KILARC-COW CREEK PROJECT
FERC No. 606

Recreational Resources Report

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Executive Summary

Pacific Gas and Electric Company (PG&E), the Licensee for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project), is applying to the Federal Energy Regulatory Commission (FERC) to surrender the license for the Project. As part of the surrender process, PG&E proposes to decommission and remove the Project works as described in this Preliminary Proposed Decommissioning Plan (Plan PG&E 2007). The resource studies conducted under the Notice of Intent to relicense the Project collected information on a wide variety of resources areas in the vicinity of the Project. The studies were conduced pursuant to study plans circulated to State and federal resource agencies and the public as part of the First Stage Consultation package. Although the studies were originally planned to support relicensing of the Project, the data collected provides much of the information needed to support the development of the Surrender Application.

The recreation resources study provides information on regional recreation opportunities and project specific information that can be used in the decommissioning planning process. The objectives for the regional recreation study are as follows:

- Describe existing recreation opportunities within the Project Region.
- Identify regional recreation resources that offer opportunities similar in nature to those offered at the Project Area.
- Identify existing and future recreation demand for recreation activities within the Project Region.

REGIONAL RECREATION OPPORTUNITIES

Regarding regional recreation supply, the Project area's region is known for the recreation opportunities similar to those offered at Kilarc Forebay. The Kilarc-Cow Creek Project Area is surrounded by millions of acres of public lands that offer both developed and dispersed recreation opportunities. The region offers a wide assortment of water-based recreation opportunities such as fishing, swimming, and boating. Recreation attractions include Shasta Lake, Whiskeytown Lake, Mount Shasta, Whiskeytown–Shasta–Trinity National Recreation Area, Lassen National Forest, Castle Crags State Park, Pacific Crest Trail, McArthur-Burney Falls Memorial State Park, as well as a variety of streams, like Hat Creek and the Sacramento River. There are comparable recreation opportunities available to visitors that recreate at Kilarc Forebay at nearby reservoirs operated by PG&E. These PG&E maintained recreational opportunities include: McCumber Reservoir, North Battle Creek Reservoir, Lake Grace, and Lake Nora.

Nearby hiking areas include Trinity Divide Country, Pacific Crest Trail, Lassen Volcanic National Park, and the Thousand Lakes Wilderness Area. An estimated two to three million visitors each year come to Shasta County to enjoy these recreation resources.

Regarding regional recreation demand, northern California's growth has been concentrated in the metropolitan areas such as the San Francisco Bay Area. While the majority of the population is concentrated in urbanized counties, many Californians are moving inland away from high-cost, high-density coastal counties (California State Parks, 2002). Shasta County has shared this inland growth pattern with an 11.0 percent growth rate from 1990 to 2000 (ERS, 2003).

Recreation use within the region is extremely high due to the large number of recreation resources, unique natural setting, and proximity to urban areas. The demand on recreation resources throughout northern California, and within the Project's regional study area, will continue to increase over the next 10 to 20 years.

KILARC COW CREEK PROJECT

Recreation Features of the Project

The recreation study focused on the sections of the Project including the Kilarc forebay and powerhouse. The study area is located approximately 30 miles east of the city of Redding. The forebay is situated on a flat plateau at the west end of a spur from Miller Mountain. The powerhouse is situated on a terrace above the streambed of Old Cow Creek, and is located approximately 1.0 mile northwest of the forebay. The creek flows to the southwest and is an important tributary to Cow Creek, which in turn is a tributary to the Sacramento River. The Kilarc Main Canal diverts water in the upstream reaches of the Old Cow Creek and conveys water to the forebay. The water then enters the powerhouse penstock where it drops approximately 1,192 feet then to the powerhouse and then reenters Old Cow Creek. The forebay regulates water into the penstock and the powerhouse. An overflow spillway is available to return water to the creek.

The study area provides a wide variety of outdoor recreation opportunities, including sightseeing, hiking, fishing, scenic and wildlife viewing, and nature appreciation. Camping, boating, and swimming are prohibited to maintain water quality in the forebay. The recreation site is developed by the Licensee as a day-use picnic area that offers fishing in the forebay. There are two picnic areas on the northeastern side of the forebay. Access to the two vault toilets adjacent to the picnic areas is afforded from both the picnic areas via a short trail. A footbridge is located across the entrance of Kilarc Main Canal to provide public access around the forebay shoreline.

Visitor Use and Questionnaire Results

Information on visitor use and visitor preferences for management of the study area was collected during between May and September in 2003 on 22 randomly selected days. Recreation questionnaires were administered and visitor use counts conducted at various sites at the forebay and the surrounding area. The highest peak number of people-at-one-time (PAOT) of 25 was observed at Kilarc Forebay Shoreline with an average of 5.4 percent PAOT. The highest peak number of vehicles-at-one-time (VAOT) was 9 at Kilarc Forebay Picnic Area. The overall peak number of persons observed in the study area was 25 on May 25, 2003 (Memorial Day weekend) with an average of 2.8 persons observed at one time, and the overall peak number of vehicles observed in the study area was 9 on September 1, 2003 (Labor Day weekend) with an average of 3.2 vehicles observed at one time. Approximately 77.9 percent of total visitors to the study area

were observed at the Kilarc Forebay Shoreline. Approximately 13.3 percent of total visitors were observed at the Kilarc Forebay Picnic Area. For the entire sampling season, the highest number of vehicles in the study area (130) was observed at Kilarc Forebay Picnic Area, followed by Kilarc Inlet Canal Area with 35.

Bank fishing was the most popular activity, with approximately 62 percent of the total number of visitors engaged in this activity. The second highest number was for general recreation with 93 visitors and approximately 19.6 percent of total visitors engaged in this activity. Picnicking and sunning had approximately 12 and 6 percent participation respectively. Although no survey respondents indicated that they boated, 2 visitors (0.4 percent participation) were recorded for general boating. Although survey respondents indicated that they arrived before 12 PM and left the study area by 5 PM, researcher observations revealed the majority of all observed activity occurred in the morning. The forebay picnic area's table use was evenly split between morning and afternoon use. The group picnic area's use was predominantly in the afternoon.

Out of 135 questionnaires distributed, 45 responses were received with a 33.3 percent response rate. Several items in the questionnaire asked visitors to provide information on the characteristics of their trip to the Kilarc Forebay. The average visitor group size was 3, and the average duration of the trip to the study area was 4.3 hours. The most common recreation activities with the highest number of participants reported were fishing, sightseeing, picnicking, wildlife viewing, and hiking. During their stay in the study area, the visitors reported low levels of crowding. Visitors who completed questionnaires were asked to rate their experience concerning different attributes such as facilities at the site, trails, fishing quality, etc. Overall, the average rating of the attributes was 3.6 (where a "4" meant "not a problem") which indicated that across all the items respondents rated, they were very satisfied with facilities, management, and recreation opportunities within the study area.

In terms of adjustments to management practices or visitor preferences for additional recreation-related facilities, respondents indicated the following information. There were 5 responses received each indicating the need for camping, litter management, signs, and better restrooms, and 3 responses each for better trails, fishing, safety, and other issues. Two responses were received each indicating the need for swimming and drinking water facilities, and better road conditions. Based on the peak use observations, as well as picnic table occupancy, it appears that there is currently not a need to increase parking, develop management strategies for crowding, or install more picnic tables within the study area.

Section 1: Introduction

Pacific Gas and Electric Company (PG&E), the Licensee for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project), has been ordered by Federal Energy Regulatory Commission (FERC) to prepare a Surrender Application for the Project. As part of the surrender process, PG&E proposes to decommission as described in this Preliminary Proposed Decommissioning Plan (Plan PG&E 2007).

PG&E initially sought a new license for the Project and began to relicense the Project in 2002 as required by FERC for the continued operation of the Project. A Notice of Intent (NOI) to relicense the Project was filed in 2002. PG&E prepared the First Stage Consultation Package, and conducted the resource studies necessary to support relicensing. PG&E and was in the process of compiling the study reports when it made the decision to decommission the Project instead of seeking a new license.

The resource studies conducted collected information on a wide variety of resources areas in the vicinity of the Project. Although the studies were originally planned to support relicensing of the Project, the data collected provides much of the information needed to support the development of the Surrender Application. At the time PG&E decided to decommission the Project, the resource studies were in various stages of completion. Completed reports were prepared for aquatic resources, wildlife resources, botanical resources, recreation resources and California red-legged frogs. The other resource studies conducted for relicensing contain information pertinent to decommissioning, however, that information has not been analyzed. These include cultural, historical and geomorphology studies. This information will be further evaluated and presented in the Surrender Application.

This resource report summarizes the pertinent information collected on recreation resource.

1.1 OBJECTIVES

The objectives for the regional recreation study are as follows:

- Describe existing recreation opportunities within the Project Region.
- Identify regional recreation resources that offer opportunities similar in nature to those offered at the Project Area.
- Identify existing and future recreation demand for recreation activities within the Project Region.
- Identify any additional recreation facilities that are currently being planned for the area.

1.2 STUDY AREA

The Study Area includes regional recreation opportunities including recreation facilities operated by the United States Forest Service (USFS), National Park Service (NPS), Bureau of Land Management (BLM), California State Forest, California State Parks Department, Shasta County,

City of Redding and City of Anderson, the Licensee, and private entities. This assessment focuses on recreation opportunities that are open to the public and are of a similar nature to those offered in the immediate vicinity of the Project Area (fishing and picnicking). The following discussion is organized by federal, state, county, Redding and Anderson, and Licensee facilities. This second half of this report presents information on Project Area recreation use and survey information produced by visitors within the Project area. The Project Area (described in detail below) including the forebay and powerhouse is in Shasta County in Northern California. The Project Area is located approximately 30 miles east of the city of Redding.

1.3 METHODOLOGY

Information on regional recreation opportunities was collected from Internet web sites, recreation guidebooks, the Shasta–Trinity Land and Resource Management Plan, maps, and Shasta County General Plan.

Section 2: Regional Recreation Resources: Results and Discussion

Most of the regional resources discussed below are displayed in Figure 1.

2.1 FEDERAL RECREATION RESOURCES

2.1.1 Shasta–Trinity National Forest

The Shasta–Trinity National Forest is the largest national forest in California, covering nearly 1,123,000 acres. Approximately 1,300 acres are allocated to developed recreation areas within the Forest. These include 81 campgrounds with 1,355 camping units; 20 picnic areas with 127 units; 14 boat launch areas; 3 day-use swim areas; and 20 resorts and marinas operated by concessionaires. Campgrounds are located throughout the forest, and a few primitive campsites are available at higher elevations (USFS, 1989).

Dispersed recreation activities take place on paved and unpaved roads, backcountry areas, rivers, lakes, streams, and wilderness areas. There are dozens of lakes that are accessible via short hikes. The California Department of Fish and Game stocks the lakes with fingerlings. The Stienstra (1999) list of 24 lakes in the Shasta-Trinity National Forest that provide good fishing include the following:

- Bluff Lake
- Bull Lake
- Cabin Meadow Lake
- Caldwell Lakes
- Cliff Lake
- Crater Lakes
- Deadfall Lakes
- Devil's Lake
- Dobkins Lake
- Echo Lake/the Seven Lakes Basin
- Gray Rock Lake
- Grouse Lake
- Horseshoe Lake
- Little Castle lake
- Lost Lake
- Masterson Meadow Lake
- Mumbo Lake
- Rock Fence Lake
- Scott Lake
- Slide Lake
- Terrace Lake
- Timber Lake
- Twin Lakes
- West Park Lakes

Other recreation lakes and rivers within Shasta–Trinity National Forest that offer fishing and picnicking opportunities are presented in Table 1.

2.1.2 Whiskeytown–Shasta–Trinity National Recreation Area

The Whiskeytown–Shasta–Trinity National Recreation Area (NRA) is 254,500 acres in size, 212,000 acres of which are managed by the Shasta–Trinity National Forest. The Forest Service manages Shasta, Trinity and Lewiston Lakes. The National Park Service manages Whiskeytown Lake (USFS, 2003).

The two largest lakes within the NRA are Shasta and Trinity. Shasta Lake is the largest man-made reservoir in California. When full, the lake has 370 miles of shoreline and offers 29,500 surface acres of water. Trinity Lake, when full, has 145 miles of shoreline and offers 17,000 surface acres of water. Recreation activities offered in the Shasta and Trinity units of the NRA are discussed under the Shasta–Trinity National Forest (USFS, 2003).

2.1.3 Lassen Volcanic National Park

Surrounded by Lassen National Forest, Lassen Volcanic National Park is 106,372 acres in size. The focal point of the park is Lassen Peak a 10,457-foot plug dome volcano. Lassen Volcanic National Wilderness Area is also located within the park, east of Lassen Peak. Ten campgrounds and seven picnic areas are located within the park (Lassen Volcanic National Park, May 5, 2003). The park also contains approximately 150 miles of hiking trails, including 17 miles of the Pacific Crest Trail. Recreation activities provided in the park include backpacking, hiking, horseback riding, lake/stream fishing, swimming, and non-power boating. The park also has one downhill ski area.

2.1.4 Lassen National Forest

The Lassen National Forest is 1,200,000 acres in size. It includes several lakes formed by ancient volcanic activity and Caribou and Thousand Lakes Wilderness areas. Recreation activities include camping, hiking, backpacking, horseback riding, hunting, fishing, swimming, boating and winter sports (USFS, 2003). Lakes and rivers within Lassen National Forest that offer recreation opportunities are presented in Table 2.

2.1.5 Bureau of Land Management

The Bureau of Land Management, Redding Office is responsible for the administration of approximately 250,000 acres of land in northern California. The BLM manages developed recreation facilities within the regional study area including Jelly Ferry, which is a day-use facility along the Sacramento River that offers fishing opportunities. Recreation along the BLM-managed stretch of the Sacramento River from Jelly's Ferry south to Turtle Creek includes hiking, picnicking, target shooting, camping, and wildlife watching. Payne's Creek recreation site provides primitive camping, fishing, hiking, horseback riding, and wildlife watching. The Douglas City Campground has campsites and a group picnic area. Located along the Trinity River, the Junction City Campground provides campsites and picnic tables and is located near Junction City. Steelbridge Primitive Campground provides camping sites, picnic tables, and river

access (website, Redding Field Office BLM, 2003). The Chappie-Shasta Staging Area offers fishing access and picnicking. Hiking, bicycling, off-highway vehicle (OHV), and equestrian trails are available. The Hog Lake Plateau offers seasonal, primitive camping and hunting opportunities, as well as hiking, bicycling, and equestrian trails. The Reading Island Recreation Site offers group camping, swimming, nature viewing, boating, and trails including hiking and equestrian (Shasta Cascade 2000).

2.2 STATE RECREATION FACILITIES

2.2.1 LaTour Demonstration State Forest

The La Tour State Forest (9,033 acres in size) is located in Shasta County south of Burney and east of Redding at the edge of the Lassen National Forest. The area is popular with hikers, bicyclists, snowmobilers, equestrian groups, hunters, and anglers. Four primitive camp sites and several picnic areas are available (website, LaTour Demonstration State Forest, 2003).

2.2.2 McArthur-Burney Fall Memorial State Park

The park is within the Cascade Range and Modoc Plateau, with 910 acres of forestland and 5 miles of streamside and lake shoreline, including a portion of Lake Britton. The park's centerpiece is the 129-foot Burney Falls. There are 5 miles of hiking trails and the Pacific Crest Trail passes through the park. The park has one picnic area and two campgrounds. Recreation activities provided include fishing, hiking, horseback riding, swimming, boating and wildlife viewing (website, McArthur-Burney Falls Memorial State Park, 2003).

2.2.3 Castle Crags State Park

The Castle Crags State Park offers swimming and fishing in the Sacramento River, hiking in the backcountry, and a view of Mount Shasta. The park is 4,350 acres in size and features 28 miles of hiking trails, including a 2.6 mile access trail to Castle Crags Wilderness, part of the Shasta–Trinity National Forest. The Pacific Crest Trail also passes through the park. The park also provides four campgrounds, one picnic area, and a vista area to view the Castle Crags rock formations (website, Castle Crags State Park, 2003).

2.2.4 Ahjumawi Lava Springs State Park

"Where the waters come together…" is a translation of the word Ahjumawi. The waters which come together are Big Lake, Tule River, Ja-She Creek, Lava Creek and Fall River. Together they form one of the largest fresh water spring systems in the country. Preserved within the Park are lava flows broken by great faults and deep cracks, lava tubes and craters. Freshwater springs flowing from the lava are prominent along Big Lake's shoreline. Facilities provided at the park include boat in campsites and picnic areas. Recreation activities include biking, camping, fishing, wildlife viewing, and hiking (website, Ahjumawi Lava Springs State Park, 2003).

2.2.5 Shasta State Historic Park

Shasta State Historic Park is located 6 miles west of Redding and consists of historic buildings from the California gold rush era. The park also provides picnic tables (website, Shasta State Historic Park, 2003).

2.3 SHASTA COUNTY PARKS

2.3.1 French Gulch Park

French Gulch is a registered historic district. Founded by French miners in 1849, the town was relocated and was one of California's richest gold producing areas. One of the state's first stamp mills was operated at the nearby Franklin Mine. Located on Clear Creek approximately 12-miles west of Redding along State Route 299, facilities at the site include fishing access, three picnic tables for day use, and a gravel parking area that accommodates approximately 10 vehicles (pers. comm. D. Little, Shasta County 2003).

2.3.2 Hat Creek Park

Located approximately 75-miles east of Redding on State Route 299, Hat Creek is known for its first-class fishing opportunities. The site provides fishing access and includes five picnic tables for day use, restrooms, and a paved parking area that accommodates approximately 20 vehicles (Ibid.).

2.3.3 Balls Ferry Boat Ramp

Located approximately 20-miles south of Redding, the site has Sacramento River access via a paved boat launch ramp, vehicle parking for 30 car/ trailer combinations, six picnic tables, and restrooms.

2.4 CITY RECREATION FACILITIES

2.4.1 Caldwell/Lake Redding Park

The Caldwell/Lake Redding Park houses the Redding Museum and the Carter House Natural Science Museum and is located on the banks of the Sacramento River. These parks feature a public swimming pool, playgrounds, picnic areas, softball and soccer fields, horseshoe pits, and nine-hole public golf course (website, Redding, Shasta County, California, USA, 2003).

2.4.2 Sacramento River Trail

The Sacramento River Trail provides access to the river for fishing and day-use. The trial is 8 feet wide and designed for pedestrians and bicycles (Website, Activities at the Blues by the River Festival, 2003).

2.4.3 Anderson River Park

Anderson River Park includes soccer fields, tennis courts, picnic area, horseshoe and bocce-ball pits, fishing ponds, a playground, and walking trails. The park is also home to the Shasta Wildlife Refuge, which shelters and rehabilitates wounded wildlife from the area (website, Anderson Parks & Recreation Department).

2.5 LICENSEE RECREATION FACILITIES AT OTHER HYDROELECTRIC PROJECTS

The Licensee offers campgrounds, picnic areas, and fishing access within the regional study area that are in close proximity to the project area. Licensee recreation sites include the areas described below and summarized in Table 3. Baum Lake provides a car-top boat launch for boating, waterfowl hunting, and fishing opportunities. Baum Lake also offers scenic and wildlife watching opportunities. Big Lake provides a boat ramp for boating, fishing and water skiing opportunities. When in season, waterfowl hunting also occurs at this site. Big Lake also offers scenic and wildlife watching opportunities. Cassel campground is located east of Burney and provides fishing and camping opportunities (27 units). Hawkins Landing is west of Burney at Iron Canyon Reservoir Spillway. Camping sites (10) and a boat ramp are provided. Recreation opportunities include camping, fishing, swimming, and boating.

Dusty Campground is located on the north shore of Lake Britton. The site has seven camp units and offers recreation opportunities including swimming and fishing. Jamo Point provides a boat launch, a fishing access area, and opportunities for waterskiing and boating activities on Lake Britton. Recreation opportunities include fishing, boating, water skiing, and swimming. At the north shore of Lake Britton, the Licensee has 30 camping sites. Recreation opportunities include fishing, swimming, scenic and wildlife watching, boating, and water skiing. Also located on the north shore of Lake Britton is the Pines picnic area that provides 10 tables for day-use recreation, nearby fishing and swimming opportunities. Kilarc Project area facilities are discussed in the Project recreation section (Licensee Recreation Areas: Pit River, 2003).

At Lake Grace and Lake Nora the Licensee provides picnic areas (10 each). McCumber Reservoir provides seven camping units and five walk-in campsites. There is a car-top boat launch nearby affording boating and fishing opportunities. North Battle Creek has ten campsites and five walk-in camp units. Recreation activities include fishing, swimming, and non-motorized boating (Pacific Gas and Electric Form 80, Project No. 1121).

2.6 EXISTING REGIONAL DEMAND AND PROJECTED USE

A rapidly growing population has resulted in increased demand for outdoor recreation throughout the State of California. California's population grew by 14 percent during the 1990s, reaching 34 million. This pace of growth is projected to continue, with California's population reaching 45 million by 2020 (California State Parks, 2002).

Most of California's growth has been concentrated in the metropolitan areas of Los Angeles, San Diego, and the San Francisco Bay Area. While the majority of the population is concentrated in urbanized counties, many Californians are moving inland away from high-cost, high-density

coastal counties (California State Parks, 2002). Shasta County has shared this inland growth pattern with an 11.0 percent growth rate from 1990 to 2000 (ERS, 2003).

Recreation use within the region is high due to the large number of recreation resources, the unique natural setting, and its proximity to urban areas. Interstate 5, which passes through Shasta County, is the primary north/south transportation corridor for the West Coast. Table 4 lists the most recent visitor use data for the federal and state recreation areas within the study area.

Outdoor recreation opportunities are considered important to the quality of life by most Californians (California State Parks, 2002). The top 15 activities in order of participation (i.e., more people walk than visit museums) for Californians in 1997 were:

- Walking (recreation)
- Visiting museums, historic sites
- Use of open grass or turf areas (soccer fields, etc)
- Driving for pleasure
- Beach activities
- Visiting zoos and arboretums
- Picnicking in developed sites
- Trail hiking
- Swimming in lakes, rivers, ocean
- Attending outdoor sports/events
- General nature and wildlife study
- Attending outdoor sports/events
- Camping in developed sites
- Swimming in outdoor pools
- Bicycling (on paved surfaces)

In a June 2002 Central and Northern California Outdoor Recreation Market Analysis, conducted by the USDA Forest Service, U.S. BLM, and the Department of Recreation and Leisure Studies at San Francisco State University, Central and Northern California residents who were interviewed indicated that the primary reasons for visiting federal outdoor recreation land in Central and Northern California are camping, day hiking, motor boating/water skiing, and driving/sightseeing (USDA, 2002). Respondents also indicated that 90 percent of those who participated in outdoor recreation in the last year reported that they planned to visit federal lands again in the next year.

It appears that the demand on recreation resources throughout California, and within the Project's regional study area, will continue to increase over the next 10 to 20 years.

The USFS collects information pertaining to the type, quantity, quality, and location of recreation use on each forest through their National Visitor Use Monitoring Project. The Shasta–Trinity National Forest, in the year 2002, had approximately 2.2 million people (visitors). The top five recreation activities of observed and surveyed visitors were relaxing, viewing natural features, viewing wildlife, fishing, and hiking/walking (USFS, 2003).

Recreation use on the Lassen National Forest for the year 2000 was 656,038 visitors. During their visit to Lassen National Forest, the top five recreation activities of the observed and surveyed visitors were viewing scenery and wildlife, general relaxation, hiking/walking, fishing, and developed camping. The top primary activities were: fishing, other non-motorized vehicle activities such as swimming, games and sports, developed camping, and driving for pleasure (USFS, 2001).

The NPS estimates that visitation to Whiskeytown–Shasta–Trinity National Recreation Area will experience a 2 percent increase in visitor use over the next 5 to 10 years. Visitor use will continue to be heavily concentrated in the lake areas containing developed facilities and amenities (boat launches, etc.) (NPS, ND).

In 2002, approximately 775,000 visitors came to Whiskeytown–Shasta–Trinity National Recreation Area. The primary recreation activities that they participated in were camping, hiking, swimming, boating, horseback riding, fishing, and wildlife viewing (NPS, 2003).

2.7 SUMMARY AND CONCLUSIONS

The Project Region is known for the recreation opportunities similar to those offered at Kilarc Forebay. The Kilarc-Cow Creek Project Area is surrounded by millions of acres of public lands that offer both developed and dispersed recreation opportunities. The region offers a wide assortment of water-based recreation opportunities such as fishing, swimming, and boating. Recreation attractions include Shasta Lake, Whiskeytown Lake, Mount Shasta, Whiskeytown–Shasta–Trinity National Recreation Area, Lassen National Forest, Castle Crags State Park, Pacific Crest Trail, McArthur-Burney Falls Memorial State Park, as well as a variety of streams, like Hat Creek and the Sacramento River. Nearby hiking areas include Trinity Divide Country, Pacific Crest Trail, Lassen Park, and the Thousand Lakes Wilderness Area. An estimated two to three million visitors each year come to Shasta County to enjoy these recreation resources.

Regarding regional recreation demand, most of California's growth has been concentrated in the metropolitan areas such as the San Francisco Bay Area. While the majority of the population is concentrated in urbanized counties, many Californians are moving inland away from high-cost, high-density coastal counties (California State Parks, 2002). Shasta County has shared this inland growth pattern with an 11.0 percent growth rate from 1990 to 2000 (ERS, 2003).

Recreation use within the region is extremely high due to the large number of recreation resources, unique natural setting, and proximity to urban areas. The demand on recreation resources throughout California, and within the Project's regional study area, will continue to increase over the next 10 to 20 years.

Section 3: Project Area-Specific Recreation Resources

3.1 INTRODUCTION

This report describes existing recreation use and visitor survey information from the Kilarc Forebay and Kilarc Powerhouse. The forebay and powerhouse are located approximately 30 miles east of Redding, California. Within the Project Area, the forebay and powerhouse are the only two recreation areas where activity is promoted and facilities occur (Appendix A). Other lands within the Project Area are private lands and not open to public access, not easily accessible (e.g., no road access, heavily forested, steep hillsides), nor do they have facilities (e.g., restrooms, picnic tables) or attributes that draw recreation users (e.g., accessible creeks or reservoirs). The forebay and powerhouse are on lands open to the public, easily accessible, have facilities, and have attributes recreation users seek (Appendix A). This report constitutes two specific recreation studies: Questionnaire Study and Existing Use Study, presented here in a combined format.

3.2 QUESTIONNAIRE STUDY

The objective of this study was to document information related to recreation visitors' preferences for management of the study area. Study methodologies are described below. The questionnaire instrument was designed to obtain information related to characteristics of recreation use of the study area. Specific recreation topics addressed by the study included types of preferred recreation activities, origin of visitors, perceived levels of crowding, length of stay, visitor satisfaction and factors that influence satisfaction, and preferences for facility improvements.

3.3 EXISTING USE STUDY

The objective of this study was to document levels and types of recreation activities within the study area. Study methodologies are described below. Standard measures of use were obtained from field observations, including People-At-One-Time (PAOT), and Vehicles-At-One-Time (VAOT), where applicable.

3.4 OBJECTIVES

The objective of this study was to document recreation use and visitor preference information within the study area.

3.5 STUDY AREA

This study was concerned with sections of the Project including the forebay and powerhouse in Shasta County in Northern California. The study area is located approximately 30 miles east of the city of Redding. The powerhouse is located approximately 1.0 mile northwest of the forebay (Figure 2).

The forebay is situated on a flat plateau at the west end of a spur from Miller Mountain. The powerhouse is situated on a terrace above the streambed of Old Cow Creek. The creek flows to the southwest and is an important tributary to Cow Creek, which in turn is a tributary to the Sacramento River. The Kilarc Main Canal diverts water in the upstream reaches of the Old Cow Creek and conveys water to the forebay. The water then enters the powerhouse penstock then to the powerhouse and then reenters Old Cow Creek.

The study area provides a wide variety of outdoor recreation opportunities, including sightseeing, hiking, fishing, scenic and wildlife viewing, and nature appreciation. Camping, boating, and swimming are prohibited to maintain water quality in the forebay. The recreation site is developed by the Licensee as a day-use picnic area that offers fishing in the forebay. There are picnic areas on the northeastern side of the forebay. Access to the two vault toilets adjacent to the picnic areas is afforded from the picnic area via a short trail. A footbridge is located across the entrance of Kilarc Main Canal to provide public access around the forebay shoreline.

Recreation surveys were administered at various sites at the forebay and the surrounding area. These sites included the following.

- KF1 - Kilarc Forebay Picnic Area;
- KF2 - Kilarc Forebay Group Picnic Area;
- KF3 - Kilarc Forebay Overflow Picnic Area;
- KF4 - Kilarc Forebay Water Surface;
- KF5 - Kilarc Forebay Shoreline;
- KF6 - Kilarc Forebay Dispersed Sites;
- KF7 - Kilarc Forebay Powerhouse Area; and
- KF8 - Kilarc Forebay Inlet Canal Area.

3.5.1 Methodology

Methodology for this report consisted of three components: site visits, data collection, and data analysis. While the powerhouse and forebay are separate recreation areas (distinct areas within the study area), questionnaire or existing use data was grouped because there were so few data collected at the powerhouse.

The study includes the following approach:

- Observations of the recreation activities were made from the shoreline;

- Surveys were limited to the forebay and powerhouse, which are the only recreation areas accessible to the public in the study area; and
- The study area was within the FERC Project boundary.

3.5.2 Site Visits

Initially, eight recreation sites were identified in the forebay and near the powerhouse. (Site KF6, initially identified as dispersed sites potential along study area roads, was eventually disregarded due to no recreation use observed at the site). Site visits were scheduled in roughly two time phases, morning and afternoon, on days listed in Table 5. After consulting with the Licensee, a random, stratified sample schedule was developed. It consisted of morning intervals occurring from approximately 10 AM to 12 PM, and afternoon intervals occurring from approximately 2 PM to 4 PM. This timeframe captured morning and afternoon anglers as well as picnickers, the Project area's main recreation users. The field schedule was designed to capture use activity on holidays, random weekend days and weekdays throughout the field season.

As shown in Table 5, the schedule included 22 randomly selected days between May and September with 44 individual visits to the sites in the study area. The survey period commenced on the first major holiday weekend (Memorial Day) of the peak visitor season and ended after Labor Day (September 1, 2003). To ensure that high use periods were counted, the schedule accommodated a consecutive two-day field effort for three federal holidays within the time frame: Memorial Day, Independence Day, and Labor Day. One random weekday in June was missed and made up in August. The Memorial Day Monday (actual holiday) was not sampled due to logistical complications, and was made up in July. The Saturday and Sunday directly prior to Memorial Day was sampled (5/24 and 5/25).

Researchers used two forms for data collection through distribution and observation. Sites KF3 (overflow picnic area) and KF6 (dispersed sites) at the forebay provided no use observations or visitor surveys. Data were collected at six of the eight initially identified sites. As mentioned above, KF6 (forebay dispersed sites) was found to have no use, and KF4 had no use due to no body contact or watercraft restrictions. Thus, KF6 and KF4 were not sampled once fieldwork was underway. Regarding weather and forebay pool levels, in general the sample dates were sunny and warm. Across sample dates, pool levels in the forebay fluctuated in height very little. Kilarc Forebay has a gross and usable storage capacity of 30 acre feet at an elevation of 3,782 feet and a surface area of 5 acres. During normal operations the water surface elevation varies by approximately 3 feet.

3.5.3 Data Collection

Surveys were conducted at six sites at the forebay and powerhouse. The surveys consisted of a one-page questionnaire to study various recreation activities and one count form to record the use levels in the study area. There was a log form to record the total number of questionnaires distributed at the sites.

A multi-part visitor questionnaire was developed to collect information about recreation users, their activities, and the types of experience they desired within the study area (Appendix B). Visitors were asked their opinions of the management of recreation facilities in the study area.

Researchers handed the questionnaires to visitors at recreation sites. In the event no visitors were observed, questionnaires were left on vehicles in parking areas with instructions for to be completed and mailed to ENTRIX in self-addressed, stamped envelopes.

Researchers used a log form (Appendix C) to record the number of questionnaires distributed. This was used to calculate the survey response rate.

3.5.3.1 Existing Use Study

The count form was used to collect information on the amount of recreation use in the study area based on 6 sites (Appendix D). Researchers used the count forms to record the number of people observed, the time of the day, date, and number of recreation activities observed. These forms were used in conjunction with the questionnaires during the same site visit schedule shown in Table 5. The recreation activities in which the visitors participated were noted, such as picnicking, general recreation, swimming, sunning, and fishing. The number and type of vehicles were recorded during both the times, morning and afternoon, during the site visit. During the morning count, vehicles were identified and noted on the form. Later, during the afternoon count, in addition to listing new vehicles, it was noted if the same vehicles were identified from the morning count. This was determined by striking through the recorded type of vehicle that was observed in the morning and not in the afternoon. Thus, the data collected at each site included the observed number of people, their respective recreation activities, and the number of vehicles.

3.5.4 Data Analysis

Data from the questionnaire and count form were analyzed for the number of visitors, their experience in the study area, type of recreation activities in which the majority of visitors engaged, and the number of the vehicles parked near the sites. Frequencies were calculated for each question using a spreadsheet program. Zip codes provided on surveys were associated to visitor county of origin using a look up finder (Melissa Data, 2003). This provided researchers with the origins of Project area visitors.

3.6 RESULTS AND DISCUSSION

The following sections present key study findings. Questionnaire data are presented followed by a discussion on existing use.

3.6.1 Questionnaire Study

Out of 135 distributed questionnaires, 45 responses were received, with an overall response rate of 33.3 percent. This returns rate should be understood in the context of a contemporary survey effort. A larger-scale 1992 statewide survey for the California Department of Parks and Recreation obtained a mailback response rate of 40 percent, typical of other, similar, state-wide efforts. The state survey utilized several measures intended to maximize responses, where this study did not. Thus, a 33.3 percent response rate is by comparison good. The following sections discuss the results in the order that the items appear in the questionnaire form. The percentage of surveys distributed at each of the six sites within the Project area is shown in Table 6.

The majority of questionnaires were distributed to visitors at the shoreline and picnic area at the forebay (sites KF5 and KF1) with 52.6 percent and 37 percent of total distributed questionnaires, respectively. Each of the other sites had questionnaire distribution of lower than 10 percent.

3.6.1.1 Group Size

Visitors were asked, "How many people are in your group today, including yourself?" The average group size of visitors in the study area was 3, based on 45 responses. The highest group size was 8 and the smallest group size was 1.

3.6.1.2 Length of Stay

Visitors were asked their arrival and departure time at the site. Forty-two visitors responded to this question. The average duration for which visitors stayed in the study area was 4.3 hours. The duration of visitors varied from minimum of 1 hour to a maximum of 12 hours. Regarding arrival times, of the 45 who answered the survey question about arrival time, seven visitors stated they arrived before 8 AM. Six indicated they arrived before 10 AM; 12 before 12 PM; 11 before 2 PM; eight before 5 PM; and one after 5 PM. Regarding departure times, of the 45 who answered the survey question about departure time, three visitors stated they arrived before 12 PM. Thirteen indicated they arrived before 2 PM; 17 before 5 PM; eight before 8 PM; and four after 8 PM. According to survey responses, the greatest number of visitors arrived before 12 PM and left the study area by 5 PM (see Activity Observations below and Table 15).

3.6.1.3 Activity Observations

Visitors were asked to indicate the activities that they participated in on the trip to the study area. The questionnaire included a list of recreation activities (multiple options) from which to choose. The overall activity participation is shown in Table 7.

The most common activities (top five) reported by visitors were fishing, sightseeing, picnicking, wildlife viewing, hiking, and 'other activities' that were not included in the list provided in the questionnaire. Fishing was the most popular recreation activity indicated by 93.3 percent of respondents, followed by sightseeing which had 35.6 percent of participation. Picnicking and wildlife viewing had the same level of participation with 31.1 percent. The participation for hiking was 12.2 percent, while the rest of activities had less than 10 percent of participation. "Other activities," with 8.9 percent of participation, included nature photography, scouting, all terrain vehicle riding, and hunting.

Visitors were then asked to indicate their primary activity. Primary activity is the one in which the respondent indicated they did most while in the study area. The activity was either one that they mentioned previously or a new activity. Table 8 shows the percent of participation and primary ranked activities indicated by visitors.

There were total of 42 responses to this question. Three visitors did not respond. Fishing was the primary activity with 85.7 percent participation, followed by sightseeing with (7 percent participation). All the other primary activities had less than 5 percent visitor participation. The

large difference between the percent participation in fishing and the other primary activities indicates the high popularity of fishing within the study area.

3.6.1.4 Level of Crowding

Visitors were asked to indicate the level of crowding at the site. Crowding was rated on a 9-point scale where 1 indicated "not at all crowded" and 9 indicated "extremely crowded." Table 9 shows the different levels of crowding indicated by the visitors.

Overall, the majority of visitors to the study area reported low levels of crowding. Approximately 80 percent of the visitors responded that they felt not at all crowded to slightly crowded and approximately 20 percent of the visitors responded that they felt that the site was moderately crowded. No visitors indicated they felt extremely crowded in the study area.

Visitors were asked to indicate the number of groups they saw in the study area during their visit that day. There were 42 responses to this question. Visitors indicated that the average number of groups they observed across the six sites in the study area was 4.8. Visitor length of stay averaged 4.3 hours and respondents indicated they saw an average of 4.8 groups. This suggests that they saw an average of just over one group per hour. Respondents indicated that the number of groups observed on sample dates ranged from zero to 20.

3.6.1.5 Recreation Experiences

Visitors were asked to choose from different things they might or might not have experienced at the forebay (Table 10).

This question was asked to assess the experiences of the visitors at the different sites in the study area. The visitors were given a list of recreation-related items and a rating scale from "a big problem" to "not a problem" for every item. The items that are likely encountered by the visitors and known to be important were selected for the questionnaire. The visitors could indicate how they felt about the issue from the given four ratings: a big problem, a moderate problem, a slight problem, or not a problem. Numerically, the value 1 was assigned to a big problem. Therefore, a value close to 1 was problematic and a value close to 4 was not problematic. If uncertain, "NA" was marked for not applicable. The questionnaire had space to state any "other" additional issues of concern and specific locations of their experience.

The average problem rating ranged from 2.4 for "other issues" to 4 for "trails." "Other issues" included the lack of overnight facilities (need for campgrounds) and signs (at the 3.5 mile route and rattlesnake sign on the footbridge for kids), and presence of litter around the forebay. All the other listed items were rated higher than 3.5, indicating visitors did not rate most items as having a problem. The overall average problem rating was 3.6 and items mentioned by survey respondents are discussed below.

Visitors were asked if they had any additional information to share. The responses also included issues or concerns of respondents. There were 11 responses that were positive, stating that the study area was beautiful and that those visitors enjoyed the study area.

A value close to 1 was problematic, and a value close to 4 was not problematic.

Some respondents stated a need for additional facilities or improvement in existing facilities. They are categorized in Table 11.

There were 5 responses received each for the need of camping, litter management, signs, and better restrooms, and 3 responses each for better trail, fishing, safety, and other issues. Two responses were received each for need of swimming and drinking water facilities, and better road conditions. One remark was related to a conflict with other visitors.

One response stated the need for a sign by a 'deep hole in the bank by the headwaters' which was dangerous, which could be counted under the categories of 'safety' and 'signs.'

3.6.1.6 Place of Residence

Visitors were asked to provide their residential zip code in order to determine their origin and distance traveled to the study area. Table 12 lists the county of residence of visitors.

Out of 45 visitors who responded, 38 visitors originated from Shasta County in California, two came from Colusa County and one each came from the counties of Fresno, Riverside, Lassen, and Alameda. One visitor originated in Pasco in Florida. The highest number of visitors lived in close vicinity of the study area, while very few visitors traveled far to the study area.

3.6.1.7 Summary and Conclusions of Questionnaire Study

Out of 135 questionnaires distributed, 45 responses were received with a 33.3 percent response rate. Several items in the questionnaire asked visitors to provide information on the characteristics of their trip to the Kilarc Forebay. In questions related to group size, results indicated that the average group size was three. Out of 42 visitors who responded to the question related to the length of their stay, the average duration of the trip to the study area was 4.3 hours. The most common recreation activities with the highest number of participants reported were fishing, sightseeing, picnicking, wildlife viewing, hiking, and 'other activities.' 'Other activities' included nature photography, all terrain vehicle riding, scouting, and hunting. The most common primary activities reported were fishing and sightseeing. During their stay in the study area, the visitors reported low levels of crowding. The average number of groups that the visitors observed at the site was 4.8. Visitors were asked to rate their experience concerning different attributes such as facilities at the site, trails, fishing quality etc. Overall, the average rating of the attributes was 3.6 (range of 4.0 to 2.4), which indicated that across all the items respondents rated, they were very satisfied with facilities, management, and recreation opportunities within the study area.

When asked for additional information or remarks, the visitors' responses were organized into different categories. There were eleven positive responses stating that the study area was beautiful and the experience was enjoyable. There were five responses received, each stating the need for camping facilities, litter management, signs, and better restrooms, and three responses, each stating the need for better trail, fishing, safety, and other issues. Two responses were received, each stating the need for swimming, drinking water facilities, and better road

conditions. One remark was related to a conflict with other visitors. In terms of place of residence, approximately 84.4 percent of visitors arrived to the study area from Shasta County.

In general, survey respondents indicated that they were well satisfied with recreation attributes in the study area. Respondents indicated that they were, in general, satisfied with facilities and management of the study area. Exceptions to this are displayed in Table 11.

3.6.2 Existing Use Study

This study identifies the types, levels, and distribution of recreation use at various sites in the study area. It uses measures such as people at one time (PAOT) and vehicles at one time (VAOT). Field researchers used the count forms to directly record the number of vehicle parked and number of people engaged in different recreation activities. See Table 13 below.

Table 13 shows a breakdown of PAOT by site. For 22 days, the number of people-at-one-time was recorded at every site in the study area. The highest PAOT was 25 at the forebay shoreline, which had an average usage of 5.4 persons, followed by 7 PAOT at the Kilarc picnic area, which had an average of 2.5 PAOT.

The powerhouse had a peak of 6 and an average of 2.8 PAOT, and had a VAOT peak of 4 and an average of 2. Recreation at the powerhouse is certainly within the study area, but should be treated somewhat differently than the rest of the sites at the forebay due to the differences in recreation activity and use levels at the powerhouse. For example, the powerhouse has on average fewer vehicles per sample and thus the study area's average VAOT would be 3.6 if the powerhouse was not factored in with the forebay sites. The PAOT does not change regardless of factoring in or out the powerhouse. The overall peak number of persons observed at one time in the study area was 25 on Sunday, May 25, 2003 (Memorial Day weekend. In some cases, as displayed in Table 14, there were more cars than there were people.

For example, at the forebay picnic area, this was likely due to the fact that many study area visitors parked at the site but were observed participating in recreation activities elsewhere at the forebay or outside of the study area.

3.6.2.1 Vehicles-At-One-Time (VAOT)

Table 13 shows a breakdown of VAOT by site. For the 22 sample days, the total number of VAOT was recorded at every site in the study area. The highest VAOT was recorded at the forebay picnic area (9) with an average of 6.5 vehicles, followed by 4 VAOT at the group picnic area and the powerhouse area. The overall peak VAOT observed in the study area was 9 on Monday, September 1, 2003 (Memorial Day weekend).

3.6.2.2 Percent of Use

Over the 22 sample days, the percent of visitors and vehicles at each study area site were recorded (Table 14). The highest percent of visitors, almost 78 percent, was recorded at the forebay shoreline. The second highest percent of visitors, 13.3 percent, was recorded at the

forebay picnic area. Fewer visitors were recorded at the group picnic area, the powerhouse, and the inlet canal area with 4 percent, 3.6 percent, and 1.3 percent respectively (Table 14).

The highest percent of vehicle use (61.6) was recorded at the forebay picnic area. This was followed by the inlet canal area with 16.6 percent of percent of all l vehicles observed. The forebay group picnic area had 12.3 percent of the total number recorded. The Kilarc Powerhouse and Forebay Shoreline area had fewer vehicles, with 7.6 percent and 1.9 percent respectively.

The percent of vehicles using various study area sites was observed during morning and afternoon counts and was recorded separately on the count form. This was used to determine the peak use period and the overall turnover rate of vehicles, which allowed researchers to better understand user patterns. Based on researcher knowledge of the forebay and information generated with study observations and surveys, it appears that there are three groups of recreation users who visit the study area. There seems to a group who are probably fishing in the morning (on site by 10 AM) and leaving the site sometime between 12 PM and 2 PM. A second group is there as well at 10 AM who are still there at 2 PM, thus they may be fishing in the morning and picnicking as well. This second group is essentially an all day user group. A third group arrives sometime between 12 PM (when the AM count ended) and 2 PM (when the PM count began) and remained through 4 PM when the PM count finished. This leads researchers to believe that there are essentially three user groups: morning anglers, all day picnickers and anglers who mainly fish and picnic, and afternoon anglers. According to survey responses, from Length of Stay (above), the greatest number of visitors arrived before 12 PM and left the study area by 5 PM (see Activity Observations below and Table 15).

3.6.2.3 Activity Observations

Visitors to the study area were involved in a range of activities, including picnicking, fishing, and other activities. As a part of their visits to the sites, researchers recorded specific activities in which visitors were involved. In cases where specific activities could not be determined, they were categorized as participating in general recreation. For example, a person standing near the shoreline not engaged in any specific activity. Overall counts of visitors involved in different recreation activities are shown in Table 15. The greatest percent of people, 61.7, was recorded for bank fishing. The second greatest percent was for general recreation with 19.6 percent of total visitors. Picnicking and sunning had 12.4 percent and 5.9 percent of study area participant activity, respectively. Although no survey respondents indicated that they boated, 2 visitors were observed participating in general boating, a non-permitted activity at the forebay (Shasta County ordinance).

Although survey respondents indicated that they arrived before 12 PM and left the study area by 5 PM, researcher observations revealed different information. According to researcher observations, the majority of all observed activity occurred in the morning (Table 15).

Regarding picnic table occupancy, the forebay picnic area and the forebay overflow picnic area each have four tables. Ten picnic tables are located at the forebay group picnic area, but no use was observed at this site. Table 16 displays the number and percent of occupied picnic tables at the two sites where use was recorded. The forebay picnic area and group picnic area averaged approximately 27 and 10 percent occupancy, respectively. These use levels suggest that there are an adequate number of picnic tables for the forebay. The forebay picnic area's table use was

evenly split between morning and afternoon use. The group picnic area's use was predominantly in the afternoon.

3.7 SUMMARY AND CONCLUSIONS

The highest peak number of people-at-one-time (PAOT) of 25 was observed at Kilarc Forebay Shoreline with an average of 5.4 percent PAOT. The highest peak number of vehicles-at-one-time (VAOT) was 9 at Kilarc Forebay Picnic Area. The overall peak number of persons observed in the study area was 25 on May 25, 2003 (Memorial Day weekend) with an average of 2.8 persons observed at one time, and the overall peak number of vehicles observed in the study area was 9 on September 1, 2003 (Labor Day weekend) with an average of 3.2 vehicles observed at one time. Approximately 77.9 percent of total visitors to the study area were observed at the Kilarc Forebay Shoreline. Approximately 13.3 percent of total visitors were observed at the Kilarc Forebay Picnic Area. For the entire sampling season, the highest number of vehicles in the study area (130) was observed at Kilarc Forebay Picnic Area, followed by Kilarc Inlet Canal Area with 35.

In terms of activity participation, the highest number of people was recorded for bank fishing with approximately 62 percent of the total number of visitors. The second highest number was for general recreation with 93 visitors and approximately 19.6 percent of total visitors. Picnicking and sunning had approximately 12 and 6 percent participation respectively. Although no survey respondents indicated that they boated, two visitors (0.4 percent participation) were recorded for general boating. Overall, results indicated that fishing had the highest visitor participation. Although survey respondents indicated that they arrived before 12 PM and left the study area by 5 PM, researcher observations revealed different information. According to researcher observations, the majority of all observed activity occurred in the morning (Table 15). The forebay picnic area's table use was evenly split between morning and afternoon use. The group picnic area's use was predominantly in the afternoon.

In terms of adjustments to management practices or visitor preferences for additional recreation-related facilities, respondents indicated the following information. There were five responses received each indicating the need for camping, litter management, signs, and better restrooms, and 3 responses each for better trails, fishing, safety, and other issues. Two responses were received each indicating the need for swimming and drinking water facilities, and better road conditions. Based on PAOT and VAOT peak use observations, as well as picnic table occupancy, it appears that there is currently not a need to increase parking, develop management strategies for crowding, or install more picnic tables within the study area.

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Tables

Table 1 Shasta-Trinity National Forest Recreation Location, Facilities, and Activities

Name of Lake or River	Location	Facilities	Recreation Activities	Approximate Distance from Project Area (miles)
Bear Creek	Near McArthur, in Shasta–Trinity National Forest	None	Fishing	60
Castle Lake	Near Mount Shasta, in Shasta–Trinity National Forest	Camp sites, picnic tables, vault toilets	Camping, fishing, swimming, hiking, picnicking, wind-surfing	110
Clear Creek	West of Redding in Shasta–Trinity National Forest	Primitive camp site	Primitive camping, fishing, swimming	54
Gumboot Lake	Near Mount Shasta, in Shasta–Trinity National Forest	Camp sites, picnic tables, vault toilets	Non-motorized boating, swimming, camping, hiking, picnicking, fishing	110
Iron Canyon Reservoir	Near Big Bend, in Shasta–Trinity National Forest	Two campgrounds, boat ramp	Boating, camping, fishing, swimming	65
Keswick Lake	Near Redding, in Shasta–Trinity National Forest	Boat ramp, day-use picnic area	Boating, fishing, jet skiing, swimming, water skiing, picnicking	50
Lake Britton	Near Fall River Mills, in Shasta–Trinity National Forest	Marina, three boat ramps, campgrounds	Boating camping, fishing, jet skiing, swimming, water skiing, picnicking, windsurfing	75
Lake Siskiyou	Near Mount Shasta, in Shasta–Trinity National Forest	Boat ramp, dock, camp sites, bathrooms with showers, marina	Boating, camping, fishing, swimming, picnicking, windsurfing	95
McCloud River	Near McCloud, in Shasta–Trinity National Forest	Four campgrounds, picnic area	Camping, fishing, swimming, rafting, picnicking	120
Picayune Lake	Near Mount Shasta, in Shasta–Trinity National Forest	None	Day use only, picnicking, swimming, trout fishing	110
Pit River	Northeast of Redding, in Shasta–Trinity National Forest	Camp sites	Camping, fishing, hot springs, swimming	30
Rock Creek	Near Lake Britton, in Shasta–Trinity National Forest	Primitive campground	Fishing, camping	50
Shasta Lake	Near Redding, in Shasta–Trinity National Forest	14 boat ramps, 12 marinas, 12 campgrounds, lakeshore lodging, 400 houseboat rentals	Boating, water skiing, camping, fishing, jet skiing, swimming, windsurfing	50
Tamarack Lake	Near Castella, in Shasta–Trinity National Forest	none	Primitive camping, fishing, swimming	105
Toad Lake	Near Mount Shasta, in Shasta–Trinity National Forest	Camp sites, picnic tables, vault toilets	Camping, fishing, picnicking, hiking, swimming, wind-surfing	120
Trout Creek	Near McCloud, in Shasta–Trinity National Forest	Small campground	Camping, fishing	110
Upper Sacramento River	Near Mount Shasta, upstream of Shasta Lake in Shasta–Trinity National Forest	Camp sites, put-in sites	Camping, fishing, rafting, swimming	105
Whiskeytown Lake	Near Redding, in Shasta–Trinity National Forest	Three boat ramps, three campgrounds, picnic areas	Boating, water skiing, jet skiing, fishing, camping, swimming, wind-surfing, picnicking	50

Source: Stienstra, Tom. California Recreational Lakes and Rivers, April 2000. Stienstra, Tom. California Fishing, January 1999.

Table 2 Lassen National Forest Recreation Location, Facilities, and Activities

Name of Lake or River	Location	Facilities	Recreation Activities	Approximate Distance to Project Area (miles)
Digger Creek	East of Red Bluff, in Lassen National Forest	None	Fishing	40
Manzanita Lake	In Lassen Volcanic National Park	Primitive boat ramp, campground, picnic area	Non-motorized boating, camping, fishing, swimming, picnicking	45
Summit Lake	Near Manzanita Lake, in Lassen Volcanic National Park	Campground	Non-motorized boating, camping, fishing, picnicking, swimming, wind-surfing	50
Butte Lake	South of Burney in Lassen Volcanic National Park	Primitive boat ramp, campground,	Non-motorized boating, camping, fishing, swimming, picnicking, wind-surfing	75
Silver Lake	Near Westwood, in Lassen National Forest	Primitive boat ramp, two campgrounds	Non-motorized boating, camping, fishing, picnicking, swimming	100
Caribou Lake	Near Westwood, in Lassen National Forest	None	Non-motorized boating, fishing, swimming	100
Crater Lake	Near Susanville in Lassen National Forest	Boat ramp, campground	Non-motorized boating, fishing, swimming, camping	90
Eagle Lake	Near Susanville, in Lassen National Forest	Three boat ramps, several campgrounds, marina,	Boating, camping, fishing, jet skiing, swimming, water skiing, windsurfing	120
Thousand Lakes Wilderness	East of Redding, in Lassen National Forest	None	Fishing, hiking, backpacking	60
Caribou Wilderness	In Lassen National Forest	None	Fishing, hiking, backpacking	127

Table 3 Hydroelectric Recreation Facilities within Close Proximity of the Project Area

Name of Hydroelectric Facility	Location	Facilities	Recreation Activities	Approximate Distance from Project Area (miles)
Baum Lake	Northeast of Burney near Cassel	Car top boat launch	Water fowl hunting, fishing, scenic and wildlife viewing	50
Big Lake	Northeast of Burney near McArthur	Boat ramp	Boating, fishing, water skiing, waterfowl hunting, scenic and wildlife viewing	67
Cassel Campground	East of Burney	27 camping units	Camping and fishing	51
Dusty Campground	North shore of Lake Britton	7 camp units	Swimming and fishing	52
Grace Lake	East of Shingletown off Highway 44	10 Picnic sites	Fishing, picnicking, scenic viewing	20
Hawkins Landing	West of Burney at Iron Canyon Reservoir Spillway	10 camping units and a boat ramp	Camping, fishing, swimming, and boating	41
Jamo Point	Lake Britton	Boat launch and a fishing access area	Fishing, boating, water skiing, and swimming.	52
Lake Nora	East of Shingletown off Highway 44	10 Picnic sites	Fishing, picnicking, scenic viewing	20
McCumber Reservoir	East of Redding off Highway 44. Between Shingletown and Viola	7 camping units, 5 walk-in campsites. There is a car-top boat launch nearby	Boating, fishing, camping	31
North Battle Creek	East of Redding, north of Viola	10 campsites and 5 walk-in camp units	Fishing, swimming, and non-motorized boating	47
Pines Picnic Area	North shore of Lake Britton	10 tables for day-use recreation	Nearby fishing and swimming opportunities	52

Table 4 Recent Visitor Use Data

Recreation Area	Annual Visitor Use	Year
Shasta–Trinity National Forest	2,213,351[1]	2002
Lassen National Forest	656,038[2]	2000
Whiskeytown–Shasta–Trinity NRA	775,000[1a]	2002
Lassen Volcanic National Park	387,480[3]	2002
BLM Lands	268,451[4]	2002
LaTour State Forest	6,935[5]	2002
McArthur-Burney Fall Memorial State Park	243,047[6]	2002
Castle Crags State Park	46,603[6]	2002
Ahjumawi Lava Springs State Park	5,597[6]	2002
Shasta State Historic Park	32,687[6]	2002

1. USDA, August 2003
1a. USDA, February 2003
2. USDA, August 2001
3. Website, Lassen Volcanic National Park, 2003
4. Noel, 2003. (5,130 day use days; 1,805 overnight stays)
5. Kuntz, 2003 (visitor days includes day use and overnight stays)
6. Maris, 2003

Table 5 Schedule of Site Visits		
Date	Days of the Week	Distribution of Days Sampled by Days of the Week
05/24/03	Saturday	Monday = 1
05/25/03	Sunday	Tuesday = 1
06/26/03	Thursday	Wednesday = 2
07/04/03	Friday	Thursday = 3
07/05/03	Saturday	Friday = 2
07/06/03	Sunday	Saturday = 7
07/19/03	Saturday	Sunday = 6
07/20/03	Sunday	
07/29/03	Tuesday	
07/30/03	Wednesday	
08/01/03	Saturday	
08/02/03	Sunday	
08/12/03	Wednesday	
08/13/03	Thursday	
08/16/03	Saturday	
08/21/03	Thursday	
08/22/03	Friday	
08/23/03	Saturday	
08/24/03	Sunday	
08/30/03	Saturday	
08/31/03	Sunday	
09/01/03	Monday	
Total Days = 22		Total Visits = 44 (22 Days @ 2 Visits per Day)

Table 6 Questionnaire Distribution by Project Area Sites

Site Number	Name of Site	Number of Questionnaires	Percent Distribution
KF1	Kilarc Forebay Picnic Area	50	37.0
KF2	Kilarc Forebay Group Picnic Area	9	6.7
KF5	Kilarc Forebay Shoreline	71	52.6
KF7	Kilarc Powerhouse Area	1	0.7
KF8	Kilarc Forebay Inlet Canal Area	4	3.0
Total Distributed		135	100.0

Note: only study area sites where surveys were distributed are presented.

Table 7 Overall Activity in the Study Area

Activity	Number of Responses	Percent of Participation	Rank
Fishing	42	93.3	1
Sightseeing	16	35.6	2
Picnicking	14	31.1	3
Wildlife Viewing	14	31.1	3
Hiking	5	12.2	4
Other activity	4	8.9	5
Sunbathing	2	4.4	6
Swimming*	1	2.2	7

Note: Multiple response questions do not total to 100 percent.
*Not a permitted activity.

Table 8 Primary Activity in the Study Area

Activity	Number of Responses	Percent of Participation	Rank
Fishing	36	85.7	1
Sightseeing	3	7.1	2
Picnicking	2	4.8	3
Nature Photography	1	2.4	4
Scouting	1	2.4	4
ATV Riding	1	2.4	4
Hunting	1	2.4	4

Table 9 Levels of Crowding

Crowding Level	Number of Responses	Percent
1	9	20.0
2	13	28.9
3	7	15.6
4	7	15.6
5	3	6.7
6	4	8.9
7	2	4.4
8	0	0
9	0	0

Scale of crowding: 1= Not at all crowded; 3= Slightly crowded; 6= Moderately crowded; 9= Extremely crowded

Table 10 Rating of Recreation-Related Items

Items	Number of Responses	Average Problem Rating
Trails	45	4.0
Management of Recreation at Forebay	43	3.9
Safety Issues	45	3.8
Conflicts between Users	45	3.8
Condition of Facilities at Forebay	43	3.8
Floating Debris on the Forebay	45	3.8
Additional Facilities and Services	43	3.7
Fishing Quality	44	3.7
Litter at Picnic Areas	44	3.5
Other	5	2.4

Note: Multiple response questions do not total to 100 percent.

Table 11 Additional Information Provided by Visitors

Categories	Number of Responses
Positive Responses	11
Need Camping	5
Need Signs or Improve Signs	5*
Improve Restrooms	5
Litter	5
Need or Improve Trails	3
Fishing	3
Safety	3
Other	3*
Need Swimming	2
Road Condition	2
Drinking Water	2
Conflict with Users	1

*Indicates a negative comment, such as party people, bad experience with other visitors, and one complaint stating, 'people take more than their legal limit (fish).'

Table 12 County of Residence

County	Number of Responses	Percent of Sample	Rank
Shasta	38	84.4	1
Colusa	2	4.4	2
Fresno	1	2.2	3
Riverside	1	2.2	3
Lassen	1	2.2	3
Alameda	1	2.2	3
Pasco, Florida	1	2.2	3

Table 13 Summary of Persons and Vehicles Observed

Site	Persons-at-One-Time		Vehicles-at-One-Time	
	Peak	Mean	Peak	Mean
KF1 Kilarc Forebay Picnic Area	7	2.5	9	6.5
KF2 Kilarc Forebay Group Picnic Area	4	1.9	4	2.9
KF5 Kilarc Forebay Shoreline	25	5.4	3	2
KF7 Kilarc Powerhouse Area	6	2.8	4	2
KF8 Kilarc Forebay Inlet Canal Area	3	1.5	3	2.8
Study Area*	25	2.8	9	3.2

Note: only study area sites where use was observed are presented.

*Overall peak numbers noted at any given time in the study area.

PAOT = People-At-One-Time

Table 14 Percent of Persons and Vehicles with Percent Total

Site	Persons	Vehicles
	Percent Total	Percent Total
KF1 Kilarc Forebay Picnic Area	13.3	61.6
KF2 Kilarc Forebay Group Picnic Area	4.0	12.3
KF5 Kilarc Forebay Shoreline	77.9	1.9
KF7 Kilarc Powerhouse Area	3.6	7.6
KF8 Kilarc Forebay Inlet Canal Area	1.3	16.6
Total	100.0	100.0

Table 15 Observed Activity Participation

Activity	Percent of Total Study Area Activity	AM Percent of Activity	PM Percent of Activity	Rank of Overall Activity
Bank fishing	61.7	59.4	40.6	1
General Recreation	19.6	65.6	34.4	2
Picnicking	12.4	64.4	35.6	3
Sunning	5.9	53.6	46.4	4
General Boating*	0.4*	100	0	6

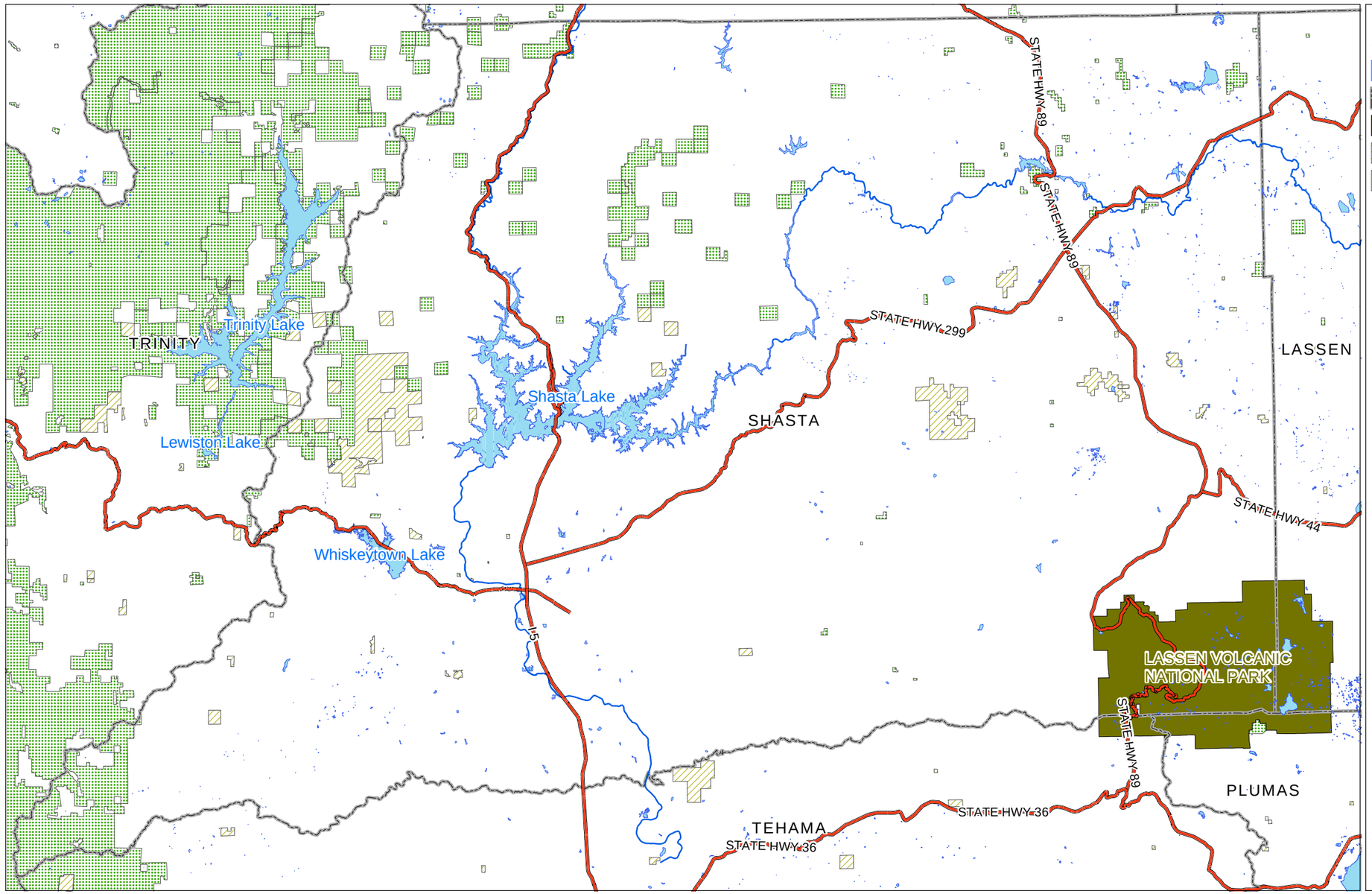
*Not a permitted activity.

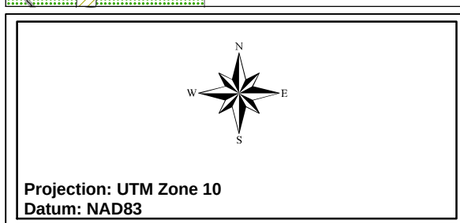
Table 16 Observed Number of Occupied Picnic Tables

Sites	Average Number of Occupied Tables Observed	Percent AM Occupancy	Percent PM Occupancy	Total Number of Available Tables	Percent Occupied
Kilarc Forebay Picnic Area	1.1	50	50	4	26.8
Kilarc Forebay Group Picnic Area	1	33.3	66.6	10	10.0

Note: only study area sites where use was observed are presented.

Figures





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Datum: NAD83

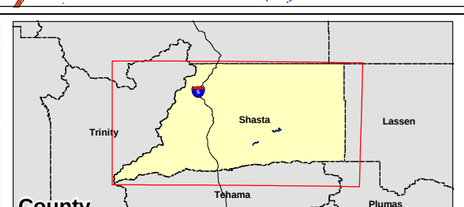

Figure 1
Kilarc-Cow Creek Project
Recreation Regional Map

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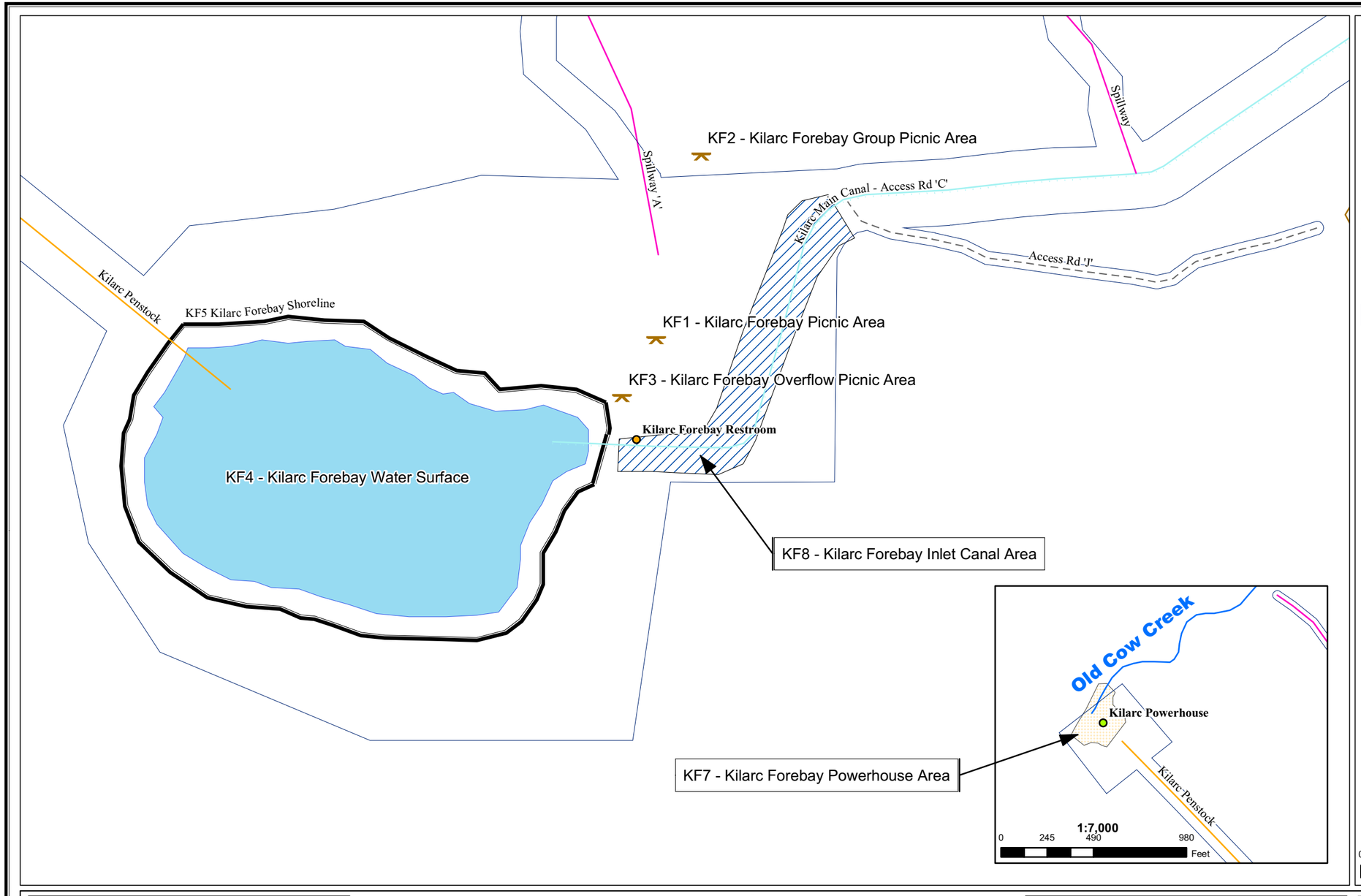

PG&E Facility
PG&E Miscellaneous
Picnic Area
Shoreline
Access Road
Canal
Penstock
Siphon
Spillway
Trail
FERC Boundary

1:2,000

0 75 150 300 450
Feet

N
W E
S

Projection: UTM Zone 10
Datum: NAD83

State

County

Figure 2
Kilarc-Cow Creek Project
Recreation Site Map

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APPENDIX A

Existing Kilarc Forebay Public Recreation Facilities

Photograph A-1. KF #2 DUA only sign.

Photograph A-2. KF #2 boat swim sign 2.

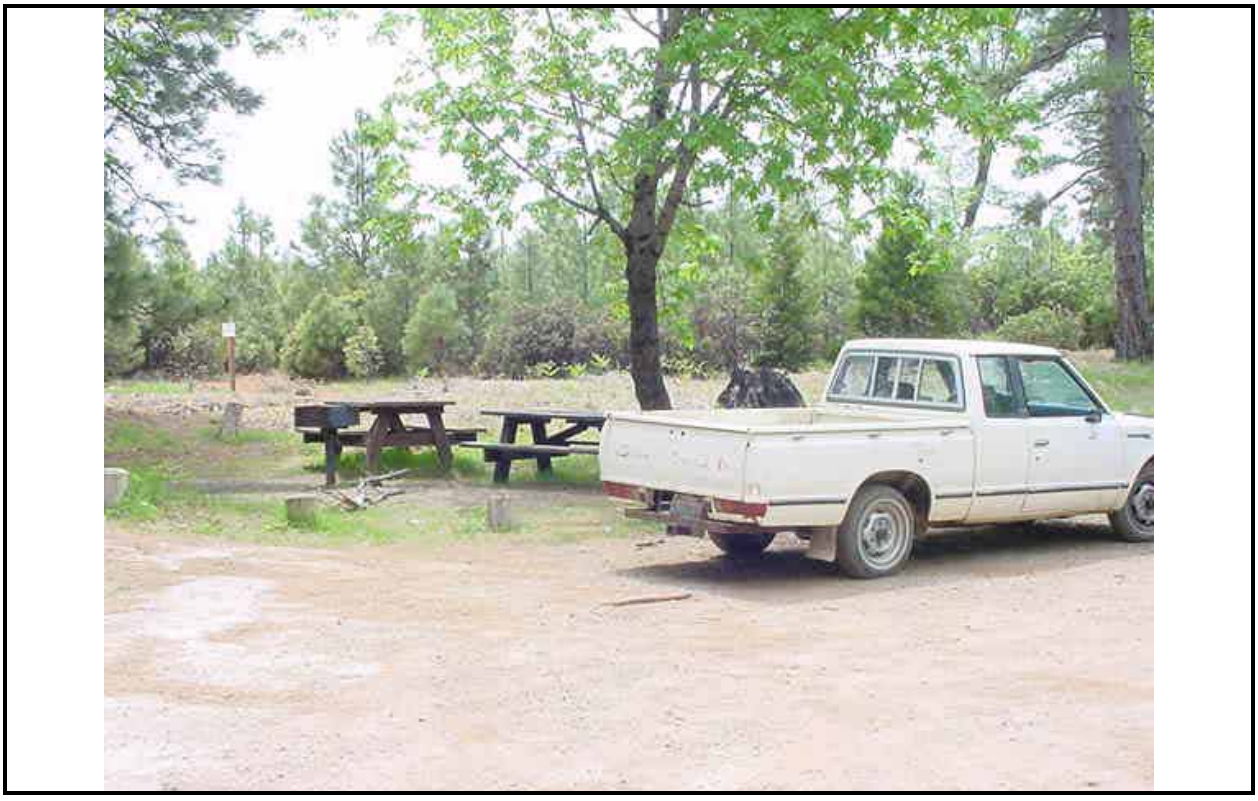
Photograph A-3. Kilarc Forebay sign.

Photograph A-4. KF #2 sign.

Photograph A-5. KF #1 main sign.

Photograph A-6. KF #8 w KF #1 tables.

Photograph A-7. KF #8 inlet canal.



Photograph A-8. KF #1 parking area w tables.

Photograph A-9. KF #1 path to water.jpg.

Photograph A-10. KF #1 signs.jpg.

Photograph A-11. KF #1 parking signs.jpg.

Photograph A-12. KF field staff counting.jpg

Photograph A-13. . KF #2 park area.jpg

Photograph A-14. KF #2 Group site.jpg.

Photograph A-15. KF boating and swimming sign (at KF #2).jpg

Photograph A-16. KF #2 tables.jpg.

Photograph A-17. KF #2 tables 2.jpg.

Photograph A-18. KF #2 tables 3.jpg.

Photograph A-19. KF Group Picnic Area #2 path to water.jpg.

Photograph A-20. KF Group Picnic Area #2 toilets.jpg.

Photograph A-21. KF #1 from water.jpg.

Photograph A-22. KF toilets sign.jpg.

Photograph A-23. Kilarc Picnic Area #1 w surface.jpg.

Photograph A-24. Kilarc Picnic Area #1 BBQ W trash.jpg.

Photograph A-25. Kilarc Forebay Picnic Area #1.jpg.

Photograph A-26. Kilarc Forebay sign2.jpg.

Photograph A-27. Kilarc field staff.jpg.

Photograph A-28. Kilarc Forebay surface.jpg.

Photograph A-29. Kilarc Forebay surveying.jpg.

APPENDIX B

Multi-Part Visitor Questionnaire

Kilarc Forebay
2003 Recreation Visitor Survey

Pacific Gas & Electric Company (PG&E) is interested in hearing about your recreation visit to Kilarc Forebay. Your participation is important to us and will help us to provide quality recreation for everyone. ***Thanks for your participation!***

1. How many people are in your group today, including yourself? _____

2. When did you arrive? _____ AM PM (circle one) ➠ What time did you (do you plan to) leave? _____ AM PM

3. Please indicate which of the following activities you are participating in on this trip (*mark all that apply*):

❑ Picnicking	❑ Hiking
❑ Swimming	❑ Wildlife viewing
❑ Sunbathing	❑ Camping
❑ Fishing	❑ Sightseeing
❑ Boating	❑ Other activity_____

4. Of the activities listed above, which is your **primary** activity on this trip? _____

5. During your visit to the Kilarc Forebay area today, how crowded do you feel (please circle one number)?

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

6. How many other groups have you seen <u>at this area</u> today? _____

7. The following section lists things you might or might not have experienced at Kilarc Forebay. For each item below, indicate how much of a problem you think it is. If you are not sure, mark "not applicable" (*N/A*). If it is a problem, indicate the location if you would like to identify a specific site in your evaluation (*Where*).

	A big problem	A moderate problem	A slight problem	Not a problem	N/A	Where (*specific site on water or land*)
Conflicts between users	❑	❑	❑	❑	❑	
Fishing quality	❑	❑	❑	❑	❑	
Safety issues	❑	❑	❑	❑	❑	
Litter at picnic areas	❑	❑	❑	❑	❑	
Floating debris on the Forebay	❑	❑	❑	❑	❑	
Trails	❑	❑	❑	❑	❑	
Management of recreation at Forebay	❑	❑	❑	❑	❑	
Additional facilities and services	❑	❑	❑	❑	❑	
Condition of facilities at Forebay	❑	❑	❑	❑	❑	
Other_____	❑	❑	❑	❑	❑	

8. Is there anything else you would like us to know about Kilarc Forebay?

_____

9. Finally, what is your primary Zip Code where you live? ___ ___ ___ ___ ___ ***Thanks again for your participation!***

APPENDIX C

On-Site and Windshield Log Form

Kilarc Forebay On-site and Windshield Survey Log Form
(Use one of these forms each visit to the Project area)

Researcher: _____ Date: _____ Time: _____ Weather: _____

Location Code	No. of surveys per KR site	Description / Comments

Location Code	Name of survey and count area
KF 1	Kilarc Forebay Picnic Area
KF 2	Kilarc Forebay Group Picnic Area
KF 3	Kilarc Forebay Overflow Picnic Area
KF 4	Kilarc Forebay Water surface
KF 5	Kilarc Forebay Shoreline
KF 6	Kilarc Forebay Dispersed Sites
KF 7	Kilarc Forebay Powerhouse Area
KF 8	Kilarc Forebay Inlet Canal Area

APPENDIX D

Existing Use (Counts) Log Form

Kilarc Forebay Picnic Area (KF #1)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Picnic Area (KF 1)	Kilarc Forebay Picnic Area (KF 1)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Group Picnic Area (KF #2)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Group Picnic Area (KF 2)	Kilarc Forebay Group Picnic Area (KF 2)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Overflow Picnic Area (KF #3)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Overflow Picnic Area (KF 3)	Kilarc Forebay Overflow Picnic Area (KF 3)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Water Surface (KF #4)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Water Surface (KF 4)	Kilarc Forebay Water Surface (KF 4)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Shoreline (KF #5)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Shoreline (KF 5)	Kilarc Forebay Shoreline (KF 5)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Dispersed Sites (KF #6)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Dispersed Sites (KF 6)	Kilarc Forebay Dispersed Sites (KF 6)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Powerhouse Area (KF #7)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Powerhouse Area (KF 7)	Kilarc Forebay Powerhouse Area (KF 7)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				

Kilarc Forebay Inlrt Canal Area (KC #8)

Existing Use (counts) Log Form

Use one of these forms each visit to the Project area

Activity	Time visited	Kilarc Forebay Inlet Canal Area (KF 8)	Kilarc Forebay Inlet Canal Area (KF 8)	Vehicle License plates AM (~~strike through~~ if AM vehicle is absent in PM)			
Vehicles parked	# Vehicles						
	# w/ trailers						
Boats	# boat (motorized)						
	# boat (non-motorized)						
	# belly boats						
Picnic tables	# occupied						
Activity (# people)	# picnicking						
	# sunning						
	# swimming						
	# general recreation						
	# bank fishing						
	# boat fishing						
	# boat nature observation						
	# general boating						
Researcher_____ Date_____		Time: (**morning**)	Time: (**afternoon**)				