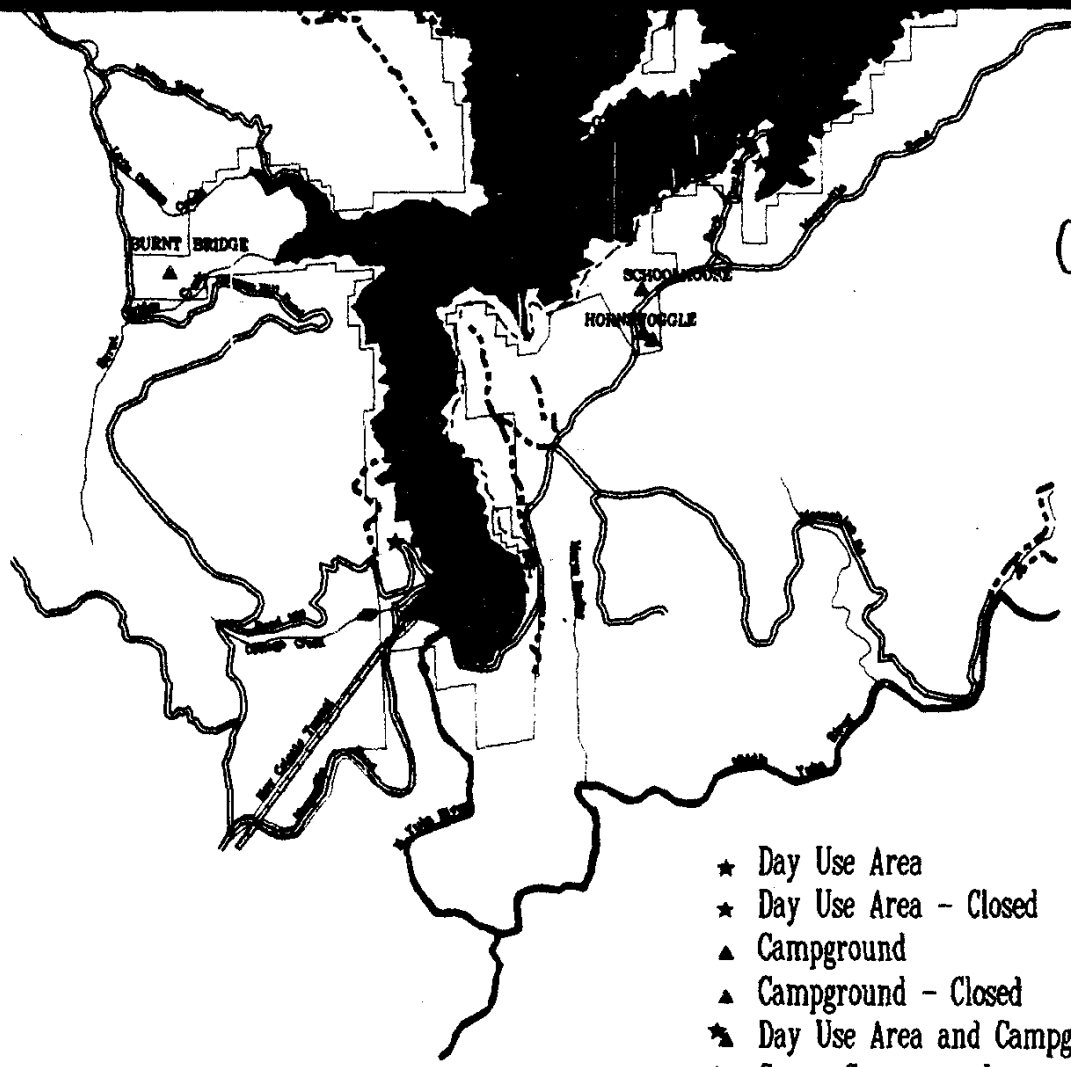


Figure 4.1

CONCENTRATED SHORELINE USE AREAS



- ★ Day Use Area
- ★ Day Use Area - Closed
- ▲ Campground
- ▲ Campground - Closed
- ★▲ Day Use Area and Campground
- ▲▲ Group Campground
- ▲ Boat Access Campground
- ★ Boat Ramp

- Concentrated Shoreline Use Area
- Pond
- Lake
- Concentrated Shoreline Use Area
- Perennial Stream
- River
- Trail
- Unimproved Dirt Road
- Light Duty Road
- State Highway
- Tunnel

Scale 1:60000

Source: Yuba County Water Agency, USGS

The elements most often identified as important to visitors are water quality, safety of boating conditions, and cleanliness. The elements most often identified as satisfactory are natural setting, and water quality. Elements with a high importance frequency and a low satisfaction frequency include safety and boat launch facilities. The low level of satisfaction with safety and boat launch facilities can probably be explained best by the results of the user comments section of the mailback questionnaire (Table B.41). Twenty five percent of all user comments identified unsafe boat operation as a perceived problem. Fourteen percent of all user comments identified parking lot crowding and boat ramp congestion as problems. Other elements that should be of concern are cleanliness, security, and number of boats on the reservoir. The recreation elements with the lowest frequency of importance responses are hiking opportunities and picnic areas.

4.3 User Sense Of Crowdedness

In order to help determine the social carrying capacity of the New Bullards Bar Recreation area, recreationists were asked several questions regarding their perceptions of crowdedness on the reservoir surface and shoreline.

In Table B.36 crowdedness data were sorted by the three most popular activities at New Bullards Bar Reservoir (boat fishing, water skiing, and pleasure boating), and by day type. The data presented in this table were derived from a question on the mailback questionnaire asking recreationists how crowded they felt while pursuing their primary activity. Forty seven percent of boat fishermen responding to this question reported moderate to extreme crowding on weekends, and 60 percent reported this degree of crowding on holidays. The fewest number of fishermen felt crowded on weekdays (28%). For water-skiers the highest reports of crowding occurred on holidays (62%) followed by weekdays (44%), and weekends (39%). Pleasure boaters consistently had the fewest reports of crowding (below 45% for all day types). While these figures indicate that crowding may be a problem on weekends and holidays, they do not indicate specific areas where crowding is occurring.

Tables B.37, B.38, and B.39 describe user sense of crowdedness on the reservoir shoreline and surface. Table B.37 presents the results of a two part interview question measuring user sense of crowdedness on the reservoir surface and

shoreline in the *zone* where the user was contacted. Table B.37 indicates the frequency of moderate and extremely crowded responses was low for both the shoreline (12%) and the water surface (24%). Table B.38 contains data collected through personal interviews regarding sense of crowdedness in the immediate shoreline *area* where the user was contacted. Results of this question indicate that crowding problems on the reservoir shoreline are minimal. When recreationists were asked which zones of the reservoir surface they felt were most crowded (Table B.39), zones D and E received the highest number of moderately and extremely crowded responses followed by zones A, I, and O. However, the frequency of crowdedness responses for all sections of the reservoir was relatively low (below 15 percent). Thus, it appears that crowding problems on the reservoir surface are minimal.

While recreation users indicated that they felt crowded while pursuing their primary activity, the questions regarding sense of crowdedness on the reservoir surface and shoreline failed to indicate where users were feeling crowded. However, a review of user comments (Table B.40) indicates a large number of recreationists at New Bullards Bar Reservoir feel crowded at the boat ramps and day use parking facilities. This observation is further supported by the high occupancy levels consistently recorded at the boat ramps during the recreation season.

4.4 User Conflicts And Comments

Table B.40 was developed from a question on the mailback questionnaire asking if the user experienced any conflicts with other user groups while pursuing his/her primary activity. Visitors who listed water skiing and pleasure boating as their primary activity reported problems with crowding and parking at boat launches, unsafe boat operation on the reservoir, and non-compliance of boats in the no-wake zones.

Visitors whose primary activity was boat fishing most often reported ski boats driving too close, other anglers fishing too close, and non-compliance of boats in the no-wake zones.

Table B.41 summarizes the frequency by main topic of the general comments section of the questionnaire. Topics most frequently commented upon include

unsafe boat operation, water quality concerns, restrooms, management issues and suggestions and boat ramp parking congestion. One probable cause of the high reports of crowdedness in Table B.35 may be the overuse at the boat ramp parking facilities.

Table B.42 is a frequency distribution of individual user comments. The most frequent comments were concerning unpleasant restrooms followed by debris floating on the reservoir and parking areas being too crowded.

5.0 PHYSICAL CARRYING CAPACITY AND FUTURE RECREATION DEMAND

5.1 Carrying Capacity

One of the primary goals of this revised recreation plan is to develop guidelines for future use and development that preserves the "uncrowded" experience at the Project. Crowding and problems of overuse are becoming increasingly common in many outdoor recreation settings, including New Bullards Bar Reservoir. One of the most common tools used to help understand and control this problem is the concept of carrying capacity. There are several different types of carrying capacities, and the term is widely used in social and environmental sciences. For the purpose of this study, social and physical carrying capacities will be used. Social carrying capacity can be defined as the level of use beyond which social impacts exceed acceptable levels specified by evaluative standards (Shelby and Heberlein, 1986). The physical capacity, or facility capacity is defined by the design capacity of the recreation facilities (Shelby and Heberlein, 1986) or by safety standards for certain activities.

Licensee calculated both the physical capacity and future recreation demand of the Project according to the number of visitors, boats, or occupied parking units *at any one time*. The physical capacity was obtained by multiplying the number of units at each individual recreation site by the maximum number of persons each unit is designed to accommodate. For example, Schoolhouse Campground has 67 camping units each designed for six visitors, giving that site a total physical capacity of 402 Persons At One Time (PAOTs). In boat launching areas, the physical capacity is determined by the number of parking units. Cottage Creek Boat Ramp has 112 parking units, each accommodating either a single car or a boat trailer. Several of the recreation sites at New Bullards Bar currently have use levels that reach or exceed the designed physical capacity.

5.2 Future Recreation Demand

In order to facilitate the best management practices and development alternatives for any recreation facility, a commonly used tool in planning is the estimate of future recreation demand at that facility. While future demand is a theoretical projection,

there are several data sources that can be used together to create a reasonable estimate of future demand. Licensee used information obtained from 1991 California Department of Finance documents and the 1991 Recreation User Survey conducted by Licensee in cooperation with the TNF to estimate future recreation demand for the Project.

The first step in calculating future demand estimates was an analysis of the zip codes of users responding to the 1991 Mailback Questionnaire to determine their home regions in California. Approximately one third of the users came from the Project region of Yuba, Sutter, Sierra, and Nevada counties, and one third came from the Sacramento region. Additionally, 28 percent were from the San Francisco Bay region, and the remaining 6 percent were from other regions (Table 5.1).

TABLE 5.1
ORIGIN OF USER POPULATION BY GEOGRAPHIC REGION

Geographic Region	
Project Region*	39%
Sacramento Region	32%
San Francisco Region	23%
Outlying Areas	6%
TOTAL	100%

* Project Region includes Yuba, Sutter, Nevada and Sierra counties

Licensee calculated the growth rates for each of these four regions using California Department of Finance population Projections for the year 2005 (California Department of Finance 1991). These rates were then applied back to the respective number of visitors coming from each geographic region to determine the approximate total number of users for the year 2005 at the Project (Table 5.2). This overall growth rate (35%) was then applied to each of the individual Project facilities to obtain site-specific demand growth, projected for 2005. Future demand estimates for BAOT on the reservoir were made only for small watercraft. Because of the many different factors affecting houseboat demand and the complex relationships between them, no estimates of houseboat demand were made. Small watercraft demand figures were calculated by multiplying the estimated reservoir

use in BAOT by the estimated growth projection of 35 percent for the Project (Table B.7, Table 5.3).

TABLE 5.2
REGIONAL GROWTH RATES
and FUTURE DEMAND PROJECTIONS

Geographic Region	Estimated Growth Rate	1991 Use PAOT	Projected 2005 PAOT
Project Region	39%	405	563
Sacramento Region	45%	332	481
San Francisco Region	17%	239	280
Outlying Areas	30%*	62	81
	Avg. 35%	TOTAL 1038	1405

*State of California estimated growth projection

TABLE 5.3
SMALL WATERCRAFT USE LEVELS
and ESTIMATED FUTURE DEMAND
(BAOT)

Boat Type and Origin	Existing Use		Future Demand	
	Primary Day	Seasonal	Primary Day	Seasonal
Launched from Cottage Creek**	94	51	127	69
Launched from Dark Day**	77	50	104	68
TOTAL	**171**	**137**	**311**	**217**

**Information based on counts of Trailers At One Time in boat launch parking areas.

5.3 Boating and Reservoir Surface

As stated in Section 4.1, the primary activities at New Bullards Bar Reservoir are water-based. Consequently, a critical element of the overall carrying capacity for the Project is the number of boats on the reservoir at one time. Physical capacity for boats on a body of water is difficult to determine because safety standards for boating activities vary considerably. In addition, activities are constantly changing and the ratio of active and inactive boats is inconsistent. Due to these difficulties, Licensee did not calculate a physical carrying capacity for boats on the lake. A

discussion of social carrying capacity, which was used to determine the overall capacity for boats on the reservoir, is presented in Section 6.0.

Licensee feels that the existing average use level of 171 Boats At One Time on the lake for primary days (Table 5.3) is well below the social carrying capacity. However, because the carrying capacity in BAOT has not yet been determined, an estimate of the ability of the Project to accomodate boating demand for the year 2005 cannot currently be made. Once the social carrying capacity in BAOT for the Project is determined, it should be compared to the estimated average seasonal and primary day demand figures for the year 2005 to give an indication of the ability of the Project to meet boating demand.

5.4 Boat Ramps

The physical design capacity of Dark Day and Cottage Creek boat ramps is 276 parking units. The 1991 use levels reached an average of 432 parking units occupied on primary days, or 50 percent more than the design capacity. While the design capacity of Cottage Creek (112 units) is smaller than that of Dark Day (164 units), the number of vehicles and boats using Cottage Creek is much greater than the use at Dark Day. The future demand for parking units reflects these trends as well. The total parking demand is expected to reach 544 units on average primary days for the year 2005; 302 at Cottage Creek, and 242 at Dark Day. The current parking facilities do not accommodate existing use, and do not appear to be sufficient for meeting future demand estimates (Table 5.4).

TABLE 5.4
BOAT RAMP CAPACITY and USE LEVELS
(Parking Units)

	Facility Capacity	Existing Use		Future Demand	
		Primary Day	Seasonal	Primary Day	Seasonal
Cottage Creek Boat Ramp	112	245	131	302	177
Dark Day Boat Ramp	164	187	120	242	162
TOTAL	276	432	251	544	339

5.5 Picnic and Day Use Areas

Most day use at the Project occurs along the shoreline outside of the developed day use areas. Therefore, the use levels at developed Project picnic and day use areas are well below capacity. The Dark Day Picnic Area has a design capacity of 84 PAOT and the use in 1991 was an average of 28 PAOT on primary days. The projected future demand is 38 PAOT on primary days, or 45 percent of capacity. Sunset Vista Point, the second day use site, has a physical capacity of 10 persons, while the average use is currently one PAOT. The future demand at this facility is expected to rise only slightly and the facility should easily meet demand up to the year 2005. The trends in recreation at the time of the original Project development showed a greater demand for picnicking than is seen now or is anticipated in the near future at the Project, and the existing facilities should easily meet demand (Table 5.5).

5.6 Campgrounds

The camping facilities at New Bullards Bar appear to be just above capacity on average primary days. The physical capacity for boat access camping is 403 PAOT (Table 5.5). This number was obtained using a weighted average of 63 permits available on primary days (60 on weekends, 80 on holidays). The average use on primary days is currently 461 Persons At One Time, and the future demand estimate for shoreline and boat-access camping is 622 PAOT. The future demand figures suggest that with present facilities, over one third of future demand for camping at the Project will be unmet. However, occupancy data for the boat-access campgrounds may be higher than actual use levels due to double counting of occupancy in data recording methods.

TABLE 5.5
PROJECT FACILITY CAPACITY, EXISTING USE, and FUTURE DEMAND PROJECTIONS
(PAOT)

Recreation Element	Facility Capacity	Existing Use		Future Demand	
		Primary Day	Seasonal	Primary Day	Seasonal
Boat Ramps					
Cottage Creek	198	441	232	595	313
Dark Day	290	319	203	431	274
TOTAL	488	760	435	1026	587
Picnic and Day Use					
Dark Day Picnic Area	84	28	14	38	19
Sunset Vista Point	10	1	1	1	1
TOTAL	94	29	15	39	20
Campgrounds					
Boat-Access					
Frenchy Point	48	48	24	65	32
Madrone Cove	60	78	49	105	66
Garden Point	120	140	99	189	134
Shoreline Camping	175	195	112	263	151
TOTAL	403	461	284	622	383
Inland					
Schoolhouse	402	413	256	558	346
Dark Day	96	86	35	116	47
Hornswoggle	150	147	71	198	96
TOTAL	648	646	356	872	489
Camping Total	1051	1107	640	1494	872
North Yuba River Development					
PROJECT TOTAL	**1633**	**1896**	**1090**	**2559**	**1479**

The inland campgrounds (Schoolhouse, Dark Day, and Hornswoggle) present a similar situation. The total physical capacity for these three sites is 648 PAOT, and the existing use levels average 646 persons on primary days, essentially at capacity. The future recreation demand in these areas is expected to reach 872 PAOT in 2005.

Although the figures for the shoreline and boat-access camping are slightly higher than the true use levels, overall camping facilities are currently at capacity on weekends and holidays. Total camping capacity is 1,051 PAOT, and the existing use is 1,107 PAOT. However, seasonal averages suggest the facilities are less crowded. The existing average seasonal use for all the campsites combined, including dispersed shoreline use, is 640 PAOT, and the future demand based on a seasonal average is 877 PAOT. These numbers reflect approximately 60 percent and 83 percent of capacity, respectively. While these use levels are high, the seasonal averages do not reflect critical overuse like the primary day figures.

5.7 Total Project Physical Capacity and Future Demand

In addition to analyzing use levels and future demand estimates for specific recreation sites at the Project, it is useful to know the total Project capacities and to have an estimate of the recreation use levels and demands for the entire Project area.

The total Project capacity in Persons At One Time (PAOT) is estimated by converting the measurement of use at the boat launch areas from parking units into PAOT, and adding the PAOT capacities of the remaining camping and day use facilities to this number. The Project's physical capacity is 1,633 PAOT (Table 5.5).

Use levels for the Project as a whole can be estimated in the same manner, by adding the use figures (in PAOT) for each recreation element on the Project. The number of boats on the reservoir is not included in facility capacity or use level figures, due to the fact that they are accounted for in boat ramp use. The existing use levels are 1,896 PAOT for primary days and 1,090 PAOT for the seasonal average. The primary day figures reflect use 14 percent beyond capacity, while seasonally the facilities are at 66 percent of total capacity. The future outlook for

recreation demand shows a demand of 2,559 PAOT on primary days, and 1,479 PAOT average estimated for the recreation season in 2005.

Each of the use estimates for the Project as a whole may be slightly higher than actual use levels, due to a possible overlap of counting visitors in both campgrounds and boat launch areas.

5.8 Conclusions

On a Project-wide basis and at the majority of developed sites, current recreation demand on primary days is higher than the physical capacity. This fact is most evident in looking at the boat ramps which are 50 percent above capacity, and at camping facilities which are 30 percent above capacity for boat access camping and essentially full at inland campgrounds.

When looking at the seasonal average use levels throughout the Project, however, use ranges from 16 percent of capacity in day use areas, to 82 percent in the largest boat access campgrounds. These occupancy rates suggest a more moderate pattern of use over the duration of the 1991 season than on primary days.

Licensee estimates that the increase in demand on primary days cannot be met at Project facilities without sacrificing the quality of the visitor recreation experience and the natural environment. Through a cooperative effort between Licensee and USFS, management guidelines to be followed should meet seasonal future demand and a portion of primary day demand, while preserving the quality of recreation experience and natural resource integrity at the Project. Peak primary day demand will not be met.

6.0 CARRYING CAPACITY AND BALANCE OF USES

6.1 Social Carrying Capacity

As stated in Section 5.1 social carrying capacity is defined as the level of use beyond which social impacts exceed acceptable levels specified by evaluative standards (Shelby and Heberlein, 1986). A variety of methods can be used to determine social carrying capacity. This plan uses two methods developed by the USFS, the Recreation Opportunity Spectrum (ROS), and Limits of Acceptable Change (LAC). Each of these methods and their use in recreation planning and management are discussed below.

Social carrying capacity is often the limiting factor when determining an optimum number of users for a recreation area (Shelby and Heberlein, 1986). Two important elements that can be used to set social carrying capacity are 1) user density (or use level) and 2) the impact of user density on satisfaction with the recreation experience (Freedman, 1975, in Gifford, 1987). By analyzing the density or use level with respect to impacts, an effective social carrying capacity can be set. This approach requires contact with users of the recreation area to reveal at what level and to what degree impacts are being sensed. Two of the most common impacts to be measured are general satisfaction with the recreation visit, and the degree of crowding perceived by the visitor at a certain use level. Scales on which these evaluations are measured, such as the five point Likert Scale (Figure 6.1) used in this study, are the "evaluative standards" by which an acceptable level of impact can be estimated (Babbie, 1986; Shelby and Heberlein, 1986).

FIGURE 6.1
LIKERT SCALE FOR
CROWDEDNESS

1	2	3	4	5	6	7	8	9
Not at all Crowded		Slightly Crowded			Moderately Crowded		Extremely Crowded	

Recreation use at the Project is primarily boating and other water based activities (Table B.28). Subsequently, social carrying capacity is expressed in this plan as the number of occupied Boats on the reservoir At One Time (BAOT).

When asked during a personal interview whether the reservoir zone they were presently in felt crowded, over 60 percent of the visitors interviewed during the 1991 season reported that they did not feel at all crowded on the surface of the water or on the shoreline in their zone (Table B.37). This suggests that the reservoir has not yet reached its social carrying capacity at the existing use level of 207 BAOT for primary days (Table B.7). Licensee and the USFS feel that establishing a social carrying capacity limit and a balance of uses through utilization of ROS guidelines and LAC evaluation are the most important issues in preserving the high level of user satisfaction (Table B.35) with the recreation experience at the Project.

6.2 The Recreation Opportunity Spectrum

"The basic assumption underlying ROS is that quality in outdoor recreation is best assured through provision of a diverse set of opportunities (USFS, 1986)." One of the objectives of this study is to identify the range of recreation experiences that will be provided at New Bullards Bar Reservoir and to recommend management practices that will preserve these experiences. ROS provides methodology and guidelines for doing exactly that; it furnishes a framework for classifying types of recreation experiences and managing the natural and social settings of an area to ensure a variety of recreation settings and experiences are offered. Managing the social settings should include setting a threshold use level or a social carrying capacity, to ensure that the satisfaction of the users is considered in Project planning.

While ROS was originally developed for land-based recreation, recently it has been adapted to flatwater recreation situations. For the purposes of this study, both land and flatwater applications of ROS were used.

6.2.1 ROS For Land-Based Recreation

ROS for land-based recreation has been used in this study as a general guideline in determining the appropriate level of inland facility development for the natural conditions and desired recreation experience.

The USFS has designated ROS classifications for the land area surrounding New Bullards Bar Reservoir. The TNF and PNF Land and Resource Management Plans (USFS 1990, 1988) classify the Project study area as Rural at developed sites such as Schoolhouse Campground and Cottage Creek Boat Ramp, and Roaded Natural in all other areas. USFS management objectives for the Rural and Roaded Natural classifications are presented below (USFS 1986).

> **Roaded Natural:** Provide a naturally appearing area where there is moderate evidence of human activity. Interaction and contact with other users is of moderate importance. Modifications are evident but not visually dominant to observers in the area. Although hiking opportunities are provided, emphasis is placed on recreational opportunities associated with developed road systems, as well as compatible fish and wildlife management which supports hunting and fishing activities. Timber harvesting is modified in recognition of recreation values and soil and water improvements.
>
> **Rural:** Provide developed recreation facilities and other high-density dispersed areas characterized by a substantially modified natural environment. Evidence of, and interaction with other users are high. Convenience of user facilities is important. This classification is directed toward management of recreation opportunities in campgrounds, picnic grounds, day-use areas, marinas, etc., while maintaining visual and water quality. Habitat management of the fishery resources will be to enhance angling opportunities.

All land-based recreation activities in the Project study area are compatible with these two recreation management objectives.

6.2.2 ROS For Water-Based Recreation

The existing classifications for land-based recreation provide little guidance for open, flatwater recreation. In order to best plan for water-based recreation at

the Project, a version of ROS modified for flatwater recreation was used for this study (Frye 1986). The management objectives for the five flatwater ROS classifications are described in Table 6.1. Considering the range of settings and activities that exists at New Bullards Bar Reservoir, the three classes of Urban-Natural, Rural-Natural, and Semi-Primitive were determined to be most appropriate.

User density is a key element that affects visitor experience and controlling it is useful in managing the social setting of an area. Consequently, it is one of the most important management tools used in ROS. In open, flatwater recreation settings such as New Bullards Bar Reservoir, the key to "user density" is boat density. The number of boats in an area and the types of activities participated in have a direct impact on the type and quality of the recreation experience. The ROS guidelines do not set specific values for use levels, because these numbers will vary according to site-specific characteristics for each Project. The ROS method used to establish a social carrying capacity for the Project is discussed below.

Each section of the reservoir was evaluated to determine its appropriate ROS classification. A map showing the ROS classes for the lake is provided (Figure 6.2).

Less than five percent of the surface area of the reservoir is classified as Urban-Natural. This section is at the southern end of the reservoir and includes the Emerald Cove Marina, Cottage Creek Boat Launch, and New Bullards Bar Dam. Human activity and modifications of the natural environment are visually dominant. A large number of boats are stored in this section, and those that are moving travel at low speeds. There is a five mile per hour speed limit in this section and it is managed for high density uses.

About 50 percent of the reservoir surface is classified as Rural-Natural. This contiguous section is the main traffic corridor connecting the two boat ramps to the upper arm of the reservoir. It is characterized by a natural appearing

TABLE 6.1
THE FIVE FLATWATER ROS CLASSES

SPECTRUM OF OPPORTUNITIES	PRIMITIVE	SEMIPRIMITIVE	RURAL/NATURAL	URBAN/NATURAL	URBAN
					
SETTINGS	· NATURAL APPEARING LANDSCAPE · ENCOUNTERS WITH OTHER WATERCRAFT RARE · NO EVIDENCE OF SHORELINE FACILITIES · NO EVIDENCE OF HUMAN OCCUPATION ON SHORELINE · NO MOTORIZED ACCESS TO THE WATER FROM SHORELINE	· PREDOMINATELY NATURAL APPEARING LANDSCAPE · OCCASIONAL ENCOUNTERS WITH OTHER WATERCRAFT · EVIDENCE OF UNOBTRUSIVE SHORELINE SUPPORT FACILITIES FOR BOATING & CAMPING - NO SERVICE FACILITIES · SHORELINE MAY SHOW EVIDENCE OF HUMAN OCCUPATION · NO MOTORIZED ACCESS TO THE WATER FROM SHORELINE	· PREDOMINATELY NATURAL APPEARING LANDSCAPE WITH SMALL SCALE MODIFICATIONS · SHORELINE SERVICE FACILITIES FOR MOTORIZED BOATING · FREQUENT ENCOUNTERS WITH OTHER WATERCRAFT · EVIDENCE OF HUMAN OCCUPATION ON SHORELINE · SHORELINE ACCESSIBLE BY MOTORIZED LAND VEHICLES	· PREDOMINATELY MODIFIED LANDSCAPE WITH FACILITIES TO PROVIDE MAJOR VISITOR SERVICES IN A SUBSTANTIALLY URBANIZED ENVIRONMENT WITH A NATURAL APPEARING BACKDROP · CONSTANT ENCOUNTERS WITH OTHER WATERCRAFT · SHORELINE SHOWS THE "WEAR" OF HUMAN OCCUPATION · SHORELINE ACCESSIBLE BY MOTORIZED LAND VEHICLES	· COMPLETELY MODIFIED LANDSCAPE WITH FACILITIES TO PROVIDE MAJOR VISITOR SERVICES FOR HIGHLY INTENSIFIED MOTORIZED USE IN A TOTALLY URBANIZED ENVIRONMENT · CONSTANT ENCOUNTERS WITH OTHER WATERCRAFT · SHORELINE IS HEAVILY IMPACTED BY HUMAN OCCUPATION · SHORELINE ACCESSIBLE BY MOTORIZED LAND VEHICLES AND MAY HAVE MASS TRANSIT ACCESSIBILITY
EXPERIENCE	· ISOLATION FROM SIGHTS & SOUNDS OF MAN · FEELING OF CLOSENESS WITH NATURE · OPPORTUNITY TO EXPERIENCE SOLITUDE, TRANQUILITY, QUIET · HIGH DEGREE OF CHALLENGE, SELF RELIANCE, RISK · KNOWLEDGE & USE OF OUTDOOR SURVIVAL & WILDERNESS SKILLS · INFREQUENT ENCOUNTERS WITH OTHER HUMANS OR WATERCRAFT	· PREDOMINATELY ISOLATED FROM SIGHTS & SOUNDS OF MAN · OPPORTUNITY TO EXPERIENCE SOLITUDE, TRANQUILITY, QUIET MAY BE OBTAINED · INTERACTION WITH NATURE PREDOMINATES · KNOWLEDGE & USE OF OUTDOOR SURVIVAL & WILDERNESS SKILLS · OCCASIONAL ENCOUNTERS WITH OTHER HUMANS OR WATERCRAFT	· LIMITED OPPORTUNITY TO EXPERIENCE SOLITUDE, TRANQUILITY, QUIET · KNOWLEDGE & USE OF OUTDOOR SURVIVAL & WILDERNESS SKILLS IS NOT ESSENTIAL · FREQUENT ENCOUNTERS WITH OTHER HUMANS OR WATERCRAFT	· SIGHTS & SOUNDS OF MAN ARE DOMINANT · LIMITED OPPORTUNITY TO EXPERIENCE SOLITUDE, TRANQUILITY, QUIET · NO KNOWLEDGE OR USE OF OUTDOOR SURVIVAL & WILDERNESS SKILLS NECESSARY · NEAR CONSTANT ENCOUNTERS WITH OTHER HUMANS & WATERCRAFT	· SIGHTS & SOUNDS OF MAN ARE DOMINANT · OPPORTUNITY TO EXPERIENCE SOLITUDE, TRANQUILITY, QUIET, IS NONEXISTENT · NO KNOWLEDGE OR USE OF OUTDOOR SURVIVAL & WILDERNESS SKILLS NECESSARY · CONSTANT ENCOUNTERS WITH OTHER HUMANS & WATERCRAFT
ACTIVITIES	NONMOTORIZED · PRIMITIVE CAMPING · SMALL WATERCRAFT · SAILBOARDING · SAILING · SWIMMING · SNORKELING/SCUBA DIVING · FISHING · NATURE OBSERVATION · HUNTING · SHORELINE HIKING	NONMOTORIZED TO MOTORIZED · SEMIPRIMITIVE CAMPING · SMALL WATERCRAFT · SAILBOARDING · SAILING · SWIMMING · SNORKELING/SCUBA DIVING · FISHING · NATURE OBSERVATION · HUNTING · SHORELINE HIKING	NONMOTORIZED TO MOTORIZED · SEMIPRIMITIVE CAMPING FROM BOATS & VEHICLES · ALL TYPES OF WATERCRAFT INCLUDING TOUR BOATS & FERRY BOATS · SAILBOARDING/SAILING · SWIMMING · SNORKELING/SCUBA DIVING · FISHING · NATURE OBSERVATION · SHORELINE HIKING · WATER-SKIING/JET-SKIING	NONMOTORIZED TO MOTORIZED · DESIGNATED CAMPING · ALL TYPES OF WATERCRAFT INCLUDING TOUR BOATS & FERRY BOATS · SAILBOARDING/SAILING · DESIGNATED SWIM BEACH · FISHING · SHORELINE HIKING · WATER-SKIING/JET-SKIING	NONMOTORIZED TO MOTORIZED · DESIGNATED CAMPING · ALL TYPES OF WATERCRAFT INCLUDING TOUR BOATS & FERRY BOATS · SAILBOARDING/SAILING · DESIGNATED SWIM BEACH · FISHING · SHORELINE HIKING · WATER-SKIING/JET-SKIING

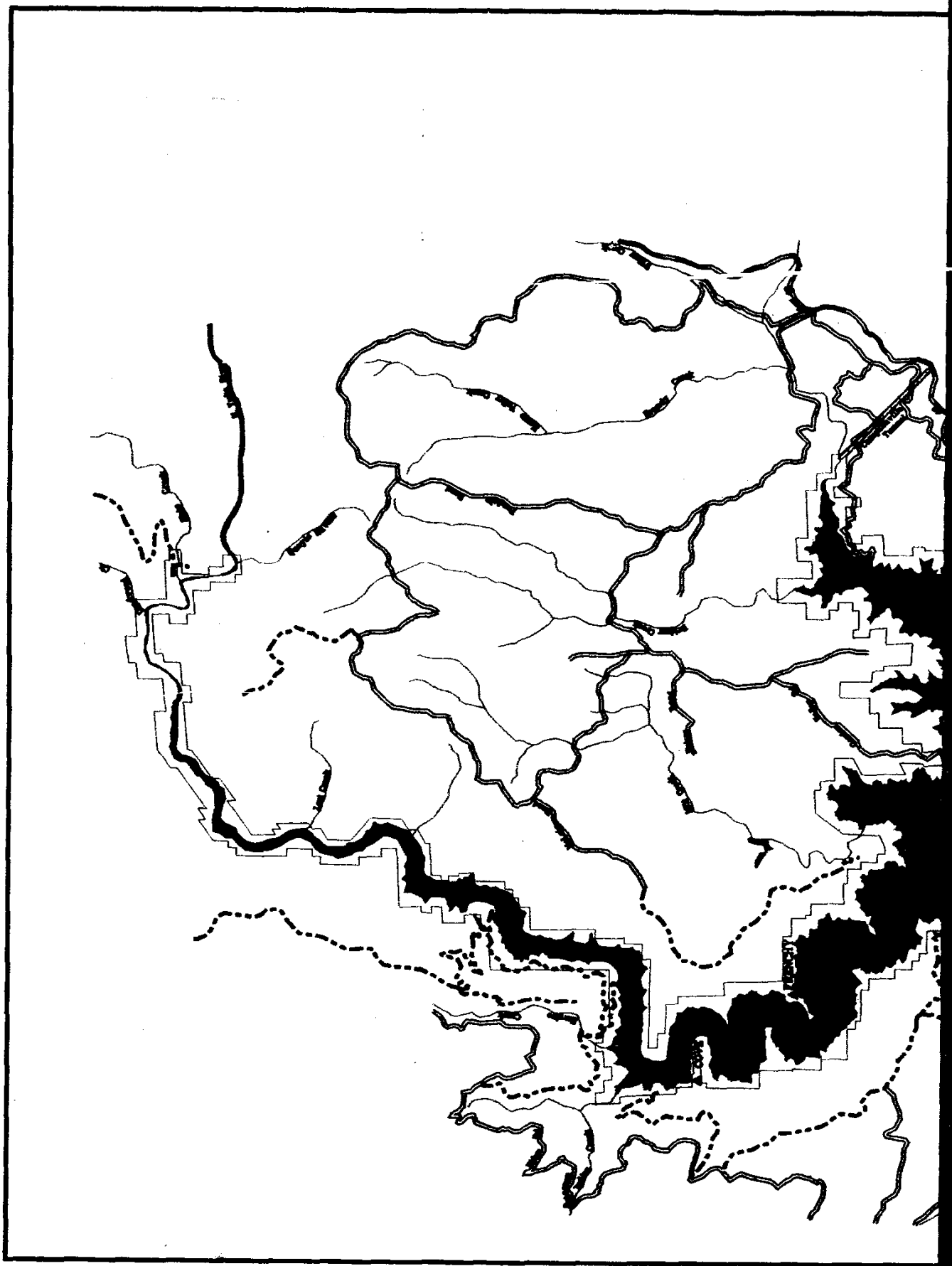
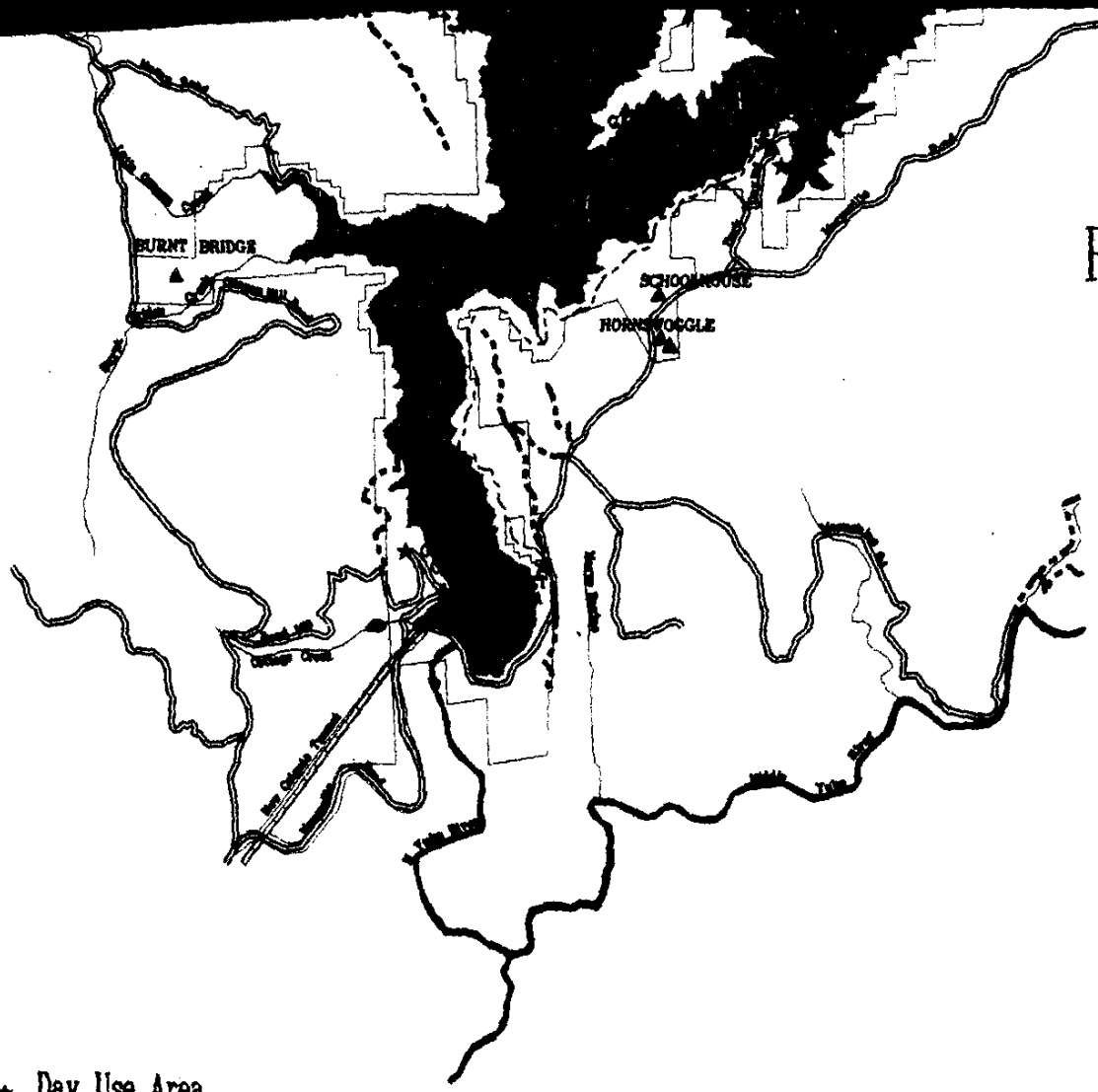


Figure 62

RECREATION OPPORTUNITY SPECTRUM CLASSES



ROS Acreage

Class	Acreage
UN	180
RN	2155
SPH	1516
SPL	225

- ★ Day Use Area
- ★ Day Use Area - Closed
- ▲ Campground
- ▲ Campground - Closed
- ★▲ Day Use Area and Campground
- ▲ Group Campground
- ▲ Boat Access Campground
- ★ Boat Ramp

- Perennial Stream
- River
- Trail
- Unimproved Dirt Road
- Light Duty Road
- State Highway
- Tunnel

- Urban Natural ROS class (UN)
- Rural Natural ROS class (RN)
- Semi Primitive High Speed ROS class (SPH)
- Semi Primitive Low Speed ROS class (SPL)
- Pond

Scale 1:60000

Source: Yuba County Water Agency, USGS

landscape with moderate modifications. The section includes Garden Point, the largest boat access campground, Dark Day Boat Ramp, and a majority of the usable reservoir shoreline. This section is suitable for most flatwater recreation uses.

The remaining 45 percent of the reservoir is classified as Semi-Primitive. The section includes the Upper North Yuba and Willow Creek arms of the reservoir, as well as several smaller coves and has a predominantly natural appearance with only minor modifications. It contains Madrone Cove and Frenchy Point Boat Access campgrounds and several large usable shoreline areas. The meandering nature of the Upper North Yuba Channel and the convoluted shoreline provides a more primitive, remote recreation opportunity. A small portion of this section is suitable only for low speed uses due to narrow channels.

Once the ROS classes for the lake were established, Licensee identified the optimal boat densities or coefficients for each ROS class. The following factors were taken into account: the overall size of New Bullards Bar reservoir, the size of each ROS class section, and the use levels and desired experiences within the section. Boat density standards for safety were also considered. The U.S. Coast Guard Chief of Boating Education and Safety suggests that an area of about 13.7 acres per boat is needed for water-skiing (Urban Research and Development Corp. 1988). A study conducted by the Bureau of Outdoor Recreation in 1977 recommended a range of 9 to 18 acres of surface per boat as a safety standard for high-speed boating on open water (National Park Service 1987). Licensee determined that a high density (1.25 acres/boat) would be appropriate in the Urban-Natural section of the reservoir where many boats are stored or traveling at low speeds. In the Rural-Natural section, Licensee determined a density of 12 acres per boat to be appropriate due to the large open water surface and the existing use. In the more remote semi-primitive sections where a more primitive experience is desired, Licensee selected a boat density of 18 acres per boat.

After the social carrying capacity coefficients for the ROS classes were determined, Licensee calculated the carrying capacity in the number of boats for each section by dividing the acreage of each ROS class section by the social

carrying capacity coefficient. The boat capacity figures for each section were then added together to give the total carrying capacity for the Project. The results are presented below in Table 6.2.

TABLE 6.2
SOCIAL CARRYING CAPACITY
(BOATS AT ONE TIME)

ROS Class	Section Size (Acres*)	Capacity Coefficient (Acres/Boat)	Capacity (BAOT)
Urban Natural	180	1.25	144
Rural Natural	2155	12.00	180
Semi Primitive	1740	18.00	96
TOTAL	4075	9.65	420

* Acres for each ROS class are based on the USGS 7.5 minute quadrangle water surface elevation of 1,902 feet National Geodetic Vertical Datum Plane.

6.3 Balance of Uses

Another goal of this recreation plan is to provide a balance of recreation uses within the social carrying capacity of 420 BAOT. The term balance has a variety of meanings and applications. For the purposes of this plan, balance is defined as follows: when recreation use for any identified use type is at maximum capacity, there is opportunity for all appropriate uses; one use does not dominate others; and there is an acceptable level of use at existing facilities and resource areas. Four use types have been identified with current use: inland camping, boat access camping, houseboating, and day use. These uses were identified because they all have long term effects and indicate Project facility needs.

Inland camping is defined as overnight use of developed Project campgrounds accessible by auto. Inland campers generally use the boat ramps, parking facilities, reservoir surface and shoreline space in a manner similar to day users and return to their campsites in the evening.

Boat access camping (BAC) is defined as overnight use of developed and shoreline dispersed sites accessible by boat. Boat access campers tend to require more shoreline space than day users due to equipment needs.

Houseboat use is defined as occupancy of a self-contained craft sanctioned by Licensee, and permanently moored at the Project. Houseboat users generally have at least one associated small water craft and generally use the shoreline.

Day use includes a variety of activities such as water-skiing, fishing, and boating that utilize the water surface and shoreline for a period of 12 hours or less. At the conclusion of their recreation visit, day-users leave the Project area.

Recreation use balance is composed of several interrelated factors including: total use levels, use types, activity types, and changes in activity demand over time. This balance will be measured and/or defined through the LAC process (this will be discussed in more detail in the following section). Generally, monitoring/evaluation will occur annually during the recreation season (high use season is April through October) and will identify trends in total recreation use at the Project and the ways in which these trends may affect facility and natural resource conditions. It will also focus on trends by user type and activity, with the goal being to ensure that one use has not displaced or overshadowed another. Once trends have been defined, they will be evaluated as to their effectiveness in meeting the mission and goals of the plan and appropriate changes in management practices will be made.

6.4 Limits of Acceptable Change

To further refine the social carrying capacity as developed through ROS, and to develop a balance of uses, a process developed by the USFS referred to as Limits of Acceptable Change was used in this plan. The LAC process differs from ROS in that it identifies and maintains desired conditions of a recreation experience rather than establishing numerical limits. It is a planning and monitoring system that focuses on actual changes that occur in the resource or social setting as a means of guiding or directing management actions in an area. Many recreation plans identify recreation or resource carrying capacities by assigning a number which correlates to the amount of use an area can potentially tolerate. These numbers, however, often

fail to present a clear relationship between the amount of use and the quality of the recreation experience or the extent of environmental impact. The LAC system as used in this plan directs attention to identifying the desired resource and social conditions that best suit the area and designing a management strategy to achieve and/or maintain them. Using these tools with a carrying capacity number provides both structure and flexibility for management.

The LAC process described by Stankey, et. al (1985) for wilderness planning was adapted to flatwater recreation planning for better application to this Project. Provided below is a list of the steps in the LAC planning process and a brief explanation of the actions taken for the Project:

1) Identify Issues and Concerns - Identify unique values, special opportunities and problems requiring special attention. The mission and goal statement for the Project was developed in this step.

2) Define and Describe Opportunity Classes - Opportunity classes were developed in the ROS process (page 6-5), and are described by a set of desired conditions. Managing balance of uses is the most applicable and effective way of managing opportunity classes in a flatwater recreation setting. Licensee and USFS developed alternatives that addressed a range of balances and evaluated these alternatives against the mission and goals.

3) Determine Indicators - A set of measurable biological, physical, and social variables that guide the inventory process. The inventory process is a means of identifying the baseline conditions of each opportunity class. A preliminary set of indicators have been developed but will be further refined prior to implementation.

4) Inventory Biological, Physical, and Social Conditions - Conduct surveys and inventory existing conditions and document results. Social surveys have been conducted and resulting data has been analyzed and applied to develop balance of use alternatives. The physical survey has been initiated but not completed. Biological data will be collected when the monitoring program commences.

5) Develop Standards - Define limits of acceptable change by quantifying acceptable conditions in each opportunity class. This step will be accomplished in an annual operating plan.

6) Balance Desired Conditions - Compare desired conditions with existing conditions and agency capabilities. This is an ongoing process that was utilized in the balance of uses and will continue to be utilized as user data is collected and analyzed.

7) Plan Implementation - Includes identifying management actions, evaluating actions and implementing and monitoring selected actions. Although the LAC process has been initiated by the USFS and Licensee, the process will be further developed and implemented through the annual operating plan that currently exists between the two agencies.

LAC is an ongoing process that is continually used to collect data and evaluate the data against desired conditions. This Revised Exhibit R provides initial guidance for developing biological, physical, and social carrying capacities and a balance of uses that will achieve these conditions. However, as more data is available, it may be necessary to reevaluate the effectiveness and modify the identified capacities, balances, and management actions.

The social carrying capacity discussed in Section 6.2 does not allocate or identify appropriate levels for each use type. However, a balance of uses approach provides a means to show the correlation between use types and a quality recreation experience. When considering a balance of uses, it is important to note that all of the water-based uses rely on the shoreline for part of their total recreation experience. The ROS process identified a theoretical maximum social carrying capacity for the water surface. A logical step would be to develop a theoretical shoreline social carrying capacity and compare it to the water-based capacity figure and user satisfaction data for a reasonable reservoir social carrying capacity. However, the 1991 user survey resulted in inconclusive data on the shoreline capacity. Since this information is not currently available, it will be collected and analyzed through the LAC process to develop a shoreline capacity.

6.5 Recommended Balance of Uses

The recommended management action (best balance of uses) is shown below in comparison with the 1991 and 1992 maximum use days and the maximum carrying capacity developed through the ROS process. Several mixes of uses were generated and rated against criteria which were derived from the mission and goals statement. The recommended balance of uses is a result of this analysis and negotiations with the USFS. Table 6.3 illustrates the past use trends, and offers ROS and balance of use options. **It is imperative to recognize that as a condition of the recommended action, the LAC process be continued throughout the life of the plan.** The operating plan between the USFS and Licensee will address the LAC monitoring needs and the collection and evaluation of data to ensure the plan is dynamic in meeting the desired conditions and goals for recreation use at the Project.

The recommended action provides management with an interim approach until sufficient data can be developed to verify estimated carrying capacity, use levels and types, and balance limits.

The boats associated with inland camping capacity shown in Table 6.3 were derived from the total number of developed inland campground units at the Project. The 1991 recreation user survey data has identified that each camping unit has one small water craft associated with it.

Houseboat and small water craft figures shown in Table 6.3 were based on the holiday use rate for houseboats (77%). Recreation user survey data collected in 1991 indicated that the use rate for houseboats on holidays was 77 percent of those moored. The data also indicated that each houseboat used had one associated small water craft. Eighty houseboats shown under the ROS is the maximum number allowed under the existing contract between Licensee and Concessionaire and represents 100 percent occupancy.

Table 6.3

Historical Holiday Use, ROS Maximum Capacity, and Recommended Balance of Uses (BAOT)

	Maximum Holiday '91*	Maximum Holiday '92**	ROS Maximum Capacity	Recommended Balance Of Uses
Houseboats	27	35	80	60
Associated Small Watercraft	27	35	80	60
Inland Camping	111	111	111	111
Boat Access Camping	80	120	74	74
Day Use	110	107	75	95
TOTAL	**354**	**408**	**420**	**400**

* Figures for Maximum Holiday 1991 are based upon observation data collected by Yuba County Water Agency and TNF 1991.

** Figures for Maximum Holiday 1992 are based upon observation data collected by TNF 1992.

The BAC figures are based on the actual number of permits issued during 1991 and 1992. Figures for recommended balance and maximum ROS capacity are recommendations based on historical use, estimated capacity, and balance of uses. The 1991 user survey data identified that each BAC has one small water craft associated with it.

No clear data for the amount of day use exists. Day use figures are based on the remaining use available after inland, houseboat, and BAC are deducted from the Total BAOT.

The total number of boats for 1991 is based on counts of actual trailers at one time and the total number of houseboats moored at the Project for the 1991 season. The total number of boats for 1992 is the product of the actual number of vehicles at one time, and the percent of vehicles with trailers (66%) for the 1992 season. The maximum watersurface carrying capacity of 420 BAOT was developed in Section 6.2.2.

The recommended balance of uses as shown in Table 6.3 is offered as interim management until data collected in the LAC process are analyzed and indicate that changes in carrying capacities or other management are needed. This is a conservative approach that acknowledges the need to verify the estimated carrying capacities identified in this plan. Benefits of this approach are provided below:

1) The recommended balance of uses is a mid-range option that protects against over-allocation of the resource;

2) It allows for expanded economic return to Licensee and Concessionaire;

3) It allows for establishment of baseline data to guide future management;

4) It protects existing use groups;

5) It will enable management to better determine shoreline capacities and balance shoreline uses;

6) It gives management more control to protect opportunity classes;

7) It provides more flexibility in responding to changing use patterns;

8) It emphasizes the quality rather than the quantity of the recreation experience;

9) It allows the Concessionaire to operate at contractual limits while establishing a ceiling on the number of occupied houseboats to maintain the desired balance of uses.

7.0 LICENSEE PROPOSED RECREATION FACILITY MANAGEMENT AND DEVELOPMENT

7.1 Recommended Actions

The following management actions are necessary to implement the recommended balance of uses.

Recreation Opportunity Spectrum (ROS)

Licensee will continue to manage Project lands under the land based ROS classification guidelines of Rural for developed recreation facilities and Roaded Natural for all other areas.

The reservoir surface will be managed under the water-based ROS classification guidelines of Urban Natural, Rural Natural, and Semi-Primitive Motorized, as designated in this plan.

Licensee will manage the Project in the short term so that the recommended balance of uses is not exceeded. However, the LAC process may identify the need to adjust use balances at a later date.

Limits of Acceptable Change (LAC)

Licensee will continue to use the LAC process in evaluating carrying capacities and maintaining a balance of uses.

The LAC process steps 3 and 4 (developing indicators and survey inventory) will continue to be developed and will be incorporated into the 1993 operating plan. The data will be analyzed, standards developed, and implementation will be initiated by the beginning of the 1995 recreation season. The Licensee and the USFS will be jointly responsible for this process.

Operating Plan

Licensee and the USFS will develop a joint operating plan which outlines operating responsibilities, details of daily management activities and implementation of the LAC process. The plan will be reviewed annually and modified as needed. Documentation of the joint agreement will be completed prior to April 15 of each year.

Overflow Camping

Licensee will manage camping at levels consistent with existing permit or design capacities. Overflow camping will not occur as this immediately exceeds the carrying capacity and balance of uses.

Inland Camping

In order to preserve the quality of the recreation experience and maintain a balance of uses, Licensee does not propose an increase in developed inland camping. Current and estimated future seasonal demand for inland camping will be met by the existing camping capacity. However, current and estimated future peak primary day demand will not be met.

Schoolhouse Campground will be rehabilitated by making the following improvements:

1. Replace existing klamath stoves with fire rings/barbecue pits;

2. Lengthen and widen approximately 75 percent of the spurs at existing sites to better accommodate modern vehicles;

3. Convert approximately 20 of the current single-family camping units to double-family camping units. This will entail managing two single sites as one and reducing the number of units from 67 to approximately 57. Design capacity will not be affected by this change. This measure should reduce vegetation damage within the campground caused by oversize groups;

4. Modify facilities to meet federal and state disability access standards;

5. Modify toilet facilities to meet the Forest Service's sweet smelling toilet standards (SST).

Hornswoggle Group Camp will be rehabilitated by making the following improvements:

1. Enlarge the parking area of the Sugar Pine site and add one new site with a capacity of 25 PAOT. The new site will be located along the existing fire break road and will provide parking, water, picnic tables, and garbage collection services;

2. Modify facilities to meet federal and state disability access standards;

3. Modify toilet facilities to meet the Forest Service's sweet smelling toilet standards (SST);

The following improvements will be made to the Dark Day Walk-in Campground:

1. Convert the campground to multi-family unit camping. This will eliminate five single camping units;

2. Lengthen existing parking areas to better accommodate modern vehicles;

3. Replace existing klamath stoves with fire rings/barbecue pits;

4. State and federal disability standards for the Project will be met.

This site has a low priority within the Project for meeting SST standards since it would require expensive replacement of the toilet buildings.

Licensee has determined through the course of this study that reopening of the Burnt Bridge Campground is not economically feasible. The following factors contributed to this conclusion:

1. Burnt Bridge Campground has been closed twice due to low use levels and vandalism;

2. Licensee believes that the historic low use at Burnt Bridge Campground is caused by the lack of reservoir access including boat launch and parking facilities;

3. Because of the physical constraints of the area surrounding the Burnt Bridge Facility, additional parking and boat launch demand can be met more cost effectively by expanding the existing facilities at Dark Day and Cottage Creek Boat Ramps.

Licensee will remove all improvements and restore Burnt Bridge Campground to the condition it was in prior to development of the facility.

Boat Access Camping

Licensee will manage Frenchy Point Boat Access Campground as dispersed shoreline camping. No sanitary facilities will be provided. No improvements are proposed for Madrone Cove and Garden Point Boat Access Campgrounds.

All dispersed boat access camping will require a permit, and a portable chemical toilet. Yuba County Ordinances and USFS regulations will be enforced.

Permit System for Boat Access Camping and Houseboats

Licensee will continue to manage boat access camping and houseboats by requiring all groups to obtain a shoreline camping permit. A limit will be established on the number of permits issued compatible with the shoreline carrying capacity identified in the LAC process. As interim management, a maximum of 74 Boat Access Camping permits will be issued and a maximum of 80 houseboats will be moored on the reservoir. On an annual basis, Licensee will develop houseboat management guidelines to insure that no more than 60 houseboats are occupied or in use at one time.

Law Enforcement

In an effort to create the feeling of coordinated quality management with minimal but effective regulation, an adequate law enforcement program is desirable for both boating and public safety. This will be accomplished through cooperative efforts between the Yuba County Sheriffs Department, California Highway Patrol, and the USFS. Licensee will continue to consult with the Yuba County Sheriffs Department and the USFS to ensure that law enforcement needs are met.

Boat Ramps and Parking

Existing design capacities for parking at the boat ramps are inadequate to meet current use levels. The proposal outlined below will accommodate present and estimated future average weekend use levels. However; it will not accommodate current peak use levels nor will it satisfy parking needs associated with the estimated social carrying capacity (420 BAOT). The proposed parking improvements will provide facilities for approximately 260 to 300 BAOT. Managed overflow parking areas will be used if necessary to accommodate the parking needs associated with peak use until maximum carrying capacities are developed. This proposal utilizes all Project lands that are cost effective and appropriate for development of parking facilities and will not over commit resources to development. State and federal accessibility standards will be met for parking and ramps.

Cottage Creek Boat Ramp currently has 112 parking units. Licensee will reconfigure the facility to a design capacity of approximately 350 parking units. In order to meet state and federal accessibility standards, the existing toilet facility on the boat ramp will be removed and a new disabled accessible facility will be constructed in the parking area. The area where the existing toilet is located will be managed to improve traffic flow on the boat ramp.

Dark Day Boat Ramp currently has 168 parking units. Licensee will add an additional parking area at Dark Day for approximately 240 parking units. This will result in a total parking capacity of approximately 408 units for the facility.

Picnic Areas

In order to maximize the parking capacity of the Cottage Creek Boat Ramp, the existing picnic tables will be removed from the south end of the parking area and a replacement site will be developed at a more attractive location on the east side of the dam.

Historical use and the 1991 user survey have indicated that there is no demand for picnic sites of the type offered at the Cottage Creek Picnic Area located one mile above the reservoir. In the recent past, the USFS has used the facility for overflow camping. However, use of the area for overflow camping is inconsistent with the balance of use concept outlined in this plan. Therefore, the Cottage Creek Picnic Area will be closed to all uses until there is a demonstrated need that is consistent with the goals identified in this plan.

The projected demand for picnic sites will be met by the existing picnic facilities at Dark Day, Sunset Vista Point, and the proposed site on the east side of the dam.

Undeveloped Reservoir Access

Unimproved roads providing unmanaged access to the reservoir conflict with the goals of this recreation plan. With the exception of Moran Road near the communities of Challenge and Greenville (see Figure 1.2), all roads of this type will be closed to motorized vehicles because they negatively impact visual quality, are difficult to manage, and conflict with other uses.

There is an opportunity to provide a primitive manageable access site at Moran Road (Co. Road 163). Improvement of this access point is consistent with the goals identified in this plan and provides access in an area where a need has been identified. Proposed development at this site consists of reconstructing 1/2 mile of unpaved road, enlarging an existing turn-around area to accommodate approximately six cars, and closing the road beyond the turn-around. No additional development is recommended for the site due to the potential to change use characteristics.

Interpretation

The goal of interpretation at the Project is to place a major focus on educating the public on issues pertinent to the agency and its goals. A clearer understanding of the Project's role in providing benefits and its relationship to the public would bring greater acceptance and support to Licensee.

An interpretive plan will be developed jointly between Licensee and USFS by 1995 and will address such issues as watershed management, hydroelectric operations, fisheries, and multiple benefits of the Yuba River Development Project.

Site Specific Environmental Assessments

Environmental assessments may be necessary before implementation of the proposed improvements. Licensee is responsible for identification and completion of any required environmental documentation.

Administration Site

As stated in Section 2.2.2, the Administration Site is for official use only by TNF Staff and is not open to the public. Licensee proposes that the Administration Site be deleted from the Exhibit R and the Project Boundary be redrawn to exclude this facility.

8.0 SCHEDULE AND COSTS

8.1 Financing

Subject to financing capabilities, Licensee will complete the proposed development for the Project in three phases, during a period of ten years from FERC approval of the Revised Exhibit R.

In 1992, the California Legislature diverted a portion of the tax levee returns traditionally provided to Enterprise Districts (Licensee is an Enterprise District) to the public school system. With the continued economic downturn in California, the State Legislature may further reduce funds provided to Enterprise Districts in the future. A reduction in state provided funds could substantially impact the Licensee's ability to finance the proposed recreation developments. The tax levee or grants are the only source of revenue available to the Licensee for recreation development. The Licensee has no authorization that would allow replacement of the tax levee.

Licensee proposed development costs are estimates based on average industry direct costs for 1992 and do not include costs for site specific environmental documentation.

8.2 Initial Phase Development

Construction of the initial phase development will begin two years after FERC approval of the Revised Exhibit R in order to allow Licensee adequate time for site plan engineering and design and to select a contractor for construction. The construction and rehabilitation of the following facilities will require two years to complete.

The Cottage Creek Boat Launch parking area will be reconfigured and 48,000 square feet of new pavement will be added to increase the parking capacity at this facility to approximately 100 vehicles with trailers and 150 single vehicles. The picnic tables currently located at the south end of the parking area will be removed, and a new picnic area will be developed at the southeast corner of the reservoir near the dam.

The total estimated cost of the redevelopment of the Cottage Creek Boat Ramp is $215,000. This estimate includes fog sealing 133,000 square feet of existing asphalt, adding 48,000 square feet of new asphalt, installation of barriers, removal and replacement of the existing toilet facility, and a 10 percent contingency.

Estimated cost of the relocation of the picnic units at the Cottage Creek Boat Ramp to the east side of the dam is $2,000.

The Cottage Creek picnic area will be permanently closed. Total estimated cost is $1,500 and will include signing, barricades, and removal of one structure.

All improvements at Burnt Bridge Campground will be removed and the site will be restored. Total estimated cost is $50,000 and includes the following: removal of tables, stoves, barriers, buildings, pavement and/or other improvements and road ripping, contouring, erosion control, and revegetation.

Moran Road (Co. Route 163), from the point where county maintenance ends to the proposed turnaround, a distance of approximately 1/2 mile, the road will be improved to provide primitive access to the reservoir. Total estimated cost of these improvements is $25,000 and includes the following: ripping, grading, improving drainage, vegetation removal, enlarging turnaround, installation of gates, barriers, and signing.

All remaining unimproved access roads to reservoir will be closed to motor vehicles. Estimated total cost is $1,500. This includes the cost of one gate and signs.

Temporary overflow parking will be developed to a minimal level. Licensee estimates this will be needed for a four-year period. Total estimated cost is $17,000. This estimate includes grading, signing, and shuttle service or trail.

8.3 Second Phase Development

Construction of the second phase development will begin no later than one year after the initial phase and will require two years to complete. Second phase development will include a new parking area at Dark Day and rehabilitation of the existing facilities. Estimated cost for this work is $320,000. This estimate includes construction of a new 70,000 square foot parking area, resurfacing, and striping of existing parking area, erosion control structure, accessibility modifications, and toilet building improvements.

8.4 Third Phase Development

Construction of the third phase development will begin no later than one year after the completion of the second phase development and will require two years to complete. The third phase will include rehabilitation of the Dark Day Campground, Schoolhouse Campground, and Hornswoggle Group Camp.

Total estimated cost of improvements at Schoolhouse Campground is $150,000. This estimate includes enlarging approximately 50 campsite spurs, repaving campsite spurs, fog sealing the internal road, replacing the existing klamath type campstoves with fire rings, converting approximately 20 single camping units to

double camping units, meeting accessibility requirements, engineering costs, and a 10 percent contingency.

Total estimated cost for the rehabilitation of the Dark Day Campground is $34,000. This estimate includes converting single family units to multiple family units, enlarging parking areas, replacing the existing klamath stoves with fire rings, meeting accessibility requirements, engineering costs, and a 10 percent contingency.

Total estimated cost of improvements at the Hornswoggle Group Campground is $51,000. This estimate includes enlarging the parking area at the Sugar Pine site, adding a new site with paved parking for eight self-contained recreational vehicles, eight picnic tables, water system, eight fire rings, meeting accessibility requirements, engineering costs, and a 10 percent contingency.

The total estimated cost for the proposed capital improvements outlined in this plan is $842,000.

9.0 AGENCY CONSULTATION AND COMMENTS

9.1 List of Agencies Consulted

County
1. Yuba County Sheriff's Department (YCSD)
2. Yuba County Planning Department (YCPD)

State
3. Secretary for Resources
4. State Historic Preservation Office (SHPO)
5. State of California Department of Parks and Recreation (CDP&R)
6. State of California Department of Boating and Waterways (CDB&W)
7. State of California Department of Fish and Game (CDF&G)

Federal
8. Tahoe National Forest (TNF)
9. Plumas National Forest (PNF)
10 Shasta - Trinity National Forest (STNF)
11. National Park Service (NPS)
12. U.S. Army Corps of Engineers (US ACE)
13. U. S. Fish and Wildlife Service (USFWS)

9.2 Record of Agency Consultation

Legend

Manner: Tel = Telephone Ltr = Letter Mtg = Meeting

Other Parties/Representatives:
YCWA = Yuba County Water Agency
CNS = Yuba County Water Agency Consultant
ECM = Emerald Cove Marina

Date	Manner	Party	Representatives	Purpose
5/10/91	Tel	TNF	P. Horning TNF, R. Howison CNS	Introduction to Project.
5/16/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Intro. to user survey.
5/28/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Set meeting Date for 6/6.
5/28/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Confirm meeting for 6/6.

Date	Manner	Party	Representatives	Purpose
6/6/91	Mtg	TNF	A. Steele TNF, B. Haire TNF, B. Petitt TNF, P. Horning TNF, I. French YCWA, N. Jones YCWA, R. Howison CNS, R. Stiving CNS	Discuss study plan issues and user survey.
6/13/91	Tel	TNF	A.Steele TNF, R. Howison CNS	Comment on user questionnaire.
6/28/91	Mtg	TNF	A. Steele TNF, F. Dearman TNF, R. Howison CNS, H. Thoma CNS	Discuss TNF assistance with user survey.
8/7/91	Tel	YCPD	K. Campbell YCPD, B. Bowman CNS	Acquire inf. on County Plan.
8/15/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Update on user survey.
8/21/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Discuss Nat. Res. Anlys.
8/21/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Set meeting to discuss Nat. Res. Anlys for 9/17/91.
8/22/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Confirm meeting of 9/12/91.
9/4/91	Tel	TNF	B. Petitt TNF, R. Howison CNS	Confirm meeting of 9/12/91.
9/4/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Request USFS RIM Data.
9/12/91	Mtg	TNF/PNF PNF	A. Steele TNF, B. Petitt TNF, B. Haire TNF, M. Heath PNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, R. Stiving CNS, R. Howison CNS, H. Thoma CNS	Discuss preparation of Revised Exhibit R.
9/13/91	Ltr	PNF	M. Heath PNF, R. Howison YCWA	Sensitive Biological Species.
9/17/91	Mtg	TNF	A. Steele TNF, B. Haire, TNF, B. Petitt TNF, S. Underwood TNF, K. Walden TNF, R. Howison TNF, B. Bowman TNF	Gather Nat. Res. data for analysis.
9/24/91	Tel	TNF	B. Petitt TNF, R. Howison YCWA	Information on Wild and Scenic Designation for the North Yuba River.
10/2/91	Ltr	TNF	B. Haire TNF, R. Stiving YCWA	Draft of Revised Exhibit R for TNF review.
10/3/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Notification of mailed draft.
10/11/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Discuss RIM Data.
10/22/91	Tel	CDP&R	Gen. Office CDP&R; R. Howison CNS	Request State Recreation Planning Information.

Date	Manner	Party	Representatives	Purpose
11/1/91	Tel	PNF	M. Heath PNF, R. Howison CNS	Discuss Spotted Owl Habitat in Project Area.
11/1/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Discuss Spotted Owl habitat near Burnt Bridge Campground.
11/6/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Request inf. on fire fuel loading for the Project.
11/6/91	Tel	CDF&G	J. Hiscox CDF&G, R. Howison CNS,	Fish stocking inf.
11/7/91	Tel	PNF	M. Heath PNF, R. Howison CNS	Set date for meeting on 11/26/91.
11/25/91	Ltr	TNF	B. Haire TNF, R. Howison CNS	Information on operation and maintenance responsibility.
11/26/91	Mtg	TNF\PNF	A. Steele TNF, R. Howison CNS, M. Heath PNF, G. O'Connor PNF	Discuss natural resource issues on PNF portion of Project.
12/12/91	Tel	CDP&R	C. Schmidle CDP&R, R. Howison CNS	Carrying capacity standards for boating activities.
12/17/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Discuss dates for Project meeting.
12/19/91	Ltr	TNF	A. Steele TNF, R. Howison CNS	Fire Fuels Information.
12/19/91	Tel	CDB&W	B. Curry CDB&W, R. Howison CNS	Boat Safety Standards.
1/14/92	Mtg	TNF	A. Steele TNF, B. Haire TNF, B. Petitt TNF, I. French YCWA, R. Stiving CNS, R. Howison CNS	Project meeting to discuss ROS and Carry Cap.
2/10/92	Ltr	PNF	G. O'Connor TNF, R. Howison CNS	Sensitive resources Plumas National Forest.
3/13/92	Tel	TNF	A. Steele TNF, R. Howison CNS	Set date of Project Meeting for 3/25/92.
3/23/92	Mtg	TNF	A. Steele TNF, I. French YCWA, R. Howison CNS, R. Stiving CNS	Survey facilities and discuss developmt needs.
3/24/92	Mtg	TNF	A. Steele TNF, R. Howison CNS	Discuss development needs.
3/25/92	Mtg	TNF	A. Steele TNF, R. Howison CNS	Discuss development needs.

Date	Manner	Party	Representatives	Purpose
3/26/92	Mtg	TNF	A. Steele TNF, B. Haire TNF, B. Petitt TNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, R. Howison CNS	Project meeting to discuss development alternatives carrying capacities.
3/31/92	Tel	TNF	A. Steele TNF, R. Howison CNS	Appropriate Group size for campsites.
5/8/92	Tel	TNF	A. Steele TNF, R. Howison CNS	Request RIM data for boat-access campgrounds.
5/12/91	Tel	TNF	A. Steele TNF, R. Howison CNS	Accuracy of RIM Data.
5/13/92	Tel	TNF	M. Heath PNF, R. Howison CNS	Removal of Burnt Bridge.
6/2/92	Ltr	PNF	C. Smay PNF, R Howison CNS	Closure of Burnt Bridge.
6/15/92	Tel	TNF	B. Petitt TNF, R. Howison CNS	Limits of Acceptable Change.
6/15/92	Ltr	TNF	B. Petitt TNF, R. Howison CNS	Limits of Acceptable Change.
6/16/92	Tel	TNF	B. Petitt TNF, R. Howison CNS	Limits of Acceptable Change.
6/17/92	Ltr	YCPD	D. Wilson YCWA, YCPD	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	YCSD	D. Wilson YCWA, YCSD	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	CDP&R	D. Wilson YCWA, D. Murphy CDP&R	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	SHPO	D. Wilson YCWA, S. Craigo SHPO	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	CDF&G	D. Wilson YCWA, J. Messersmith CDF&G	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	CDB&W	D. Wilson YCWA, D. Waltz CDB&W	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	Secy. for Resources	D. Wilson YCWA, Secretary for Resources	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	NPS	D. Wilson YCWA, J. Huddleston NPS	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	TNF	D. Wilson YCWA, B. Haire TNF	Transmittal of Draft Exhibit R for review and comment.

Date	Manner	Party	Representatives	Purpose
6/17/92	Ltr	PNF	D. Wilson YCWA, M. Heath PNF	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	TNF	D. Wilson YCWA, B. Petitt TNF	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	USFWS	D. Wilson YCWA, W. White USFWS	Transmittal of Draft Exhibit R for review and comment.
6/17/92	Ltr	US ACE	D. Wilson YCWA, D. Grothe US ACE	Transmittal of Draft Exhibit R for review and comment.
6/23/92	Ltr	TNF	J. Skinner TNF, R. Howison CNS	Limits of Acceptable Change.
6/24/92	Ltr	CDB&W	D. Waltz CDB&W, D. Wilson YCWA	Response to request for review of Draft Exhibit R, no comments.
7/1/92	Tel	TNF	A. Steele TNF, R. Howison CNS	Set meeting date for 7/9/92 to discuss USFS comments.
7/6/92	Tel	STNF	R. Howison CNS, M. Grigsby STNF	Discuss houseboat management on Shasta Lake.
7/7/92	Ltr	TNF	B. Petitt TNF, R. Howison CNS	Comments on Draft Exhibit R.
7/9/92	Mtg	TNF/PNF	P. Brost TNF, B. Haire TNF, A. Steele TNF, B. Petitt TNF, M. Heath PNF, T. Humpheries PNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, R. Stiving CNS, R. Howison CNS	Meeting to address TNF concerns and to propose resolution.
7/9/92	Ltr	NPS	J. Huddleston NPS, D. Wilson YCWA	Response to request for review of revised Exhibit R, no comments.
7/14/92	Tel	TNF	R. Howison CNS, B. Petitt TNF	Set meeting date for 7/21/92 to address TNF concerns.
7/15/92	Ltr	TNF	D. Wilson YCWA, J. Masquelier TNF	Collection agreement for planning work performed by TNF Staff.

Date	Manner	Party	Representatives	Purpose
7/16/92	Ltr	CDF&G	D. Wilson YCWA, J. Messersmith CDF&G	Comments on Revised Exhibit R.
7/21/92	Mtg	TNF	A. Steele TNF, B. Petitt TNF, R. Howison CNS	Set schedule to incorporate TNF comments into Revised Exhibit R.
7/22/92	Ltr	PNF	T. Humpheries PNF, B. Haire TNF, cc: R. Howison CNS	Closure of Burnt Bridge Campground.
7/29/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Mission and Goal statement.
7/30/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Discuss reservoir carrying capacity.
8/4/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Discuss reservoir carrying capacity.
8/5/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Discuss Limits of Acceptable Change.
8/6/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Limits of Acceptable Change.
8/11/92	Mtg	TNF	R. Howison CNS, A. Steele TNF	Discuss proposed facility improvements.
8/12/92	Mtg	TNF	R. Howison CNS, A. Steele TNF	Discuss proposed facility improvements.
8/19/92	Mtg	TNF	R. Howison CNS, A. Steele TNF	Discuss development potential at Burnt Bridge Campground.
8/25/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Boat Capacity and development needs.
8/26/92	Mtg	TNF/PNF	J. Masquelier TNF, B. Haire TNF, A. Steele TNF, B. Petitt TNF, M. Heath PNF, T. Humpheries PNF, R. Howison CNS, R. Stiving CNS	Discuss development potential of Burnt Bridge campground.
9/1/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Summarize resolution of USFS concerns.

Date	Manner	Party	Representatives	Purpose
9/2/92	Mtg	TNF	P. Brost TNF, B. Haire TNF, A. Steele TNF, B. Petitt TNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, R. Stiving CNS, R. Howison CNS	Meeting to build consensus on resolution of USFS concerns.
9/8/92	Tel	TNF	R. Howison CNS, B. Petitt TNF	Confirm meeting date of 9/9/92.
9/8/92	Tel	TNF	R. Howison CNS, A. Steele TNF	Discuss objectives for meeting of 9/9/92.
9/9/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Reservoir carrying capacity and preparation for meeting with emerald cove marina.
9/10/92	Mtg	TNF	I. French YCWA, N. Jones YCWA, A. Steele TNF, B. Petitt TNF, R. Howison CNS, B. Burton ECM, C. Burton ECM, M. Burton ECM	Discuss impacts of Draft Exhibit R to Emerald Cove Marina.
9/15/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Reservoir carrying capacity and recommended balance of uses.
9/16/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Reservoir carrying capacity and recommended balance of uses.
9/22/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Recommended Balance of Uses and Limits of Acceptable Change system.
9/23/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Recommended Balance of Uses and Limits of Acceptable Change system.
9/29/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Recommended Balance of Uses and Limits of Acceptable Change system.
9/30/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Reservoir Capacity and Balance of Uses.
10/7/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Reservoir Capacity and Balance of Uses.

Date	Manner	Party	Representatives	Purpose
10/8/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Limits of Acceptable Change and Balance of Uses.
10/14/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Summarize revisions to Revised Exhibit R.
10/15/92	Mtg	TNF	A. Steele TNF, B. Petitt TNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, R. Howison CNS, B. Burton ECM, C. Burton ECM, M. Burton ECM	Discuss impacts of Revised Exhibit R to Emerald Cove Marina.
10/16/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
10/21/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
10/22/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
10/23/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
10/26/92	Tel	TNF	R. Howison CNS, A. Steele TNF	Future Demand Estimates for BAOT.
11/3/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
11/4/92	Mtg	TNF	R. Howison CNS, A. Steele TNF B. Petitt TNF	Develop Final Draft of Revised Exhibit R.
11/5/92	Mtg	TNF	J. Masquelier TNF, B. Haire TNF, P. Brost TNF, A. Steele TNF, B. Petitt TNF, D. Wilson YCWA, I. French YCWA, N. Jones YCWA, J. Sohrakoff YCWA, J. Mistler YCWA, R. Landerman YCWA, R. Howison CNS, R. Stiving CNS, M. Burton ECM, C. Burton ECM	Final meeting for comment on Draft Revised Exhibit R.
11/6/92	Mtg	TNF	A. Steele TNF, B. Petitt TNF, R. Howison CNS, J. Vandel CNS	Field meeting to inspect Project facilities for ADA compliance.

Date	Manner	Party	Representatives	Purpose
11/12/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Prepare for presentation of Final Draft Exhibit R to YCWA Board of Directors.
11/13/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Prepare for presentation of Final Draft Exhibit R to YCWA Board of Directors.
11/16/92	Mtg	TNF	R. Howison CNS, A. Steele TNF, B. Petitt TNF	Prepare for presentation of Final Draft Exhibit R to YCWA Board of Directors.
11/17/92	Tel	TNF	R. Howison CNS, B. Petitt TNF	Management of Houseboats.
12/1/92	Ltr	CDF&G	D. Wilson YCWA, J. Messersmith CDF&G	Transmittal of Draft Exhibit R for review and comment.
12/1/92	Ltr	TNF	D. Wilson YCWA, B. Haire TNF	Transmittal of Draft Exhibit R for review and comment.
12/1/92	Ltr	PNF	D. Wilson YCWA, M. Heath PNF	Transmittal of Draft Exhibit R for review and comment.
12/1/92	Ltr	TNF	D. Wilson YCWA, B. Petitt TNF	Transmittal of Draft Exhibit R for review and comment.
1/11/93	Tel	TNF	R. Howison CNS, A. Steele TNF	TNF comments on Draft Exhibit R - Details to LAC.
1/19/93	Tel	TNF	R. Howison CNS, B. Petitt TNF	Discuss TNF comments on Draft Exhibit R.
1/21/93	Ltr	TNF	J. Skinner TNF, D. Wilson YCWA	Official comments on Draft Exhibit R.
1/22/93	Tel	TNF	R. Howison CNS, A. Steele TNF	Discuss TNF comments on Draft Exhibit R.
1/28/93	Tel	TNF	R. Howison CNS, A. Steele TNF	Inquire on comment letter not received.
1/28/93	Ltr	TNF	J. Masquelier TNF, D. Wilson YCWA	Official comments on Draft Exhibit R.

9.3 Agency Comments And Licensee Responses

The Draft Revised Exhibit R was mailed to the following agencies for comment on June 17, 1992. All agencies were asked to respond with written comments by July 24, 1992.

County
1. Yuba County Sheriff's Department (YCSD)
2. Yuba County Planning Department (YCPD)

State
3. Secretary For Resources
4. State Historic Preservation Office (SHPO)
5. State of California Department of Parks and Recreation (CDP&R)
6. State of California Department of Boating and Waterways (CDB&W)
7. State of California Department of Fish and Game (CDF&G)

Federal
8. Tahoe National Forest (TNF)
9. Plumas National Forest (PNF)
10 National Park Service (NPS)
11. U.S. Army Corps of Engineers (US ACE)
12. U. S. Fish and Wildlife Service (USFWS)

The following are the written comments received from agencies and the Licensee's response to comments.

United States Department of Agriculture | Forest Service | Tahoe National Forest
631 Coyote Street
P.O. Box 6003
Nevada City, CA 95959-6003
(916) 265-4531
FAX (916) 265-5820

Reply To: 2310

Date: JN 23

Pacific Gas and Electric Company
123 Mission Street, Room H-2059
San Francisco, CA 94106
Mr. Russell Howison

Dear Mr. Howison:

Enclosed please find comments on the Yuba River Development Project. As you will note, the Tahoe National Forest urges use of a system to identify, quantify, and monitor conditions on the ground which will become indicators for proactive management of the recreation area and its resources. Details on implementation of this process need to be refined with the Yuba County Water agency. Our intent is not to escalate costs of operation but to implement through use of existing staffing where conditions deem appropriate. Implementation of the "Limits of Acceptable Change" system will most likely save expenditures in the long run by use of preventative rather than reactive management.

We have been pleased with the opportunity to work cooperatively with PG&E and Yuba County Water Agency during the planning process and look forward to reviewing your draft management plan.

Sincerely,

JOHN H. SKINNER
Forest Supervisor

Enclosure

Forest Service Comments on the Yuba River Development Project (Bullards Bar)

The Forest Service proposes use of a system known as Limits of Acceptable Change (LAC). This is a planning/administration/monitoring system that has been in use in the agency for several years. This system focuses on actual changes that occur in the resource or social setting as a means of guiding or directing management actions in an area. Many recreation plans identify recreation or resource carrying capacities by assigning a number which correlates to the amount of use an area can potentially tolerate. These numbers, however, often fail to make a clear relationship between the amount of use and the quality of the recreation experience or the extent of environmental impact. The LAC system directs attention to identifying the desired resource and social conditions that best suit the area, and designing a management strategy to achieve and/or maintain them. It is a results oriented, logical process that assists in management of areas with increasing recreational demands.

A major theme in the LAC process is to identify indicators which provide quantitative documentation on how much conditions have changed. These indicators also help to identify trends and problems and can serve as an early warning to predict future conditions.

In an effort to support use of this concept, we have developed a set of draft or example indicators and actions for use at Bullards Bar. These are not a final product and are only included as a partial explanation of the process and its benefits. A complete LAC action plan would be developed within 2 years of approval of the recreation plan. This plan would be developed and implemented in coordination with Yuba County Water Agency. Additionally, as indicators are implemented we may find that they need to undergo changes in order to produce the appropriate information needed to evaluate a condition.

We approached the LAC process from two different viewpoints, that of the manager, and that of the user. Our first step was to describe the setting or experience one would like to find at Bullards Bar.

Desired Management Setting

The management perspective is to ensure that Bullards Bar Reservoir provides a desirable setting for a balanced range of opportunities and users. It will allow a variety of uses and will encourage compatible uses which compliment one another. No one use dominates the scene or be allowed to increase to the point where it displaces or causes excessive conflicts with other uses. There is a general feeling of coordinated, quality management and visitors are aware of a "user friendly" agency presence.

Desired User Setting

The user perspective, based on survey data collected at Bullards, focuses on specific conditions and experiences and includes the following as their desired setting.

* Rarely would I see evidence of old campsites and the shoreline and water surface are generally free of garbage and litter.

* I feel comfortable and safe on the water and generally don't feel other types of users are a conflict for me.

* I can generally find a campsite out of sound of others and out of sight of most other groups.

* A variety of wildlife can readily be seen once I have left the boat ramps and/or marina areas.

* The whole area is generally free of excessive noise.

* I have the feeling that there is an agency management presence but that presence is not intrusive.

* Rarely will I see evidence of use in the forested area above the high water mark.

* Day users can generally find a site on shore that is out of sound of most other parties.

** Note: The term "agency" in this discussion is used in the broad sense, it could mean Yuba County Water Agency, Forest Service, County Sherriff, or any other uniformed or otherwise identified management presence.

The next step was to develop indicators of each of the identified desired conditions, to list ways to collect information that would measure the indicator, and to offer some suggested management actions that could potentially be implemented if indicators and their thresholds identified a need for change.

Desired Condition: Rarely would I see evidence of old campsites and the shoreline and water surface are generally free of garbage and litter.

Indicator(s):
Presence of litter, firepits, charcoal/ash, abandoned shelters.

Presence of manmade landscape changes (terracing, etc.)

Methods of collecting information:
Onsite counts of old campsites
User surveys to measure public perception
Identify new camp locations in use as a result of others becoming undesirable.

Potential Management Actions:
Develop and implement a user education program
Develop new regulations
Change the number and/or location of campsites
increase staffing for clean-up, education, and enforcement

Desired Condition: I feel comfortable and safe on the water and generally don't feel other types of users are a conflict for me.

Indicator(s):
- New types of uses or equipment - not previously used
- Number of violation notices for boating moving violations
- Significant change in the ratio of users per type (ie. ratio of fishermen to skiers, to houseboats, etc.) - would need to examine why the change was occurring
- Noticeable increase in numbers of jet skis and/or high speed boats
- Users do not see presence of agency personnel on the reservoir
- Number of user complaints
- Number of boating accident reports

Methods of Collecting Information:
- Survey users for opinions and input
- Reported incidents and complaints
- Agency observations, reports, and surveys

Potential Management Actions:
- Increase staffing to improve agency presence
- Develop user education program focused on rules, regulations, and boating etiquette
- Develop new restrictions on:
  - Types of use
  - Hours of use
  - Areas where use is allowed
  - Activities allowed
  - Types and/or sizes of equipment allowed

Desired Condition: I can generally find a campsite out of sound of others and out of sight of most other groups.

Indicator(s):
- Number of camping permits sold
- Number of complaints/comments
- Frequency and number of available campsites out of sound of other campers

Methods of Collecting Information:
- Physical count of camping permits and complaints
- User survey to gain understanding of public perception

Potential Management Actions:
- Reduce the number of permits available
- Require designated campsites
- Intensify enforcement
- Increase user fees
- Examine the number of houseboats using shoreline sites vs. other users

Desired Condition: A variety of wildlife can readily be seen.

Indicator(s):
- Number of different species observed
- Numbers of individuals per species observed
- Locations where observed

Methods of Collecting Information:
- Observations and counts by agency personnel
- User surveys

Potential Management Actions:
- Reduce number of camping permits sold
- Restrict camping to certain areas
- Reduce noise levels in the area
- Seasonal restrictions to meet species needs

Desired Condition: The whole area is generally free of excessive noise.

Indicator(s):
- Campers are kept awake by others (boats, people in other campsites, domestic animals)
- Boating equipment exceeds regulated decibel levels
- Other users and sounds of equipment (radios, generators) are generally not heard at distances greater than _____ feet (distance to be defined in subsequent planning steps).

Methods of Collecting Information:
- Numbers of complaints
- Number of incidents handled
- Agency observations
- Number of violations issued
- Sound testing surveys by agencies

Potential Management Actions:
- Increase enforcement
- Regulate or prohibit certain types of uses or equipment by hours of use, areas of use, etc.
- Implement an education program which includes signing at access points
- Do not sell camping permits to repeat violators

Desired Condition: I have the feeling that there is an agency management presence but that presence is not intrusive.

Indicator(s):
- Number of vandalism incidents
- Number of complaints regarding condition of facilities (campsites, boat ramps, toilets, trash, etc.)
- Number of times per visit agency personnel are seen
- Number of complaints of over-regulation or conflict with agency personnel
- Number of violations - as witnessed by others

Methods of Collecting Information:
- Agency reports - citations, complaints, incident reports

User surveys
Survey by management personnel of facility conditions

Potential Management Actions:
Increase personnel for maintenance and public contact
Review communication approaches (signing, permit, brochure, etc)
Increase or improve training for public contact personnel - provide training in the "Host Role"

Desired Condition: Rarely will I see evidence of use in the forested area above the high water mark.

Indicator(s):
Presence of firerings, tent pads and/or litter
Evidence of human waste
Presence of unplanned trails
Depletion of forest litter - vegetation damage

Methods of Collecting Information:
Physical survey in selected areas

Potential Management Actions:
Validate effectiveness of existing permit system and improve if necessary
Increase enforcement of existing regulations
Implement new regulations if necessary such as:
Users must bring additional toilets or equipment per group
Restrict camping to specific locations
Restrict open campfires in order to reduce firewood gathering
Management adds additional toilet facilities

Desired condition: Day users can generally find a site on shore that is out of sound of most other parties.

Indicator(s):
Frequency and number of available day use sites out of sound of most other parties
Number of complaints and/or comments
Number of camping permits sold

Methods of Collecting Information:
Physical count
User survey

Potential Management Actions:
Reduce the number of camping permits available
Examine the number of houseboats using shoreline sites vs other users
Increase use fees
Intensify enforcement
Require designated sites

As an LAC plan is developed, indicators, methods, and actions will be more fully explored and defined and threshold or trigger points for each item will

be established. Maintaining a quality recreation experience at Bullards Bar is a key factor in the overall recreation plan. The Limits of Acceptable Change Process will help us to maintain that experience level by providing measurable factors that will give us a clearer picture of the level of change that occurs at the reservoir over time thus ensuring appropriate management action before it is too late to correct a situation.

Fax Recieved From USFS 7-7-92

What happens when threshold is reached, regardless of number? And how tie to L.A.C.?

Identify incompatible uses and/or equipment and recommend action;

ie. recreation events, boat races, paragliding, size and horsepower of equipment, noise levels of certain types of equipment, placement of water-ski buoys.

Discussion of maintenance of reservoir pool levels during recreation season (approximately May thru September).

Disability access overall.

Regional growth rates (page 5-11)
(conclusion reached form table are not substantiated. Does not correlate with our experience and use figures) (re-examine)

Campground (page 5-14)
Making recommendations based on information with low reliability. Dealing only with demand, not experience level. What is the relationship.

How can we reduce or eliminate marketing of area in order to slow down reaching use threshold and better serve public for experience level and expectation upon arrival at area.

STUDY PLAN OF DEFICIENCIES:

Is not a management plan, addresses only facilities, but does not tie recommendation to experience levels/setting. (page 1)

Carrying capacity (page 2)
There are numbers, but we don't understand some and disagree with others.

Long term needs (page 2)
no documentation, rationale, etc. for items discussed informally, therefore there are no conclusions, or management direction.

F & W issues, same as above.

Law Enforcement (page 3)

Interpretive potential (page 3)

Carrying capacity (page 3)
addressed, but major question and disagreements.

Adequacy and use assessment (page 4)
Did an assessment, by no rational, discussion, etc. for any conclusions???
The "mix" not addressed. Jumped right to 420 with out discussion of impacts or options.

Id. audit or future facility need (page 4)
same as above, and "optimum levels ("mix") of use for each type" absent.

Many Forest Service concerns were discussed, identified in the plan (lip service) but not thoroughly addressed and resolved.

Lots of Forest Service involvement/participation up from in early periods, but little to none in developing the implementation/recommendation portion of document. This is the important part!

Forest Service had expectation L.A.C. process was going to be used. Doesn't appear it was. Did we have miscommunication here?

Other than physical facilities, no firm, solid management direction given. (problem-solving)

Plan does not address what study plan said it would.

Plan does not deal with specifics of management and condition that currently exist. Is it already outdated?

SPECIFICS:

Houseboats:

- Number, size
- Ratio of rentals to private
- Limit on rentals? (number of boats; days of week)
- Options to reduce from 80 to be more compatible
- Discussion of impacts of houseboats on other uses/users.
- Discussion of a "balance" of uses was not developed, how to validate any numbers?

Look at reducing mooring number below 80.

Establish L.A.C. Standards, monitoring schedule and responsibility. (page 5-9)

Matrix of other reservoirs and facilities.

Frenchy Point needs to be officially deleted form existing plan.

Improve efficiency/effectiveness of boat ramps.

- striping lanes
- floating docks
- prep areas
- signs/etiquette
- staffing
- lengthen ramps?
- Parking with marina shuttle for moored customers.
- Parking for 80 moored boat parking spaces not addressed.

Parking:

Need for 80 moored boat parking spaces not addressed.

Segregation? Day use-Over night, advant/opport

Dry storage for boats (in and off season)

How is experience tied to (affected by) identified carrying capacities or facilities proposals, including increase in houseboats, camping permits, etc. 60% now feel crowded at the existing level. How can an increase be justified? (Reference page 4-5, Section 4.3)

Highly concerned with identified number of 420.

United States Department of Agriculture | Forest Service | La Porte Ranger District | P.O. Drawer 369 Challenge, CA 95925

Reply to: 2310

Date: July 22, 1992

Mr. Bill Haire
North Yuba Ranger District
Tahoe National Forest
Star Route, Box 1
Camtonville, CA 95922

Dear Bill:

This letter is in response to the July meeting with the Tahoe National Forest, Plumas National Forest, Yuba County Water Agency, and PG&E, regarding the Recreation Plan for Bullards Bar Reservoir. The main concern that we have is the status of Burnt Bridge Campground, the only developed campground on the Plumas National Forest side of Bullards Bar. We would like this facility to remain part of the plan, although it is not currently in operation.

In the future we would like to reopen Burnt Bridge Campground, providing access to the reservoir from the campground. This access may be in the form of a partial road/partial trail to the water, picnic area, cartop launch, or regular boat launch. The extent of access to be provided to the water will be determined at a later date, working with the Tahoe National Forest. This campground may be open to the general public, or as a group campground available by reservation only. A group campground is desireable, as we do not offer any group camping facilities on this district, and a need for group camping facilities has been expressed by the public.

We feel that Burnt Bridge Campground should remain part of the Recreation Plan for future renovation and development in order to provide access to Bullards Bar Reservoir for the local communities of Brownsville, Challenge, and Clipper Mills, as well as for the increasing numbers of visitors from the Sacramento Valley. Currently, there is no access to Bullards Bar on the Plumas side of the reservoir.

We would like this letter to act as documentation of our input on the Recreation Plan for Bullards Bar Reservoir. If you have any questions, please call me at the Challenge Ranger Station (675-2462). We look foreward to continuing to work with you on this plan in the near future.

Sincerely,

Tricia Humpherys

PATRICIA D. HUMPHERYS
Recreation Planner

Caring for the Land and Serving People

cc: Russ Howison, PG&E

FS-6200-28(7-82)

In a meeting held on 7/7/92 it was agreed by TNF, PNF, and Licensee that the most effective way to address the comments identified above was to hold a series of meetings between TNF and Licensee staff from July through November 1992. During this period the written text was revised to incorporate these concerns.

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
EGION 2
01 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CALIFORNIA 95670
(916) 355-7020

July 16, 1992

Mr. Donn Wilson
Yuba County Water Agency
1402 D Street
Marysville, California 95901-4226

Dear Mr. Wilson:

The California Department of Fish and Game (DFG) has reviewed the revised recreation plan (Exhibit R) for the Yuba River Development Project (FERC No. 2246) dated June 1, 1992. DFG has the following comments and concerns regarding this document:

1) An error has been made on page 3-5, paragraph 1. The numbers of fingerling Kokanee salmon released by DFG annually should read "220,000 to 250,000" instead of "22,000 to 25,000" as written.

2) The draft recreation plan only addresses Bullards Bar Reservoir. Other project features which should be included in the final plan include Hour House Diversion Dam and Log Cabin Diversion Dam. Both of these areas provide heavy seasonal recreation use for angling activities. Issues of concern to DFG in those areas include increased angler access (including handicapped angler access structures) as well as garbage and toilet facilities. A maintenance schedule for said facilities should also be addressed.

3) Although the subject plan identifies inadequate boat ramp parking facilities at Bullards Bar Reservoir as a primary concern for existing and anticipated recreational use at the facility, no proposal was included in the plan for upgrading or expanding facilities at the Dark Day ramp. DFG concurs with the proposed upgrades at the Cottage Creek boat ramp.

4) One of the primary limitations at Bullards Bar is that imposed by high speed boat use in restricted geographical areas of the lake. DFG recommends

that the proposed areas for ROS-SPL designation (semi-primitive low speed boating areas) be expanded to include all coves adjacent to Burnt Bridge Creek, Little Oregon Creek, Indian Creek, Empire Creek and Bridge Creek. The plan should specify the use of buoys to identify these low-speed areas and provide for increased speed limit enforcement on the entire lake.

Thank you for the opportunity to review your draft recreation plan. If you have any questions on our comments please contact Mr. Patrick O'Brien, Fisheries Management Supervisor, at (916) 355-7090, or Mr. John Hiscox, Associate Fishery Biologist, (916) 265-0805.

Sincerely,

James D. Messersmith
Regional Manager

cc: Mr. Patrick O'Brien
Region 2

Mr. John Hiscox
Region 2

Responses to comments outlined in the letter of July 16, 1992 from the California Department of Fish and Game are provided below.

Response to Comment 1

The error in the figures regarding the numbers of fingerling Kokanee salmon released by CDF&G each year have been corrected per the Departments request.

Response to Comment 2

The FERC approved Recreation Plan of 1970 did not identify a need for recreation facility development at Our House and Log Cabin Diversion Dams. As the result of a public use and environmental inspection conducted in 1985, FERC determined that conditions of certain recreation facilities at New Bullards Bar Reservoir were unsatisfactory. The 1985 FERC request for a Revised Exhibit R, and subsequent communication between Licensee, USFS, and FERC in 1990-91 regarding the Study Plan for the Revised Exhibit R did not identify the need to study this portion of the Project. Licensee has always permitted public access to these areas. However, the existing access roads to these two areas cross private lands. Due to vandalism to private lands and licensee facilities, the road to Log Cabin Diversion Dam has been closed to vehicular traffic. On several occasions the security locks for flow control devices at Log Cabin Diversion Dam have been broken and valves and gates operated altering the intended flows to the Camptonville Tunnel and downstream. The area is accessible to the public by foot. The road to Our House Diversion Dam is open to the public and provides unrestricted access. Chemical toilets are currently provided at both facilities. As part of the routine operation and maintenance schedule for the Project, Licensee's power system staff visit both diversion dams approximately 3-4 days per week including regular weekend visits. Observations by Licensee staff indicate that current use at the Our House and Log Cabin Diversion Dams is not significant enough to demonstrate a need for any further development at these two facilities. Recreation studies for all Project features will be conducted as part of the project relicensing process which will be completed by the current license expiration date of 2016.

Response to Comment 3

Licensee has proposed significant improvements to the Dark Day Boat Ramp including expanding the parking capacity by approximately 240 units. A more detailed discussion of the proposed developments for the project is provided in Section 7.0.

Response to Comment 4

Closure of cove areas to high speed use may only produce marginal benefits due to the steep topography and large fluctuation in water levels during the recreation season. Further discussion between Licensee and CDF&G is needed to clarify the potential benefits and determine the feasibility of closing these areas.

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF BOATING AND WATERWAYS
1629 S STREET
ACRAMENTO, CA 95814-7291
(916) 445-6281

June 24, 1992

Mr. Donn Wilson
Engineer-Administrator
Yuba County Water Agency
1402 D Street
Marysville, CA 95901-4226

Dear Mr. Wilson:

This is in response to your letter of June 17, 1992, to the Department of Boating and Waterways concerning your Agency's Revised Recreation Plan required by the Federal Energy Regulatory Commission.

The Department has no comment on the Recreation Plan. Thank you for the opportunity to review and comment on the report.

Sincerely,

BILL S. SATOW
Interim Director

By Don Waltz

DON WALTZ
Acting Chief

United States Department of the Interior

NATIONAL PARK SERVICE
Western Region
600 Harrison Street, Suite 600
San Francisco, California 94107-1372

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

L7619(WR-RP)

July 9, 1992

JUL 1992
RECEIVED
YUBA CO. WATER AGENCY

Mr. Donn Wilson
Engineer-Administrator
Yuba County Water Agency
1402 D Street
Marysville, California 95901-4226

Dear Mr. Wilson:

This responds to your recent letter regarding the revised Exhibit R for the Yuba River Development Project (FERC #2246), Yuba County, California.

The revised Exhibit R appears to thoroughly address recreation needs of the project and the record of consultation appears complete. With regard to adequacy of the facility proposals, we defer to the comments you will receive from the Plumas and Tahoe National Forests, the affected land managers in the project area.

Thank you for submitting your proposal. While these comments may be considered as compliance with your requirement for consultation with the National Park Service, they are based on a preliminary review and should not be regarded as the official comments of either this agency or the Department of the Interior. Formal comments will be submitted when the Revised Exhibit R is accepted by the FERC and distributed to federal agencies for review. If you have any questions or need additional information, please contact me either at the letterhead address or at telephone number (415) 744-3968.

Sincerely,

James R. Huddlestun
Regional Environmental Coordinator
Western Region

No response was necessary for the letters from California Department of Boating and Waterways and the National Park Service. No written responses to Licensee's request for comments were received from the following agencies.

1. Yuba County Sheriff's Department
2. Yuba County Planning Department
3. State Historic Preservation Office
4. State of California Department of Parks and Recreation
5. U.S. Army Corps of Engineers
6. U. S. Fish and Wildlife Service

No response was necessary for the letters from California Department of Boating and Waterways and the National Park Service. No written responses to Licensee's request for comments were received from the following agencies.

1. Yuba County Sheriff's Department
2. Yuba County Planning Department
3. State Historic Preservation Office
4. State of California Department of Parks and Recreation
5. U.S. Army Corps of Engineers
6. U. S. Fish and Wildlife Service

United States Department of Agriculture | Forest Service | Tahoe National Forest
631 Coyote Street
P.O. Box 6003
Nevada City, CA 95959-6003
(916) 265-4531
FAX (916) 265-5820

Reply To: 2310

Date: JAN 2 1 1993

Donn Wilson
Engineer-Administrator
Yuba County Water Agency
1402 D Street
Marysville, CA 95901

Dear Mr. Wilson:

In response to your request for comment on the FERC Revised Exhibit R for the Yuba River Development Project I would like to offer the following.

I appreciate the level of cooperation and the quality professional relationship that was exemplified during our joint development of the second draft of the Revised Exhibit R. I am aware that there have been some issues that have caused Yuba County Water Agency and the Forest Service some concern, most notably the management of houseboats, and the determination of the total number and type of users at the project. However, I feel that the agreement that both agencies have reached ie. a maximum of 80 houseboats will be allowed on the reservoir but 60 may be in use at any one time, will provide for the best level of interim management while meeting each agency's concerns. I am also pleased that the Limits of Acceptable Change process has been incorporated into the plan and will be used continuously to develop, monitor, and modify management actions as needed in order to maintain the quality recreation experience that is identified in the Mission and Goals of the Revised Exhibit R.

I fully support the second draft of the Revised Exhibit R as it is written and look forward to working with you and your staff during implementation of this plan.

Sincerely,

JOHN H. SKINNER
Forest Supervisor

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Downieville Ranger District
15924 Highway 49
Camptonville, California
95922-9707

Reply To: 2770/2350

Date: JAN 28 1993

Mr. Donn Wilson
Yuba County Water Agency
1402 D Street
Marysville, CA 95901

Dear Mr. Wilson:

Although I wasn't here at the beginning of your planning process, I have observed in the last nine months a strong sense of commitment by the Yuba County Water Agency to develop a recreation plan with a vision that maintains or embraces the recreation experience at New Bullards Bar Reservoir. I have reviewed revised exhibit R and commend you for your development of a dynamic planning document that addresses difficult issues. I believe your development of carrying capacities based on ROS classes and your commitment to make this a living document by using the limits of acceptable change process will provide a guide post for recreation management at New Bullards Bar that will be capable of responding to the unknown future.

The Downieville District of the Tahoe National Forest fully supports revised exhibit R draft II. We also recognize our responsibility to work with your agency to carry out the proposed plan. We are committed to management that supports the mission and goals of this recreation plan.

I would like to thank you and others of the Yuba County Water Agency for your support and co-operation in what I believe was a team effort to produce a recreation plan that may become the standard for flat water recreation plans.

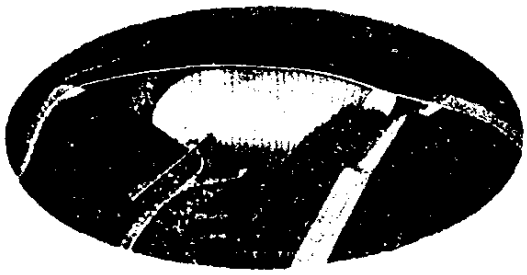
Sincerely,

Robert Ray Wallow

JEAN M. MASQUELIER
For District Ranger

YUBA COUNTY WATER AGENCY

1402 D STREET
MARYSVILLE, CALIFORNIA 95901-4226
TELEPHONE (916) 741-6278
FAX (916) 741-6541



December 1, 1992

Mr. James D. Messersmith, Regional Manager
California Department of Fish and Game, Region 2
1701 Nimbus Road
Rancho Cordova, CA 95670

Dear Mr. James D. Messersmith:

In response to a Federal Energy Regulatory Commission (FERC) request of August 13, 1985, for a Revised Recreation Plan, the Yuba County Water Agency is preparing a Revised Exhibit R (Recreation Plan) for the Yuba River Development Project (FERC 2246).

FERC regulations require consultation with the appropriate federal, state, and local resource agencies as part of the planning process. Attached for your information and review is the second draft of the Revised Exhibit R. This second draft was developed in response to comments made by the US Forest Service and California Department of Fish and Game. Therefore, the second draft is only being sent to those agencies who commented on the original draft. Please review this draft and submit your written comments to:

Donn Wilson
Engineer-Administrator
Yuba County Water Agency
1402 D Street
Marysville, CA 95901

Because of the approaching FERC filing deadline of March 1, 1993, we need your comments by January 22, 1993. If you have any questions on the enclosed Recreation Plan, please call me at (916)741-6278.

Sincerely,

Donn Wilson
Engineer-Administrator

Encl.

No response was necessary for the letters received from the Supervisors and District Offices of the Tahoe National Forest and the California Department of Fish and Game. No Comments were received from the Plumas National Forest.

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APPENDIX A

RECREATION USER SURVEY FORMS

1991 NEW BULLARDS BAR RESERVOIR OBSERVATION FORM

Site Name _____ Date_____ Time_____

Temperature ___ Cloud % ___ Wind ___ Rain___

GROUPS
- Day
- Overnight

VEHICLES

CAMPING EQUIPMENT
- Camper\Van-PU
- Motorhome
- Tent
- Sml Camp Tlr-Popup
- Lg Camp Tlr 5th Whl

BOATS & EQUIPMENT
- Empty Bt Tlr
- Loaded Bt Tlr
- Empty Cartop BR
- Loaded Cartop BR
- BOAT TYPES
  - Motorboat
  - Rowboat-Canoe, etc.
  - Houseboat
  - Sailboat
  - Sailboard
  - Jet Ski

OTHER EQUIPMENT
- Bicycle
- Cargo Trailer
- OHV's
- Motorcycles

QUESTIONNAIRES

Date _____ Time_____ am pm ID#_____

Site (please circle)

1. Cot Crk Bt Rmp	4a. Sclhs Adv Res	6. Drk Dy Cmp	9. Frncy Pt Cmp	12. Cot Crk Ovflw Cmp
2. Snst Vis Pt	4b. Sclhs Slf Res	7. Drk Dy Pic	10. Mdrn Cv Cmp	13. Shoreline Cmp
3. Hrns Grp Cmp	5. Drk Dy Bt Rmp	8. Grdn Pt Cmp	11. LOC Undv BR	

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YUBA COUNTY WATER AGENCY
NEW BULLARDS BAR RESERVOIR RECREATIONAL USE SURVEY
RECREATION USER QUESTIONNAIRE

Dear Visitor:

We need your help! This questionnaire is part of a recreation study for the New Bullards Bar Recreation Area. The study is being conducted by the Yuba County Water Agency with assistance from the U.S. Forest Service and Pacific Gas and Electric Company, to assess current and future recreation needs for this area. Information gathered from this questionnaire will help determine the way recreation use at New Bullards Bar Reservoir is managed in the future. **Please** fill out the questionnaire using a pen or pencil, fold it with PG&E's address showing, staple or tape it closed, and drop it in the nearest mailbox.

Your help will be greatly appreciated. If you have questions or comments regarding the recreation study or this questionnaire, feel free to call us collect at (415) 973-5862. **Thank You!**

Q-1. Please indicate the Zip Code where you live. _ _ _ _ _

Q-2. A) How many people are in your group? _____

Q-3. A) When did you arrive at the Reservoir: Date _____ Time _____

B) When did you leave the Reservoir: Date _____ Time _____

Q-4. How many vehicles did you and your group use to travel to the Reservoir? Number of vehicles _____

Q-5. How many of each of the following boats did your group use during your visit?

___ Motorboats (please specify HP of each) _____ _____ _____
___ Hand propelled boats (rowboat, canoe, etc.) ___ Patio boats
___ Houseboats ___ Sailboats ___ Sailboards ___ Jet skis

Q-6. A) For a typical day during your visit, how many members of your group participated in each of the following daytime activities?

___ 1. Picnicking
___ 2. Pleasure boating
___ 3. Fishing (from Shore)
___ 4. Fishing (from Boat)
___ 5. Hiking/walking
___ 6. Nature Study
___ 7. Swimming/wading
___ 8. Sunbathing/relaxing
___ 9. Waterskiing
___ 10. Jetskiing
___ 11. Windsurfing
___ 12. Other (specify below)

_____

B) Which of these is your primary recreation activity? Please choose only one Activity Number, _____.

C) Using Scale A, please circle the number which represents how crowded you felt while pursuing your primary recreation activity.

SCALE A

1	2	3	4	5	6	7	8	9
Not at all Crowded			Slightly Crowded		Moderately Crowded		Extremely Crowded	

D) Please indicate with an **X** on the map provided any areas where you felt crowded.

E) When you are engaged in your main daytime recreation activity, what is the minimum distance (in yards) you want other recreation groups to be from you? (Remember, there are 3 feet in 1 yard and a football field is 100 yards.)

___ 5 yards ___ 10 yards ___ 20 yards
___ 50 yards ___ 100 yards ___ 500 yards
___ 1,000 yards ___ Other (Please specify) ____ yards

Q-7. Did you experience any problems or conflicts with other groups while pursuing your primary recreation activity?

___ Yes (please explain) _____
___ No

Q-9. We are interested in identifying what recreation items you feel are important at New Bullards Bar Reservoir and your level of satisfaction with them. Using Scales C and D please rate the items below.

For items that you are dissatisfied with, please give the reason for your dissatisfaction in the space provided.

Scale C: IMPORTANCE		Scale D: SATISFACTION	
Not important	= 1	Very dissatisfied	= 1
Somewhat important	= 2	Dissatisfied	= 2
Important	= 3	Neutral	= 3
Very important	= 4	Satisfied	= 4
Extremely important	= 5	Very Satisfied	= 5

	IMPORTANCE	SATISFACTION	REASON FOR DISSATISFACTION IF APPLICABLE
1) Cleanliness	___	___	_____
2) Safety of Boating Conditions	___	___	_____
3) Security	___	___	_____
4) Camping Areas	___	___	_____
5) Picnic Areas	___	___	_____
6) Boat Launching Facilities	___	___	_____
7) Comfort Stations	___	___	_____
8) Hiking Opportunities	___	___	_____
9) Water Quality	___	___	_____
10) Natural Setting	___	___	_____
11) Number of Boats on Reservoir	___	___	_____
12) Camping Experience	___	___	_____
13) Enjoyment of Primary Recreation Activity	___	___	_____

Q-10. Why did you choose to visit this reservoir over other reservoirs in the area? _____

_____

Q-11. Finally, is there anything you would like to tell us about this recreation area that was not covered in this questionnaire?

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME!

BOATING\SHORELINE SURVEY:

Date _____ Time _____ Area _____

Shoreline Questions:

Site locale in shoreline Miles _____

Number of Groups using shoreline area _____.

Q-1. Are you here for the day or are you camping on the shoreline overnight? ___ Day Group ___ Overnight Group

Q-2. When did you arrive at this area? Date _____ Time ____
When do you expect to leave this area? Date _____ Time ____

Q-3a. Using Scale A Please tell me how crowded you feel this shoreline site (usable beach area where your group is located) is.

Q-3b. Using the same scale, please tell me how crowded you feel this entire (visible) shoreline area is.

SCALE A

1	2	3	4	5	6	7	8	9
Not at all Crowded			Slightly Crowded		Moderately Crowded		Extremely Crowded	

Q-5. What is the minimum distance (in yards) that you want the nearest Shoreline user group to be from you? (Remember that a football field is 100 yards.) Distance _____ yds.

Q-6. What is the maximum number of groups that could be present in this shoreline area before you felt crowded? _____

Q-7. Using scale B please tell me how much difficulty you had in locating this site.

SCALE B

1	2	3	4	5	6	7	8	9
Not at all Difficult			Slightly Difficult		Moderately Difficult		Extremely Difficult	

Boating Questions: **Lake Zone** _____

Number of Boats in Lake Zone (not beached) and Type of each.
___ Motorboats ___ Jet Ski ___ Houseboat ___ Patio Boat
___ Nonmotcrized Bts ___ Sailboat ___ Sailboard
___ Total

Q-1. What is your primary boating activity? ___ Pleasure boating
___ Fishing from boat ___ Water skiing ___ Jet skiing
___ Other (specify) _____

Q-2. Show map of the reservoir with Zones and ask: Which of the illustrated reservoir zones have you used today?

A B C D E F G H I J K L M N O P Q

Q-3. Using Scale C Please tell me how crowded you feel the water surface of the Zone we are in presently is?

SCALE C

1	2	3	4	5	6	7	8	9
	Not at all Crowded		Slightly Crowded		Moderately Crowded		Extremely Crowded	

Considering the Zone we are presently in:

Q-4. What is the largest number of **ski boats** the area could have before it became unfavorably crowded? _____

Q-5. What is the largest number of **fishing boats** the area could have before it became unfavorably crowded? _____

Q-6. What is the largest number of **house boats** the area could have before it became unfavorably crowded? _____

Q-7. For this area, **assuming the present mixture of boats**, what is the largest number of boats the area could have before it became unfavorably crowded? _____

Q-8. When you are engaged in your primary boating activity, what is your preferred distance between you and the boat nearest you.
Preferred distance _____ yds.

Q-9. What boat launching facility did you use?
____ Cottage Creek _____ Dark Day ____ Other
____ Other, please specify _____

Q-10. Other Comments _____
_____
_____
_____

APPENDIX B

RECREATION USER SURVEY DATA

FACILITY OCCUPANCY DATA

Table B.1
Campground Occupancy Rates 1990

Campground Facility	Primary Days	Secondary Days	Season
Schoolhouse Camp	83.2%	27.0%	45.4%
Dark Day Tent Camp	51.7%	8.3%	22.5%
Hornswoggle Camp	N/A	N/A	N/A
Madrone Cove BAC	97.1%	52.0%	66.7%
Frenchy Point BAC	95.0%	33.3%	53.5%
Garden Point BAC	96.6%	57.5%	70.3%
Shoreline Camping	/0.8%	32.3%	44.9%

Table B.2
Campground Occupancy Rates 1991

Campground Facility	Primary Days	Secondary Days	Season
Schoolhouse Camp	88.0%	38.5%	54.6%
Dark Day Tent Camp	76.8%	9.4%	32.0%
Hornswoggle Camp	98.0%	24.0%	48.1%
Madrone Cove BAC*	111.3%	50.0%	69.9%
Frenchy Point BAC	85.0%	22.5%	42.9%
Garden Point BAC	100.0%	56.0%	70.4%
Shoreline Camping	111.3%	40.8%	63.8%

* BAC = Boat Access Campground

All figures are based upon observation Data (RIM) collected by Tahoe National Forest 1990, 1991 except Madrone Cove, Frenchy Point, Garden Point, and Shoreline Camping based upon the number of camping permits reported sold by the Emerald Cove Marina.

Number of observation days = 20.

Column 2 figures are estimates based upon 10 Primary Day Observations.

Length of 1991 Survey Season

33 Primary Days (Holidays and Weekends)

68 Secondary Days (Weekdays)

101 Days Total (May 25 - Sept 2)

Table B.3
Campground People At One Time (PAOT)

	Primary Day PAOT	Secondary Day PAOT	Season PAOT
Schoolhouse Campground	413	183	256
Dark Day Campground	86	11	35
Hornswoggle Group Camp	147	36	71
Madrone Cove BAC*	NA	NA	49
Frenchy Point BAC	NA	NA	24
Garden Point BAC	NA	NA	99
Shoreline Camping	NA	NA	55

Table B.4
Day Use Facility Occupancy Rates 1991

Day Use Facility	Weekends	Holidays	Weekdays	Season	No. of Weekend days at 95% Capacity
Dark Day Picnic Area	43%	79%	14%	26%	4
Dark Day Boat Ramp	109%	139%	54%	74%	25
Sunset Vista Point	1%	1%	2%	1%	0
Cottage Creek Boat Ramp	200%	318%	70%	120%	26

All figures in Table B.4 are based upon observation data collected by Yuba County Water Agency and Tahoe National Forest 1991.

Number of observation days = 36.

Column 2 figures are estimates based upon 17 Weekend Day Observations.

Length of 1991 Survey Season

36 Weekend Days

7 Holidays

93 Weekdays

136 Days Total (May 25 - Oct 7)

Table B.5
Day Use Facility Occupied Units 1991

		Avg VAOT*	Avg TAOT**	Total Occupied Units	Peak VAOT	Peak TAOT
Cottage Creek Boat Ramp						
Capacity 112 Units	Weekday	47	32	79	196	120
	Weekend	139	85	224	339	203
	Holiday	218	138	356	334	203
Dark Day Boat Ramp						
Capacity 164 Units	Weekday	51	38	89	179	127
	Weekend	104	75	179	211	139
	Holiday	140	88	228	200	125
Sunset Vista Point						
Capacity 20 Units	Weekday	0	0	0	1	0
	Weekend	0	0	0	2	0
	Holiday	1	0	1	4	0
Dark Day Picnic Area						
Capacity 14 Units	Weekday	2	0	2	15	0
	Weekend	6	2	8	26	2
	Holiday	11	0	11	28	1

* VAOT = Vehicles At One Time
** TAOT = Trailers At One Time

Table B.6
Day Use Facility People At One Time (PAOT)

	Weekend PAOT	Holiday PAOT	Weekday PAOT	Season PAOT
Cottage Creek Boat Ramp	403	632	136	232
Dark Day Boat Ramp	302	406	148	202
Dark Day Picnic Area	24	48	8	14
Sunset Vista Point	0	4	0	<1

Table B.7
Estimated Average Reservoir Use, Boats At One Time (BAOT)

Boat Type and Origin	Weekend	Holiday	Weekday	Seasonal
Houseboats*	19	27	10	13
Launched from Cottage Creek**	85	138	32	51
Launched from Dark Day**	75	88	38	50
TOTAL	179	253	80	114

*Based on the average use rate for houseboats by day type.
**Information taken from Trailers At One Time in boat launch parking areas.

USER GROUP DATA

Table B.8
Persons Per Group

Day & Overnight	Avg	6
	Max	45
	Std Dev	<1
	Median	4 (99% C.I.=4,5)

Table B.9
Persons Per Day Group

	Avg	4
	Max	22
	Std Dev	3
	Median	3 (99% C.I.=2,4)

Table B.10
Length of Stay

Day Groups	Avg	5 Hours
	Max	13 Hours
	Std Dev	<1 Hour
	Median	7 Hours (99% C.I.=6.5,7)

Table B.11
Persons Per Overnight Group

	Avg	7
	Max	45
	Std Dev	<1
	Median	6 (99% C.I.=6,6)

Table B.12
Length of Stay

Overnight Groups	Avg	3 Days
	Max	16 Days
	Std Dev	2.5 Days

Table B.13
Persons Per Group
Distribution (Percent)
Day & Overnight

Groups	1-3 Persons	35%
	4-6 Persons	38%
	7-12 Persons	20%
	13< Persons	7%

Table B.14
Persons Per Group
Distribution (Percent)

Day Groups	1-3 Persons	55%
	4-6 Persons	30%
	7-12 Persons	11%
	13< Persons	4%

Table B.15
Persons Per Group
Distribution (Percent)

Overnight Groups	1-3 Persons	15%
	4-6 Persons	42%
	7-12 Persons	29%
	13-18 Persons	6%
	19< Persons	6%

Table B.16
Persons Per Vehicle

Avg	2.9

Table B.17
Vehicles Per Group

Avg	2
Max	12
Std Dev	1
Median	2

Table B.18
Boats Per Group
(All types except Houseboats)

Avg	1.4
Max	N/A
Std Dev	N/A
Median	1

Table B.19
Motorboats Per Group

Avg	1.2
Median	1

HOUSEBOAT GROUP SIZE AND EQUIPMENT DATA

Table B.20
Houseboat Use
Percent of Houseboats Out on Reservoir
36 total

Weekend	53%
Holiday	77%
Weekday	28%
Season	37%

Table B.21
Houseboat People At One Time

Weekend	152
Holiday	222
Weekday	80
Season	106

Table B.22
Number of Persons Per Houseboat Group

Avg	8
Max	19
Std Dev	<1
Median	8 (99% C.I.=6,9)

Table B.23
Number of Vehicles
Per Houseboat Group

Avg	3
Max	8
Std Dev	1
Median	2 (99%. C.I.=2,3)

Table B.24
Number of Motorboats
Per Houseboat Group

Avg	1
Max	4
Std.Dev	<1
Median	1 (99% C.I.=1,2)

BOAT TYPE AND HORSEPOWER DATA

Table B.25
Boat Types Used (Percent)
On Reservoir (Calculated from the sum of all boat types)

Motorboats	78.8%
Hand Propelled	3.1%
Houseboats	8.1%
Sailboats	1.1%
Jet skis	7.2%
Patio boats	1.6%

Table B.26
Boat Types Used (Percent)
By Group (Calculated from the total number of groups surveyed)
(i.e. 92% of all groups surveyed brought at least 1 motorboat)

Motorboats	92%
Hand Propelled	3%
Houseboats	12%
Sailboats	2%
Jet skis	7%
Patio boats	2%

Table B.27
Motorboat Horsepower
Distribution (Percent)
(Calculated from the total number of motorboats)

1 - 35 hp	21%
36 - 65 hp	6%
66 - 175 hp	40%
176 - 275 hp	19%
> 276 hp	14%

ACTIVITY DATA

Table B.28
Primary Activity
(Percent of total groups participating in each activity)

Water Skiing	37%
Boat Fishing	33%
Pleasure Boating	13%
Sunbathing/Relaxing	6%
All Other Activities	5%
Swimming/Wading	4%

Table B.29
Primary Activity By Day Type
(Percent of total groups participating in each activity)

Weekday

Boat Fishing	46%
Water Skiing	25%
Pleasure Boating	14%
Sunbathing/Relaxing	6%
Swimming/Wading	4%
Jet Skiing	2%
Shore Fishing	1%
Wind Surfing	1%
All Other Activities	1%

Weekend

Water Skiing	42%
Boat Fishing	28%
Pleasure Boating	11%
Sunbathing/Relaxing	5%
Jet Skiing	4%
Swimming/Wading	4%
Shore Fishing	3%
All Other Activities	2%
Hiking/Walking	1%

Holiday

Water Skiing	43%
Boat Fishing	22%
Pleasure Boating	13%

Sunbathing/Relaxing	8%
Swimming/Wading	7%
All Other Activities	4%
Shore Fishing	1%
Nature Study	1%
Jet Skiing	1%
Wind Surfing	1%

Table B.30
Activity Participants
Number of people participating in each activity
Based on 582 surveys Received

Activity	Number of Participants
1. Sunbathing/Relaxing	2065
2. Swimming/Wading	1991
3. Pleasure Boating	1929
4. Picnicking	1714
5. Water Skiing	1600
6. Boat Fishing	606
7. Hiking	520
8. Jet Skiing	306
9. Shore Fishing	276
10. Nature Study	242
11. Other Activities	153
12. Wind Surfing	28
Total participants recorded	11,430

RESERVOIR SHORELINE USE

Table B.31
Reservoir Shoreline Use by Zone and Day Type
(See map, Figure 1.2)

Weekday			Weekend		
Zone	Frequency	Percent	Zone	Frequency	Percent
A	3	2.1%	A	2	1.3%
B	0	0.0%	B	1	1.0%
C	10	7.1%	C	5	3.2%
D	21	14.9%	D	15	9.6%
E	13	9.2%	E	9	5.8%
F	3	2.1%	F	0	0.0%
G	12	8.5%	G	20	12.8%
H	16	11.3%	H	20	12.8%
I	11	7.8%	I	10	6.4%
J	15	10.6%	J	18	11.5%
K	5	3.5%	K	14	9.0%
L	5	3.5%	L	9	5.8%
M	5	3.5%	M	8	5.1%
N	4	2.8%	N	7	4.5%
O	18	12.8%	O	17	10.9%
P	0	0.0%	P	1	1.0%

Table B.31 (Continued)
Reservoir Shoreline Use by Zone and Day Type
Continued

Holiday

Zone	Frequency	Percent
A	0	0.0%
B	0	0.0%
C	5	5.2%
D	8	8.3%
E	6	6.3%
F	1	1.0%
G	21	21.9%
H	17	17.7%
I	5	5.2%
J	10	10.4%
K	6	6.3%
L	5	5.2%
M	2	2.1%
N	2	2.1%
O	8	8.3%
P	0	0.0%

Based on a question asking users to indicate spots they used along the reservoir shoreline.

RECREATION USER PREFERENCES AND SATISFACTION

PREFERRED DISTANCE BETWEEN GROUPS

Table B.32
Preferred Minimum Distance Between Visitor Groups
by Primary Shoreline Activity

Swimming/Wading (n=65)

Maximum	1000 yds
Minimum	10 yds
Average	188 yds
Std Deviation	28 yds
Median	100 yds (99% C.I.=50,100)

Sunbathing /Relaxing (n=168)

Maximum	1000 yds
Minimum	5 yds
Average	169 yds
Std Deviation	18 yds
Median	100 yds (99% C.I.=50,100)

Table B.33
Preferred Minimum Distance Between Shoreline Groups
Overnight vs. Day Use

Day Users

Maximum	300 yds
Minimum	10 yds
Average	63 yds
Std Deviation	8 yds
Median	50 yds

Overnight Users

Maximum	1000 yds
Minimum	15 yds
Average	137 yds
Std Deviation	25 yds
Median	100 yds

Based on 142 shoreline interviews

Table B.34
Preferred Minimum Distance Between Boats on Reservoir
By Primary Boating Activity

Water Skiing

Maximum	10,000 yds
Minimum	5 yds
Average	286 yds
Std Deviation	53 yds
Median	100 yds (99% C.I. = 100,100)

Boat Fishing

Maximum	1000 yds
Minimum	17 yds
Average	310 yds
Std Deviation	65 yds
Median	100 yds (99% C.I. = 50,500)

Pleasure Boating

Maximum	1000 yds
Minimum	5 yds
Average	159 yds
Std Deviation	62 yds
Median	50 yds (99% C.I. = 17,100)

Average Preferred Minimum Distance For All Boating Activities 278 yds.

Table B.35
Importance and Satisfaction of Recreation Elements

Ranking	Element	Importance*	Satisfaction*
1	Water Quality	98.5%	81.4%
2	Safety	98.0%	66.0%
3	Cleanliness	97.0%	72.0%
4	Boat Launch	96.4%	67.2%
5	Natural Setting	96.3%	92.5%
6	Number of Boats	93.7%	78.0%
7	Security	87.0%	68.0%
8	Comfort Stations	86.5%	45.0%
9	Camping Experience	81.9%	59.8%
10	Camping Areas	79.0%	56.0%
11	Picnic Areas	63.0%	41.0%
12	Hiking Opportunities	39.0%	30.0%

* Percentage of visitors rating the element as important or very important, satisfactory or extremely satisfactory.

USER SENSE OF CROWDEDNESS

Table B.36
Percent of Users Reporting Moderate to Extreme Crowding While Persuing Their Primary Activity
By Activity and Day Type

Day Type	Boat Fishing	Water Skiing	Pleasure Boating
Weekend	47%	39%	38%
Holiday	60%	62%	44%
Weekday	28%	44%	33%

Table B.37
User Sense of Crowding on Reservoir
User sense of crowding throughout the zone where the respondent is located.

	On Water Surface	On Shoreline
Not at All	63%	67%
Slightly	13%	21%
Moderately	17%	12%
Extremely	7%	0

Table B.38
User Sense of Crowdedness at Shoreline Sites
Percent of Groups Surveyed
User sense of crowding in immediate shoreline vicinity.

	Weekend	Holiday
Not at All Crowded	87%	89%
Slightly Crowded	9%	11%
Moderately Crowded	4%	0
Extremely Crowded	0	0

Table B.39
Zones Reported as Crowded
By Day Type
Based on a question asking users to indicate reservoir zones where they felt crowded. Includes both shoreline and water surface areas of the reservoir. (See map, Figure 1.2.)

Weekdays (n=146)

Zone	Frequency	Percent
A	12	8.2%
B	7	4.8%
C	7	4.8%
D	20	13.7%
E	18	12.3%
G	11	7.5%
H	14	9.6%
I	9	6.2%
J	5	3.1%
K	3	2.1%
L	6	4.1%
M	10	6.8%
N	9	6.2%
O	12	8.2%
P	0	0.0%
Q	0	0.0%

Weekends (n=319)

Zone	Frequency	Percent
A	23	7.2%
B	14	4.4%
C	16	5.0%
D	47	14.7%
E	44	13.8%
G	16	5.0%
H	20	6.3%
I	29	9.1%
J	10	3.1%
K	15	4.7%
L	18	5.6%
M	19	6.0%
N	14	4.4%
O	20	6.3%
P	4	1.3%
Q	2	0.6%

Holidays (n=208)

Zone	Frequency	Percent
A	20	9.6%
B	5	2.4%
C	9	4.3%
D	29	13.9%
E	27	13.0%
F	5	2.4%
G	16	7.7%
H	16	7.7%
I	16	7.7%
J	5	2.4%
K	6	2.9%
L	9	4.3%
M	16	7.7%
N	10	4.8%
O	17	8.2%
P	1	0.5%
Q	1	0.5%

USER CONFLICTS AND COMMENTS

Table B.40
Visitor Conflicts with Other Groups
Frequency Distribution By Primary Activity

Water Skiing (66 Reported Conflicts)

Conflict	Frequency	Percentage
Crowding/Parking problems at boat launch	12	18%
Unsafe boating- General	10	15%
Non-compliance in no-wake zones	9	14%
Miscellaneous	9	14%
Boaters driving too close while skiing	6	9%
Shoreline site crowding conflicts	6	9%
Loud late nigh.. groups	6	9%
Theft Concerns	4	6%
Careless Jetskiers	4	6%

Boat Fishing (44 Reported Conflicts)

Conflict	Frequency	Percentage
Waterskiers/Ski boats driving too close	24	55%
Other anglers too close/snagged lines	4	9%
Speeding in no wake zones	4	9%
Miscellaneous	3	7%
Crowding/Parking problems at boat launch	3	7%
Careless jet skiers	2	4%
Loud jet boats	2	4%
Loud late night groups	2	4%

Pleasure Boating (16 Reported Conflicts)

Conflict	Frequency	Percentage
Unsafe boating- General	3	18%
Crowding/Parking problems at boat launch	3	18%
Non-compliance in no-wake zones	3	18%
Boaters driving too close	2	12%
Problems with Emerald Cove employees	2	12%
Miscellaneous	2	12%
Shoreline Site Crowding	1	6%

Swimming and Relaxing (13 Reported Conflicts)

Conflict	Frequency	Percentage
Shoreline site crowding	2	15%
Loud late night groups	2	15%
Boaters driving too close	2	15%
Non-compliance in no-wake zones	2	15%
Miscellaneous	2	15%
Unsafe boat operation	1	8%
Very rough water	1	8%
Crowding at boat launch	1	8%

Table B.41
Questionnaire Comments
Frequency Distribution By Topic

Unsafe Boat Operation

Conflict	Frequency	Percentage
Boats passing too close to other boats	44	5%
Problems with jetskis	32	3%
Non-compliance in no-wake zones	30	3%
Careless boating practices	24	2%
Boats speeding along shoreline	19	2%
Others boating under the influence of alcohol	10	1%
More patrolling needed on reservoir	42	4%
Total	201	20%

Water Quality

Conflict	Frequency	Percentage
Debris on reservoir	82	9%
Water Quality Good	41	4%
Water Quality Declining or Poor	14	2%
Enjoy high water level	31	3%
Total	168	18%

Restrooms

Conflict	Frequency	Percentage
Restrooms unpleasant	135	14%
Need more restrooms	13	1%
Total	148	15%

General - Management

Conflict	Frequency	Percentage
Limit number of houseboats on reservoir	25	3%
Limit number of boats on reservoir	15	2%
Do not develop new boat ramp/parking	6	1%
Continue free boat launch	40	4%
Need more beach areas	19	2%
Garbage facilities insufficient	19	2%
Create separate fishing and skiing areas	12	1%
Total	136	15%

Boat Ramp - Parking

Conflict	Frequency	Percentage
Parking too crowded	55	6%
Illegal parking on boat ramps	46	5%
Boat loading congestion at ramps	33	3%
Total	134	14%

Concessionnaire

Conflict	Frequency	Percentage
Concessionnaire employees (positive)	7	1%
Concessionnaire employees (negative)	17	2%
Concessionnaire advertising drawing crowds	32	3%
Concessionnaire prices too high	10	1%
Total	66	7%
Total Comments:	**950**	**100%**

Table B.42
Questionnaire Comments
Frequency Distribution

Restrooms unpleasant	135
Debris on reservoir	82
Parking too crowded	55
Water quality	55
Positive Comments: 41	
Negative Comments: 14	
Illegal parking on boat ramps	46
Boats passing too close to other boats	44
More patrolling needed on reservoir	42
Continue free boat launch	40
Too much late night noise	35
Boat loading congestion at ramps	33
Conflicts with jetskis	32
Concessionnaire advertising drawing crowds	32
Enjoy high water level	31
Non-compliance problem in no-wake zones	30
More patrolling needed in campgrounds	28
Need to limit number of houseboats	25
Concessionnaire employees	24
Positive comments: 7	
Negative comments: 17	
Careless boating practices	24
Need more beach areas	19
Garbage facilities insufficient	19
Boats speeding along shoreline	19
Excessive noise from jetboats	17
Theft concerns	17
Need to limit number of boats on reservoir	15
Create separate fishing and skiing areas	12
Need more restrooms	13
Concessionnaire prices too high	10
Drinking and boating problems	10
Do not develop new boat ramp/parking	6
Total Comments:	950

Attachment

STATISTICAL METHODS USED IN APPENDIX B

Background

The Building & Land Services (B&LS) Department estimates the capacity of PG&E recreational facilities by conducting personal interviews and mail surveys of facility users. Users are asked several questions including size of group, length of stay, whether they are using a houseboat, and minimum desired distance for chosen activity.

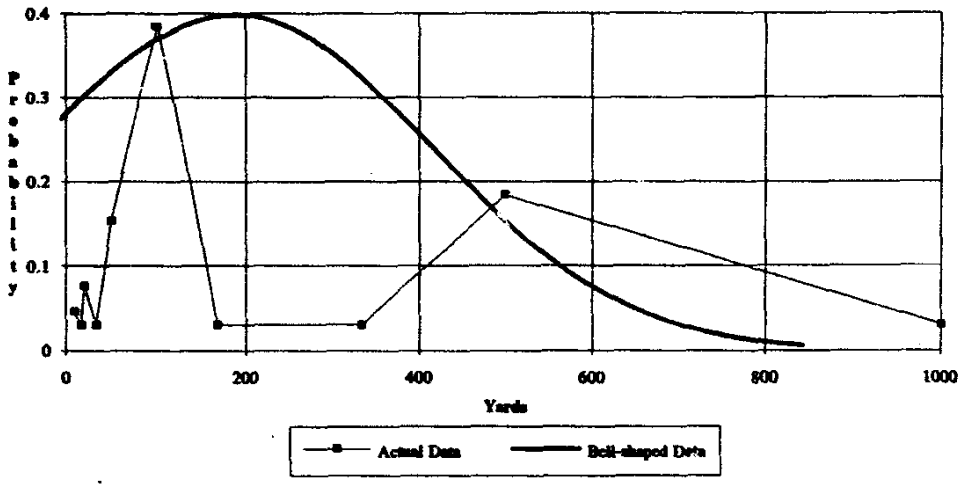
B&LS requested that the Economics & Forecasting Department provide methods and calculations for the survey data. This paper summarizes the results and provides documentation of the methods.

Results

After examining the distribution of survey data, we concluded that the values collected did not follow a bell-shaped curve (also known as normally distributed).

For example, survey data collected on the desired minimum distance between swimmers are shown in the graph compared to a hypothetical bell-shaped distribution. One obvious conclusion from comparing the actual data and the hypothetical distribution is that the actual data are not bell-shaped.

Minimum Distance for Swimming



When using averages (arithmetic mean) and standard deviations, the data are assumed to be normally distributed. Since the actual data were not normally distributed, we suggest the use of the median instead of the mean. The appendixes contain the medians and corresponding confidence intervals. The averages and their confidence intervals are also shown for sake of comparison. Displayed below is a list of the appendixes:

Appendix	Survey Item
1	Number of people per group
2	Length of stay in hours
3	Minimum desired shoreline distance between groups in yards
4	Values per houseboat group
5	Minimum distance in yards between groups for various activities

For example, the median number of vehicles per houseboat group may be found in Appendix 4. The sample median is two vehicles per houseboat group and the corresponding 95% confidence interval for the median is [2 , 3]. With 95% confidence, the true median for vehicles per houseboat group may be found in the interval [2 , 3].

For comparison purposes, averages and their confidence intervals are also included in the appendixes. Respondents to the survey averaged 2.7 vehicles per houseboat group. We are 95% confident that the true population mean lies in the interval [2.4 , 3.0].

The remainder of the paper covers an overview of basic statistical concepts. Five subjects are covered:

Median and Percentiles

Average and Mean

Tests of Normality

Standard Error and Confidence Intervals for the Sample Median

Standard Error and Confidence Intervals for the Sample Mean

Median and Percentiles

The median occurs where half of the population exceed the median value and half of the population are less than the median. The median is also called the 50th percentile. In skewed distributions, the sample median is a better estimate of the central location than the sample mean.

To estimate the sample median from a sample of size n, first arrange the observations in ascending order from lowest to highest. The ranked observations are called the 1st, 2nd, 3rd, ... , nth order statistics. If the sample size n is odd, the sample median is the middle order statistic or the (n+1)/2 order statistic. If the sample size is even, then the sample median is the average of the middle two order statistics, the average of n/2 and (n+2)/2 order statistics.

The pth percentile occurs where p% of the rates are less than the (n+1)*p/100 order statistic and (100-p)% of the rates are greater.

Average and Mean

The average or arithmetic mean is the most common measure of central location of a distribution. The mean is merely the sum of all values divided by the total number of values. The population mean is given by the mathematical symbol

$$\mu = \sum_{i=1}^{N} x_i / N$$

N is the population size and x_i are the individual values from the population.

The population mean is estimated by the sample mean given by the mathematical symbol

$$\bar{x} = \sum_{i=1}^{n} x_i / n$$

n is the sample size and x_i are the individual values from the sample.

Tests of Normality

When the actual data are bell-shaped or normally distributed, the mean and the median work equally well as measures of central location. However, when the actual data are not normally distributed, the median works best as the measure of central location.

Depending on the sample size, one of two tests may be used to determine whether the actual data are normally distributed. If the sample size is less than or equal to 2000, the Shapiro-Wilk statistic[1] is computed. If the sample size is greater than 2000, the Kolmogorov test[2] is computed. These tests fit the actual data against a hypothetical normal distribution. In all cases, the collected survey data did not fit a normal distribution.

Standard Error and Confidence Intervals for the Sample Median

The standard error of the sample median estimates the precision of using the sample median to estimate the population median. The sample median provides a measure of central location. The standard error of the sample median provides a measure of variability. Some authors use the terms standard error and standard deviation interchangeably. The standard deviation is the actual measure of variability. The standard error is an estimate of the standard deviation.

The confidence interval provides a probability statement about the population median using the sample median and standard error. With a predetermined level of confidence, the confidence interval covers the true population median. Interpretation of the confidence interval varies from author to author. Generally, a 99% confidence interval implies that if 100 samples of size n were drawn from the population, 99 of them

would cover the true population median. The more confidence is desired, the wider the confidence interval. A 99% confidence interval is wider than a 95% confidence interval. This confidence level should be determined ahead of the analysis.

The standard error and sample size determine the width of the confidence interval. As the sample size increases, the size of the standard error decreases and the width of the confidence interval decreases.

A confidence interval for the median rate may be constructed using the following technique.[3,4]

(1) For a sample of size n, find the sample median using the procedures outlined in the previous section. The cumulative distribution of the data may be found by dividing the rank by the sample size n.

(2) $p_{.50}$ is the proportion of the sample below the sample 50th percentile. Compute the standard error of $p_{.50}$ as $se_{.50} = \sqrt{0.5^2/(n-1)}$.

(3) A 99% confidence interval for $p_{.50}$ may be computed as

$$p_{lower} = 0.5 - (2.576*se_{.50} + 1/(2*n))$$

$$p_{upper} = 0.5 + (2.576*se_{.50} + 1/(2*n))$$

With a confidence level of 99%, the population 50th percentile lies in the interval $\left[p_{lower} , p_{upper} \right]$.

(4) From the cumulative distribution found in (1), find the values corresponding to p_{lower} and p_{upper}. Interpolate if necessary. These values are the upper and lower bounds for the sample median rate.

Standard Error and Confidence Intervals for the Sample Mean

A (1 - α) % confidence interval for sample mean is given by

$$p_{lower} = \bar{x} - Z_\alpha * S_{\bar{x}}$$

$$p_{upper} = \bar{x} + Z_\alpha * S_{\bar{x}}$$

where $\bar{x} = \sum_{i=1}^{n} x_i / n$,

x_i = individual values of survey item,

n = sample size,

Z_α = 1.645 for a 90% confidence interval (α = .10)

= 1.960 for a 95% confidence interval (α = .05)

= 2.576 for a 99% confidence interval (α = .01),

$S_{\bar{x}}$ = $S_x / \sqrt{n}$ known as the standard error of the mean,

$$S_x^2 = \frac{\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}{n-1}$$

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