
State of California
The Resources Agency
Department of Water Resources

LAND USE REPORT

FINAL

L-1

**Oroville Facilities Relicensing
FERC Project No. 2100**



JULY 2004

**ARNOLD
SCHWARZENEGGER**
Governor
State of California

MIKE CHRISMAN
Secretary for Resources
The Resources Agency

LESTER SNOW
Director
Department of Water
Resources

**State of California
The Resources Agency
Department of Water Resources**

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FERC Project No. 2100**

This report was prepared under the direction of

Jim Martin.....Land Use Resource Area Manager, Department of Water Resources

by

Mark Greenig Senior Planner, EDAW, Inc.
Steve PavichEnvironmental Planner, EDAW, Inc.

Assisted by

Lisa Clement GIS Specialist, EDAW, Inc.
Josh Teigiser.....Environmental Planner, EDAW, Inc.

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REPORT SUMMARY

This Relicensing Study presents the results of a comprehensive evaluation of existing and planned land uses in the study area (defined as lands within ¼ mile of the Federal Energy Regulatory Commission [FERC] Project boundary), as well as a brief overview of historical land use that forms the context of current land use planning in the Oroville area. It also delineates complex patterns of land ownership in the study area in an effort to better understand the interrelationships between land ownership and land use. The information presented in this report will be used in the Preliminary Draft Environmental Assessment (PDEA) to evaluate the effects of Project alternatives on land use. It will also help identify land ownership and land use patterns that need to be considered when managing the Project and when planning for future improvements.

The methodology used to develop the baseline information on land use and ownership patterns in the study area is based on available geographic information system (GIS) data for the study area. This report uses GIS data as the primary tool in delineating, quantifying, and evaluating land use and ownership.

Existing land use issues, including land use incompatibility considerations, were identified during initial scoping for the Project. In addition, land use issues were identified by the Land Use, Land Management, and Aesthetics (LULMA) Work Group and local planning departments.

Land ownership within the study area is characterized by substantial public land holdings. All of the land within the Project boundary is owned by public entities, with the State of California (through the Department of Water Resources [DWR]) representing the largest public landowner in terms of size of holdings. The federal government also holds fee-title interest to lands within the Project boundary. These federal lands are administered by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM). In addition to these agencies, other public entities with land holdings in the study area include the Bureau of Indian Affairs (BIA), California Department of Fish and Game (DFG), California Department of Parks and Recreation (DPR), Butte County, City of Oroville, and other local districts¹. All remaining lands in the study area (but not within the Project boundary) are owned by private interests.

Land use within the study area is more diverse than land ownership patterns. To categorize the wide variety of land uses, a land use classification system was developed for this Report that utilizes eight major land use classifications: *Urban, Rural, Conservation, Recreation, Resource Extraction, Undeveloped/Habitat, Other, and Reservoir/Open Water*. These eight land uses were classified based on information obtained from three sources: 1) field surveys conducted by terrestrial resource

¹ These agencies may manage lands within the Project boundary via agreements with DWR, USFS, and/or BLM.

scientists as part of their vegetative cover mapping in Relicensing Study T-4, 2) review of aerial photographs and other GIS data, and 3) onsite evaluation.

The land use classification *Reservoir/Open Water*, which includes Lake Oroville, is the most prevalent land use category within the Project boundary and study area. Recreation also has a major influence on land use in the study area, especially within the Project boundary, where DPR manages much of the land as part of the Lake Oroville State Recreation Area (LOSRA). Conservation uses are also prevalent in the study area, as illustrated by the significant amount of public landowners that manage lands *primarily* for conservation purposes. Outside the Project boundary, but within the study area, the land use environment is especially diverse, with residential, industrial/commercial, and agricultural uses all present, as well as large quantities of land that are undeveloped and provide defacto habitat values.

A comprehensive evaluation of existing land use issues and compatibility considerations in the study area has been conducted as part of this study. Generally, land use issues facing the Project are limited. An analysis of those issues that have been identified through scoping, the Work Groups, and coordination with local planning departments will be included in the PDEA. Many of these issues are being addressed through proposed resource actions, which may become part of the proposed Project alternatives.

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ACRONYMS

AR	Agricultural Residential
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
C	Commercial
CalTrans	California Department of Transportation
cfs	cubic feet per second
DFG	California Department of Fish and Game
DPR	California Department of Parks and Recreation
DWR	California Department of Water Resources
EIS	Environmental Impact Statement
FAR	Foothill Area Residential
FERC	Federal Energy Regulatory Commission
FRRPD	Feather River Recreation and Park District
FRSA	Feather River Service Area
GIS	geographic information system
GOL	Grazing and Open Land
HDR	High Density Residential
I	Industrial
ISO	Independent System Operator
LDR	Low Density Residential
LOSRA	Lake Oroville State Recreation Area
LRMP	Land and Resource Management Plan
LULMA	Land Use, Management, and Aesthetics
maf	million acre-feet
msl	mean sea level
MW	megawatt
NF	National Forest
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Services
OFC	Orchard and Field Crops
OWA	Oroville Wildlife Area
P	Public
PDEA	Preliminary Draft Environmental Assessment
PG&E	Pacific Gas and Electric
ROD	Record of Decision
RMP	Resource Management Plan
SVRA	State Vehicular Recreation Area
SWP	State Water Project
TM	Timber-Mountain
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Lake Oroville Hydroelectric Project is the keystone of the California State Water Project (SWP). The Project provides water supply, flood control, power generation, recreation, fish and wildlife enhancement, and salinity control to the State of California, and is managed by the California Department of Water Resources (DWR). The Federal Energy Regulatory Commission (FERC) license for the Project expires in February of 2007 (FERC Project No. 2100); therefore, a relicensing process was initiated by DWR in June of 2000.

As part of Project relicensing, DWR decided to use an Alternative Licensing Procedure (ALP), which was initiated in December of 2000. This process involves a collaborative planning effort with local, State, and federal agencies with mandatory conditioning authority, Native American tribes, and local and regional recreation interests. Work groups representing major resource categories (e.g., Environmental, Engineering and Operations) are assisting DWR decision-making regarding relicensing issues, the scope of resource studies, and ultimately, protection, mitigation and enhancement (PM&E) measures. The Land Use, Land Management, and Aesthetics (LULMA) Work Group are assisting DWR with the development of the land use and aesthetics studies. These Relicensing Studies are: L-2 – *Land Management*, L-3 – *Comprehensive Plan Consistency Evaluation*, L-4 – *Aesthetic/Visual Resources*, and L-5 – *Fuel Load Management*.

The primary purpose of this report is to provide information related to land use and land ownership patterns on lands affected by the Project. A comprehensive evaluation and mapping of existing land use and ownership patterns has been conducted, including an analysis of known land use compatibility issues with existing Project facilities and operations; this information serves as the baseline condition and provides the context for future analysis of land use compatibility issues relevant to the Project. Specifically, this information will be useful for evaluating the effects of alternatives on land use and ownership patterns in the study area. It can also assist in the efficient management of the Project and planning future development as part of the new license for the Oroville Facilities. This report also evaluates land use and ownership issues identified during scoping and through the collaborative planning effort and offers a set of considerations pertaining to land use.

1.1.1 Statutory/Regulatory Requirements

DWR owns and operates the Oroville Facilities, a multipurpose water supply, flood control, power generation, recreation, fish and wildlife enhancement, and salinity control project on the Feather River in Butte County. The facilities currently operate under a license issued by FERC, which expires on January 31, 2007. DWR intends to submit

an application for a new FERC license at least two years prior to the expiration of the current license. The proposed relicensing process is based on cooperation and collaboration with federal and State resource agencies, Indian Tribes, local governments, non-governmental organizations (NGOs), and interested members of the public.

This study assesses the relationship between the Project and land use and ownership in the study area, as required to meet the relicensing requirements of the FERC as defined in the Code of Federal Regulations (18 CFR § 4.51(f)(6)). The following describes the required content of this study.

Report on land management and aesthetics. The report must discuss the management of land within the proposed Project boundary, including wetlands and floodplains, and the protection of the recreational and scenic values of the Project. The report must be prepared following consultation with local and State zoning and land management authorities and any federal or State agency with managerial authority over any part of the Project lands. Consultation must be documented by appending to the report a letter from each agency consulted indicating the nature, extent, and results of the consultation. The report must contain:

- (1) *A description of existing development and use of Project lands and all other lands abutting the Project impoundment;*
- (2) *A description of the measures proposed by the applicant to ensure that any proposed Project works, rights-of-way, access roads, and other topographic alterations blend, to the extent possible, with the surrounding environment; (see, e.g., 44 F.P.C. 1496, et seq.);*
- (3) *A description of wetlands or floodplains within, or adjacent to, the Project boundary, any short-term or long-term impacts of the Project on those wetlands or floodplains, and any mitigative measures in the construction or operation of the Project that minimize any adverse impacts on the wetlands or floodplains;*
- (4) *A statement, including an analysis of costs and other constraints, of the applicant's ability to provide a buffer zone around all or any part of the impoundment, for the purpose of ensuring public access to Project lands and waters and protecting the recreational and aesthetic values of the impoundment and its shoreline;*
- (5) *A description of the applicant's policy, if any, with regard to permitting development of piers, docks, boat landings, bulkheads, and other shoreline facilities on Project lands and waters; and*

- (6) *Maps or drawings that conform to the size, scale and legibility requirements of Sec. 4.39, or photographs, sufficient to show the location and nature of the measures proposed under paragraph (f)(6)(ii) of this section (maps or drawings in this exhibit may be consolidated).*

1.1.2 Study Area

The Oroville Facilities are located on the Feather River in the Sierra Nevada foothills in Butte County, California, approximately 75 miles north of Sacramento (Figure 1.1-1). The Project boundary, which includes all of the Oroville Facilities within the Project boundary, encompasses approximately 41,140 acres. For the purposes of this report, a larger study area has been defined; it includes the Project boundary in addition to non-Project lands located adjacent to and within ¼ mile of the Project boundary. Under this definition, the study area encompasses approximately 70,530 acres.

The discussion and findings in this report are presented by sub-areas that comprise the Project. Four sub-areas are used here: Lake Oroville (which includes the main reservoir and Feather River tributaries); Thermalito Forebay and Diversion Pool (which includes the area from Oroville Dam to the Forebay, including the Diversion Canal and portions of the Low Flow Channel [LFC] in the City of Oroville), Thermalito Afterbay, and the Oroville Wildlife Area (OWA). Generally, discussion at the sub-area level is qualitative in nature.

1.2 DESCRIPTION OF FACILITIES

The Oroville Facilities were developed as part of the SWP, a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The main purpose of the SWP is to store and distribute water to supplement the needs of urban and agricultural water users in Northern California, the San Francisco Bay area, the San Joaquin Valley, and Southern California. The Oroville Facilities are also operated for flood control and power generation, to improve water quality in the Delta, enhance fish and wildlife, and provide recreation.

FERC Project No. 2100 encompasses approximately 41,100 acres and includes Oroville Dam and Reservoir, three power plants (Hyatt Pumping-Generating Plant, Thermalito Diversion Dam Power Plant, and Thermalito Pumping-Generating Plant), Thermalito Diversion Dam, the Feather River Fish Hatchery and Fish Barrier Dam, Thermalito Power Canal, Oroville Wildlife Area (OWA), Thermalito Forebay and Forebay Dam, Thermalito Afterbay and Afterbay Dam, transmission lines, and a relatively large number of recreational facilities. An overview of these facilities is provided in Figure 1.2-1. Oroville Dam, along with two small saddle dams, impounds Lake Oroville, a 3.5-million-acre-foot (maf) capacity storage reservoir with a surface area of 15,810 acres at its maximum normal operating level of 900 feet above mean sea level (msl).

The hydroelectric facilities have a combined licensed generating capacity of approximately 762 megawatts (MW). The Hyatt Pumping-Generating Plant is the largest of the three power plants with a capacity of 645 MW. Water from the six-unit underground power plant (three conventional generating and three pumping-generating units) is discharged through two tunnels into the Feather River just downstream of Oroville Dam. The plant has a generating capacity of 16,950 cubic feet per second (cfs) and pumping flow capacity of 5,610 cfs,. Other generation facilities include the 3-MW Thermalito Diversion Dam Power Plant and the 114-MW Thermalito Pumping-Generating Plant.

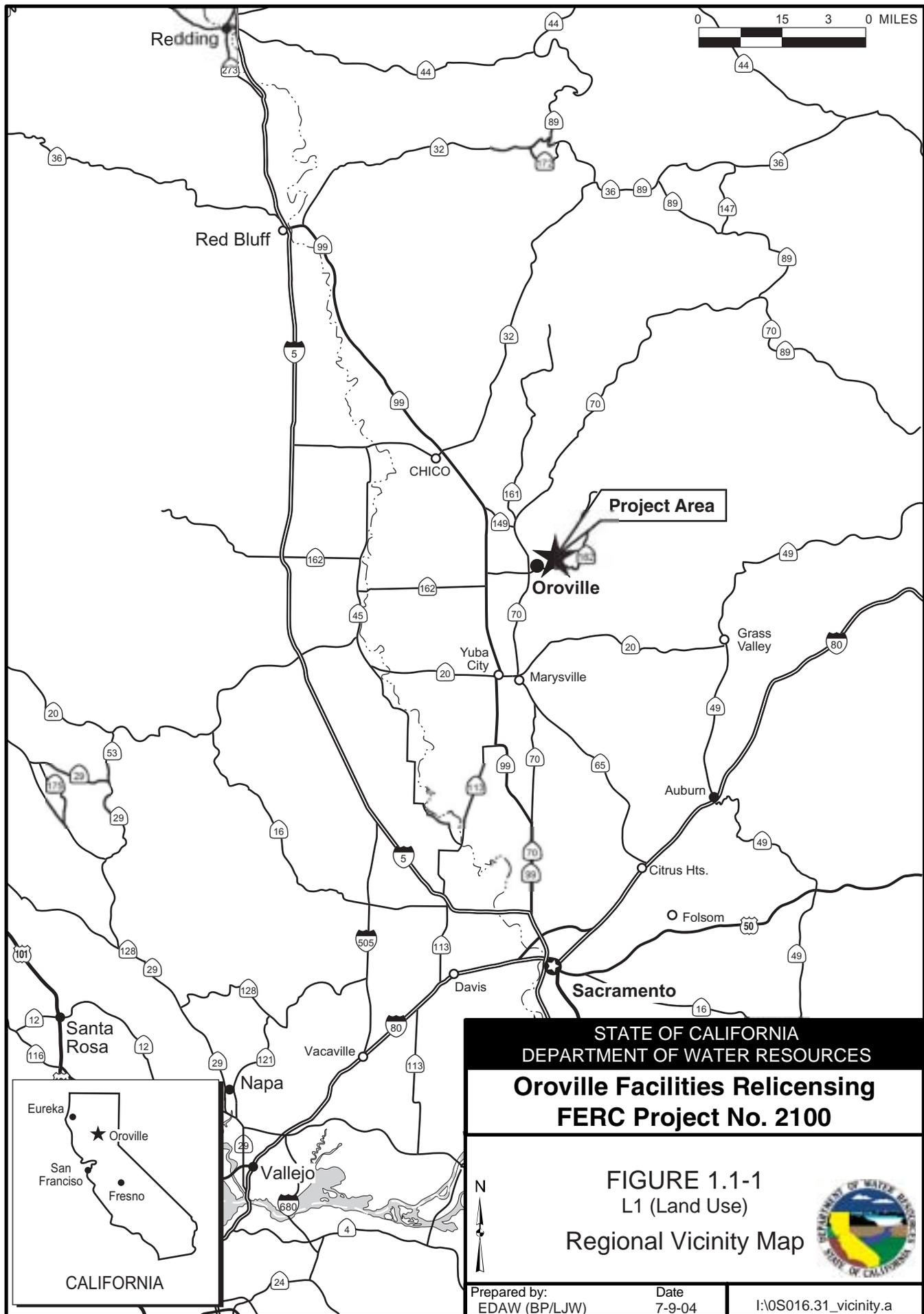
Thermalito Diversion Dam, four miles downstream of the Oroville Dam, creates a tail water pool for the Hyatt Pumping-Generating Plant and is used to divert water into the Thermalito Power Canal. Thermalito Diversion Dam Power Plant is a 3-MW power plant located on the left abutment of the diversion dam. The power plant releases a maximum of 615 cfs of water into the river.

The Thermalito Power Canal is a 10,000-foot-long channel designed to convey generating flows of 16,900 cfs to the Thermalito Forebay and pump-back flows to the Hyatt Pumping-Generating Plant. Thermalito Forebay is an off-stream regulating reservoir for the Thermalito Pumping-Generating Plant. The Thermalito Pumping-Generating Plant is designed to operate in tandem with the Hyatt Pumping-Generating Plant and has generating and pump-back flow capacities of 17,400 cfs and 9,120 cfs, respectively. When in generating mode, the Thermalito Pumping-Generating Plant discharges into Thermalito Afterbay, which is contained by a 42,000-foot-long earthfill dam. The Afterbay is used to release water into the Feather River downstream of the Oroville Facilities, help regulate the power system, provide storage for pump-back operations, provide recreational opportunities, and provide local irrigation water. Several local irrigation districts receive Lake Oroville water via the Afterbay.

The Fish Barrier Dam is downstream of the Thermalito Diversion Dam and immediately upstream of the Feather River Fish Hatchery. The flow over the dam maintains fish habitat in the low-flow channel of the Feather River between the dam and the Thermalito Afterbay outlet, and provides attraction flow for the hatchery. The hatchery is an anadromous fish hatchery intended to compensate for salmon and steelhead spawning grounds made unreachable by construction of Oroville Dam. Hatchery facilities have a production capacity of 10 million fall-run salmon, 5 million spring-run salmon, and 450,000 steelhead annually (pers. comm., Kastner 2003). However, diseases have occasionally reduced hatchery production in recent years.

The Oroville Facilities support a wide variety of recreational opportunities. These opportunities include boating (several types), fishing (several types), fully developed and primitive camping (including boat-in and floating sites), picnicking, swimming, horseback riding, hiking, off-road bicycle riding, wildlife watching, and hunting. There are also visitor information sites with cultural and informational displays about the

Insert Figure 1.1-1.



STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

**Oroville Facilities Relicensing
FERC Project No. 2100**

FIGURE 1.1-1
L1 (Land Use)
Regional Vicinity Map



Prepared by:
EDAW (BP/LJW)

Date
7-9-04

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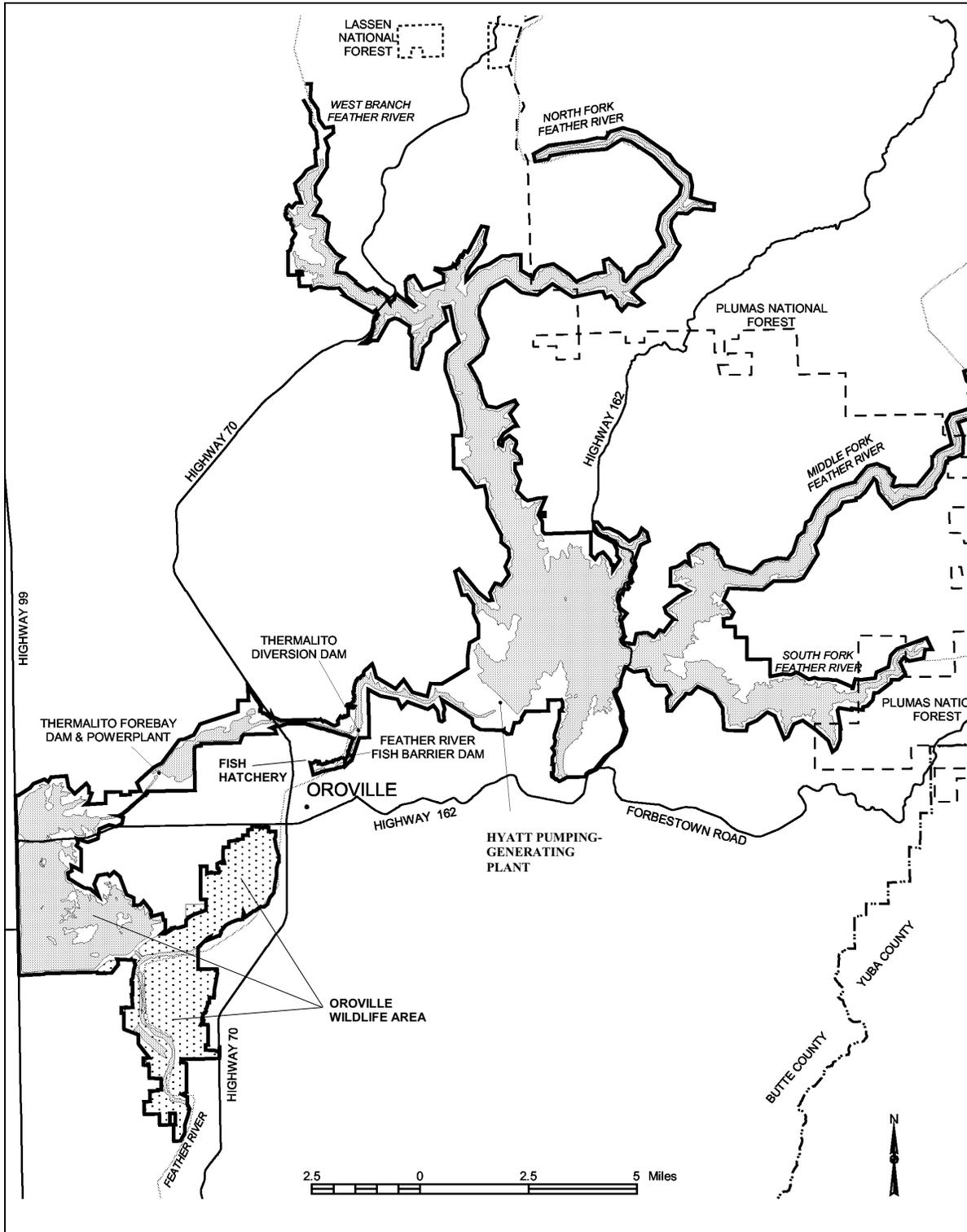


Figure 1.2-1. Oroville Facilities FERC Project 2100 boundary.

developed facilities and the natural environment. There are major recreation facilities at Loafer Creek, Bidwell Canyon, Spillway, Lime Saddle, and Thermalito Forebay. Lake Oroville has two full-service marinas, five car-top boat launch ramps, 10 floating campsites, and seven two-stall floating toilets. There are also recreation facilities at the Lake Oroville Visitors Center, Thermalito Afterbay, and OWA.

The OWA comprises approximately 11,000 acres west of Oroville that is managed for wildlife habitat and recreational activities. It includes Thermalito Afterbay and surrounding lands (approximately 6,000 acres) along with 5,000 acres adjoining the Feather River. The 5,000-acre area is adjacent to or straddles 12 miles of the Feather River, and includes willow- and cottonwood-lined ponds, islands, and channels. Recreation areas include dispersed recreation (hunting, fishing, and bird watching), plus recreation at developed sites, including Monument Hill DUA, model airplane grounds, and three boat launches on the afterbay and two on the river, and two primitive camping areas. The California Department of Fish and Game's (DFG) habitat enhancement program includes a wood duck nest-box program and dry-land farming for nesting cover and improved wildlife forage. Limited gravel extraction also occurs in a few locations.

1.3 CURRENT OPERATIONAL CONSTRAINTS

Operation of the Oroville Facilities varies seasonally, weekly, and hourly, depending on hydrology and the objectives that the DWR is trying to meet. Typically, releases to the Feather River are managed to conserve water while meeting a variety of water delivery requirements, including flow, temperature, fisheries, diversion, and water quality. Lake Oroville stores winter and spring runoff for release to the Feather River as necessary for Project purposes. Meeting the water supply objectives of the SWP has always been the primary consideration for determining Oroville Facilities operation (within the regulatory constraints specified for flood control, instream fisheries, and downstream uses). Power production is scheduled within the boundaries specified by the water operations criteria noted above. Annual operations planning is conducted for multiyear carryover storage. The current methodology is to retain half of the Lake Oroville storage above a specific level for subsequent years. Currently, that level has been established at 1.0 maf; however, this does not limit drawdown of the reservoir below that level. If hydrology is drier or requirements greater than expected, additional water could be released from Lake Oroville. The operations plan is updated regularly to reflect forecast changes in hydrology and downstream operations. Typically, Lake Oroville is filled to its maximum operating level of 900 feet above msl in June and then lowered as necessary to meet downstream requirements, to a minimum level in December or January (approximately 700 msl). During drier years, the reservoir may be drawn down more and may not fill to desired levels the following spring. Project operations are directly constrained by downstream operational demands and flood management criteria as described below.

1.3.1 Downstream Operation

An August 1983 agreement between DWR and DFG entitled *Agreement Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish & Wildlife* (DWR and DFG 1983) sets criteria and objectives for flow and temperatures in the low-flow channel and the reach of the Feather River between Thermalito Afterbay and Verona. This agreement: (1) establishes minimum flows between the Thermalito Afterbay outlet and Verona that vary by water year type; (2) requires flow changes under 2,500 cfs to be reduced by no more than 200 cfs during any 24-hour period (except for flood management, failures, etc.); (3) requires flow stability during the peak of the fall-run Chinook salmon spawning season; and (4) sets an objective of suitable temperature conditions during the fall months for salmon and during the spring/summer for shad and striped bass.

1.3.1.1 Instream Flow Requirements

The Oroville Facilities are operated to meet minimum flows in the lower Feather River as established by the 1983 agreement (see above). The agreement specifies that Oroville Facilities release a minimum of 600 cfs into the Feather River from the Thermalito Diversion Dam for fisheries purposes. This is the total volume of flows from the diversion dam outlet, the diversion dam power plant, and the Feather River Fish Hatchery pipeline.

Generally, the instream flow requirements below Thermalito Afterbay are 1,700 cfs from October through March, and 1,000 cfs from April through September. However, if runoff for the previous April–July period is less than 1,942,000 acre-feet (af) (i.e., the 1911–1960 mean unimpaired runoff near Oroville), the minimum flow can be reduced to 1,200 cfs from October to February, and 1,000 cfs for March. A maximum flow of 2,500 cfs is not exceeded from October 15 through November 30 to prevent spawning in overbank areas that might become de-watered.

1.3.1.2 Temperature Requirements

The Diversion Pool provides the water supply for the Feather River Fish Hatchery. The hatchery temperature objectives are 52°F for September, 51°F for October and November, 55°F for December through March, 51°F for April through May 15, 55°F for last half of May, 56°F for June 1–15, 60°F for June 16–August 15, and 58°F for August 16–31. In April through November, a temperature range of plus or minus 4°F is allowed for objectives.

There are several temperature objectives for the Feather River downstream of the Thermalito Afterbay outlet. During the fall months, after September 15, the temperatures must be suitable for fall-run Chinook salmon. From May through August, the temperatures must be suitable for shad, striped bass, and other fish.

National Oceanic and Atmospheric Administration National Marine Fisheries Services (NOAA Fisheries) has also established an explicit criterion for steelhead trout and spring-run Chinook salmon, memorialized in a biological opinion on the effects of the Central Valley Project and SWP on Central Valley spring-run Chinook and steelhead. As a reasonable and prudent measure, DWR attempts to control water temperature at Feather River mile 61.6 (Robinson's Riffle in the low-flow channel) from June 1 through September 30. This measure attempts to maintain water temperatures less than or equal to 65°F on a daily average. The requirement is not intended to preclude pump-back operations at the Oroville Facilities needed to assist the State of California with supplying energy during periods when the California Independent System Operator (ISO) anticipates a Stage 2 or higher alert.

The hatchery and river water temperature objectives sometimes conflict with temperatures desired by agricultural diverters. Under existing agreements, DWR provides water for the Feather River Service Area (FRSA) contractors. The contractors claim a need for warmer water during spring and summer for rice germination and growth (i.e., minimum 65°F from approximately April through mid-May, and minimum 59°F during the remainder of the growing season), though there is no explicit obligation for DWR to meet the rice water temperature goals. However, to the extent practical, DWR does use its operational flexibility to accommodate the FSRA contractors' temperature goals.

1.3.1.3 Water Diversions

Monthly irrigation diversions of up to 190,000 af (July 2002) are made from the Thermalito Complex during the May–August irrigation season. The total annual entitlement of the Butte and Sutter County agricultural users is approximately 1.0 maf. After these local demands are met, flows into the lower Feather River (and outside of the Project 2100 boundary) continue into the Sacramento River and into the Sacramento-San Joaquin Delta. In the northwestern portion of the Delta, water is pumped into the North Bay Aqueduct. In the south Delta, water is diverted into Clifton Court Forebay where the water is stored until it is pumped into the California Aqueduct.

1.3.1.4 Water Quality

Flows through the Delta are maintained to meet Bay-Delta water quality standards arising from DWR's water rights permits. These standards are designed to meet several water quality objectives such as salinity, Delta outflow, river flows, and export limits. The purpose of these objectives is to attain the highest reasonable water quality, considering all demands being made on the Bay-Delta waters. In particular, they protect a wide range of fish and wildlife including Chinook salmon, Delta smelt, striped bass, and the habitat of estuarine-dependent species.

1.3.2 Flood Management

The Oroville Facilities are an integral component of the flood management system for the Sacramento Valley. During the wintertime, the Oroville Facilities are operated under flood control requirements specified by the U.S. Army Corps of Engineers (USACE). Under these requirements, Lake Oroville is operated to maintain up to 750,000 af of storage space to allow for the capture of significant inflows. Flood control releases are based on the release schedule in the flood control diagram or the emergency spillway release diagram prepared by the USACE, whichever requires the greater release. Decisions regarding such releases are made in consultation with the USACE.

The flood control requirements are an example of multiple use of reservoir space. When flood management space is not required to accomplish flood management objectives, the reservoir space can be used for storing water. From October through March, the maximum allowable storage limit (point at which specific flood release would have to be made) varies from about 2.8 maf to 3.2 maf to ensure adequate space in Lake Oroville to handle flood flows. The actual encroachment demarcation is based on a wetness index, computed from accumulated basin precipitation. This allows higher levels in the reservoir when the prevailing hydrology is dry. When the wetness index is high in the basin (i.e., high potential runoff from the watershed above Lake Oroville), required flood management space is at its greatest to provide the necessary flood protection. From April through June, the maximum allowable storage limit is increased as the flooding potential decreases, which allows capture of the higher spring flows for use later in the year. During September, the maximum allowable storage decreases again to prepare for the next flood season. During flood events, actual storage may encroach into the flood reservation zone to prevent or minimize downstream flooding along the Feather River.

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2.0 NEED FOR STUDY

This report is being prepared to meet FERC's requirement to prepare a report on lands affected by the proposed project (see Section 1.1.1) and to address land use issues that were identified by the Land Use, Land Management, and Aesthetics (LULMA) Work Group. This report identifies land ownership patterns, as well as existing and planned land uses, within the study area. By doing so, it will be possible to determine how existing and planned land uses within the study area may potentially influence each other and be affected by alternatives that will be evaluated in the Preliminary Draft Environmental Assessment (PDEA).

The report will also serve as a data source for other studies related to relicensing, providing data that will help DWR and other interested entities in the future management of the Project and the lands near it.

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3.0 STUDY OBJECTIVES

The objectives of this study are to:

- € Describe land use and ownership patterns in the study area;
- € Describe historic development and use of lands within and lands bordering the Project;
- € Describe existing and planned land uses within the study area;
- € Address land use issues identified by the LULMA Work Group and other relevant land use issues; and
- € Identify opportunities and constraints related to land use.

3.1 APPLICATION OF STUDY INFORMATION

The application of information collected and generated as part of this study was primarily for data exchange among work groups and other relicensing studies and for use in future PDEA efforts. This information is not intended for site-specific land use analyses.

3.1.1 Other Studies

Prior to starting this study, the research team met with other researchers conducting studies as part of the other work groups to determine what type and when relevant data would be collected and available for use amongst the work groups. This study is continuing limited coordination efforts with the Engineering and Operations, Environmental, Cultural Resources, and Recreation and Socioeconomics Work Groups. Much of the data collection that was completed for this study occurred in conjunction with Relicensing Study L-2 – *Land Management Report* and Relicensing Study L-3 – *Comprehensive Plans Consistency Evaluation*.

3.1.2 Environmental Documentation

The data collected in this report will primarily be used as baseline information that will be used for evaluating the effects of the alternatives presented in the PDEA on land use within and abutting the Project boundary.

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4.0 METHODOLOGY

4.1 STUDY DESIGN

This report is based on Relicensing Study L-1, the study plan that was developed in collaboration with the LULMA Work Group and approved by the Plenary Group. The study plan identified several tasks and sub-tasks that were required to meet the objectives of the Work Group (Table 4.1-1).

Table 4.1-1. Required tasks to meet Work Group objectives.

Task 1 – Existing Conditions	
Sub-Task 1A	Data collection (literature review and interviews)
Sub-Task 1B	Mapping
Task 2 – Evaluation and Analysis of Data	
Sub-Task 2A	Address specific land use concerns identified by the LULMA Work Group
Sub-Task 2B	Address new issues that may be uncovered during the study
Sub-Task 2C	Opportunity and constraints analysis

This Interim Draft Report presents the findings from Task 1. The findings for Task 2 will be reported in the Final Report.

4.2 HOW AND WHERE THE STUDIES WERE CONDUCTED

Separate methodologies were implemented for the development of existing land ownership, existing land use, and planned land use information. These distinct methodologies are described below.

4.2.1 Methodology for Land Ownership

Land ownership was mapped and quantified for all public and private lands in the study area. Public ownership is presented and discussed on an agency level. However, it should be noted that individual agencies do not hold fee-title interest in public lands; instead, ownership interest, if strictly interpreted, rests with the State of California for all State lands and the United States government for federal lands. For purposes of this report, State ownership is attributed to the agency with “control and possession” on State lands, and federal ownership is assigned to the agency with administrative jurisdiction on federal lands. Subsequent transfer of management rights and current management jurisdiction is addressed in Relicensing Study L-2 – *Land Management Report*.

Existing land ownership information presented in this study is based primarily on existing Geographic Information System (GIS) data available for the study area. For the purposes of this report, several sources of GIS data were used; however, the initial

starting point was the Butte County parcel base, which includes information typically listed on property tax rolls, such as owner name, assessor parcel number, etc., but does not provide agency-level ownership for publicly-owned properties. For example, properties that are owned by DWR are listed as being owned by the State of California; this holds true for federally-owned lands as well. For the purposes of this report, it is important to understand which agency has administrative jurisdiction (or ownership) over properties in the study area. Therefore, other secondary sources of information were used to identify agency-level ownership as described below.

Important statements were received and used, in lieu of the parcel base, for ownership of State lands within the Project boundary. The following describes the ownership structure within the Project boundary per communication with DWR Division of Land and Right-of-Way (pers. comm., Leong 2003):

The State of California holds fee-title ownership to all State lands within the FERC boundary. The Department of Water Resources (DWR) acquired the State lands and its use of the land for the construction, operation, and maintenance of Oroville Division of the State Water Resources Development System. DWR has effectively transferred certain specific interest rights on substantial portions of Project land to other State Departments (i.e., California Department of Parks and Recreation, California Department of Fish and Game) under agreements for “transfer of control and possession,” a legal document that basically gives the receiving Department a specific right or interest to carry out specific terms of use that are not in conflict with DWR’s underlying control of the lands for the State Water Resources Development System. Federal interests, which include Bureau of Land Management and U.S. Forest Service, own the other public lands in the Project area. No privately owned land exists within the FERC boundary.

The delineation of federal lands was based on public ownership data acquired from the Bureau of Land Management (BLM) and DWR. BLM provided updated information on their land holdings in the Oroville area and also provided State-wide public ownership data that were used to identify other federal landowners in the study area.

Other State-owned lands located outside the Project boundary, but within the study area, namely properties administered by the California Department of Parks and Recreation (DPR) and the DFG, were identified by data specific to these individual agencies.

For other properties located outside the Project boundary (but within the ¼-mile study area), information from the County parcel records was used. For the most part, these properties are held by private interests, but also include lands administered by local governments (i.e., Butte County and the City of Oroville) and quasi-public organizations,

such as the Feather River Recreation and Park District, as well local school districts, irrigation districts, etc.

There are also features, namely road rights-of-way or areas without an official parcel number (often attributed to public trust lands such as the river channel). Roads that were constructed/re-constructed as part of the development of the Oroville Facilities are held in fee by the State (i.e., California Department of Transportation [CalTrans]) or Butte County, depending on whether it is a State highway or county road (pers. comm., Edell 2004). Because the ownership of these linear features is not particularly pertinent to the broader context of land ownership in the study area, they have been merged with the surrounding land ownership patterns for areas within the Project boundary, and classified as *Other* outside the Project boundary.

The results of the evaluation of land ownership in the study area are presented in Section 5.2 of this report.

4.2.2 Methodology for Delineating Existing Land Use Patterns

Existing land use within the study area was organized into eight major land use classifications:

- € *Urban,*
- € *Rural,*
- € *Conservation,*
- € *Resource Extraction,*
- € *Recreation,*
- € *Undeveloped/Habitat,*
- € *Other,* and
- € *Reservoir/Open Water.*

Sub-classifications were used to further define the *Urban* and *Rural* major classifications. Urban land uses were broken down into the following sub-classifications: *Residential, Commercial/Industrial, Project Facilities,* and *Other Urban*. Rural land uses are organized into two sub-classifications: *Rural Residential* and *Agriculture*. No sub-classifications have been developed for the other major land use classifications.

The primary data source used to delineate land uses was the vegetation mapping developed in Relicensing Study T-4 (Biodiversity, Vegetation Communities, and Wildlife Habitat Mapping) by DWR (please refer to study T-4 for more information on the vegetation mapping effort). While collecting vegetative cover data, DWR staff also mapped certain types of land uses to meet the needs of this land use study. The land use data that were collected by DWR staff as part of the vegetation mapping represent

the most complete existing land use data available for the study area. Descriptions of the vegetation mapping categories are included in licensing study T-4.

Because the level of detail in DWR's mapping is beyond the level necessary to provide a general characterization of land use in the study area, the vegetation classifications have been re-organized for the purposes of this study. Table 4.2-1 shows how the vegetation map codes relate to the land use classifications used in this report.

Table 4.2-1. Land use relationships to vegetation mapping.

Land Use Classification	Vegetation Map Code ¹
Urban	
Residential	Residential
Commercial/Industrial	<i>N/A (see 5.3.1.1)</i>
Project Facilities	<i>N/A (see 5.3.1.1)</i>
Other Urban ²	Urban/Disturbed
Rural	
Rural Residential	Rural/Ranch
Agriculture	Fallow field; Hayfield; Orchard (deciduous and evergreen); Pasture; Rice; Row crops (dry land and irrigated); and Vineyard
Recreation	
	<i>N/A (see 5.3.1.3)</i>
Conservation	
	<i>N/A (see 5.3.1.4)</i>
Resource Extraction	
	<i>N/A (see 5.3.1.5)</i>
Undeveloped/Habitat	Includes the following habitat types: Algae; Mixed aquatic; Mosquito fern; Water-primrose; Water-meal; Black willow riparian forest; Black willow/blackberry scrub; Black willow/white alder riparian forest; Cottonwood/black willow riparian forest; Foothill/montane mixed riparian forest; Fremont cottonwood riparian forest; Mixed willow riparian forest; Non-native riparian forest; Valley mixed riparian forest; Valley oak riparian forest; Arundo scrub; Blackberry scrub; Blackberry/willow scrub; Mixed riparian scrub; Mixed willow scrub; Narrowleaf willow scrub; Non-native riparian scrub; Blue oak woodland; Blue oak woodland/mixed chaparral; Blue oak/foothill pine woodland; Blue oak-foothill pine woodland/chaparral; Foothill pine woodland/chaparral; Foothill pine-mixed oak woodland; Foothill pine-mixed oak woodland/chaparral; Mixed oak woodland; Mixed oak woodland/chaparral; Valley oak woodland; California annual grassland; Disturbed grassland; Short forbland; Tall forbland; Elderberry savanna; Mixed chaparral; Whiteleaf manzanita chaparral; Bulrush; Bulrush/cattail; Cattail; Mixed emergent vegetation; Rush; Rush/verbena; Seep/wet area; and Verbena
Other	Disturbed; Eucalyptus; Gravel tailings; Gravel/sandbar; and Rock outcrop (serpentine, volcanic, and other)
Reservoir/Open Water	Lake; Pond; Canal; and Riverine

¹ Definition of Vegetation map codes are provided in Study T-4.

² All areas coded as Urban/Disturbed in the vegetation mapping that were not identified as Commercial/Industrial or Project Facility.
Source: EDAW 2003

In addition to the vegetation mapping, other data sources were used to identify land uses that were not specifically mapped as part of the vegetation mapping effort. *Commercial/Industrial* land uses and *Project Facilities* were identified by reviewing aerial photographs of the study area and through limited ground-truthing. Lands identified as *Conservation* were delineated based on land ownership and management information. It is assumed that most lands owned/managed by the U.S. Forest Service (USFS) and the DFG are used primarily for conservation purposes, and thus are classified accordingly. However, it is acknowledged that portions of lands under USFS and DFG jurisdiction provide opportunities for recreation and resource extraction uses. Specifically, the USFS manages part of the National Forest land in the study area for potential timber harvest and DWR leases gravel mining operations in the OWA, which are not conservation oriented; as a result, these areas were re-classified as *Resource Extraction*. In addition, DFG and the DPR maintain active recreation areas within and adjacent to the OWA, namely the Rabe Road Shooting Area and Clay Pit State Vehicular Recreation Area (SVRA), respectively, which are more suited to be classified as *Recreation*. Similarly, lands managed by the DPR are identified as primarily providing *Recreation* uses, although it is acknowledged that many of these lands (particularly lands around the Lake Oroville that are undeveloped) also indirectly provide habitat and conservation values.

The results of the evaluation of land use in the study area are presented in Section 5.3.

4.2.3 Methodology for Characterizing Future Land Use Direction

The Butte County General Plan provides a vision for future land use and development in Butte County and the associated General Plan land use map represents a planned land use pattern for the County. As such, the Butte County General Plan (and associated GIS data) was used to characterize future land use direction in the vicinity of the Oroville Facilities. The Land Use Element of the General Plan is general as to the locations and boundaries of proposed uses and instead focuses on the types of land uses allowed within a particular land use designation and policies affecting development in the County. However, the land use map delineates allowable land uses spatially, and thus, depicts anticipated future land use patterns, which should be considered in the relicensing process. The General Plan land use map designates land throughout the entire County, including the incorporated cities of Oroville, Paradise, Chico, Gridley, and Biggs. Although these incorporated jurisdictions may have their own general plan and land use mapping, the County mapping must be consistent with these jurisdictions, and therefore was used as a proxy for future land use direction in incorporated areas in the study area (i.e., City of Oroville).

The results of the evaluation of future land use direction in the study area are presented in Section 5.4.

4.2.4 Methodology for Proposed Land Uses

Proposed land uses represent those projects within the study area that have been identified by local planning departments as being on record with, but not necessarily approved by, these local jurisdictions. However, not every approved project (e.g., single-family development) is pertinent to this study, and therefore, criteria were established to screen for projects that are potentially relevant for the purposes of this study. Projects were considered relevant only if they are over 5 acres in size for residential use or over 40,000 square feet for commercial use and located in the study area.

The planning departments of Butte County and the City of Oroville were consulted to identify proposed projects that were on record in the Oroville area. This information was obtained in order to identify proposed projects that could change existing land uses in the study area. This information is important to have in order to evaluate how compatible or incompatible alternatives that will be evaluated in the PDEA would be with proposed changes to nearby land uses.

The results of the evaluation of proposed land uses in the study area are presented in Section 5.5.

5.0 STUDY RESULTS

5.1 HISTORICAL AND REGIONAL CONTEXT FOR LAND USE & OWNERSHIP

5.1.1 Historical Land Use and Development of Oroville Facilities

Historically, a wide range of economic activities have occurred in the Oroville area. They include gold mining, agriculture, railroading, lumber processing, and recreation. The predominantly rural nature of the greater Oroville area has not changed substantially over time. Today, this region has shifted away from resource extraction and processing, but continues to be dominated by agricultural land uses, namely orchards and crop production. In addition, since the construction of the Oroville Facilities, recreation has become an important part of the local economy.

Due to the region's proximity to several major watercourses, including the Feather River, flooding has historically been a major concern facing residents of the area. In response to concerns over flooding and the need for water supplies to serving increasing agricultural and population pressures, it was clear that a major water supply/flood control project was warranted in the Oroville area. In the 1950s the State Legislature approved development of the water resources of the Feather River watershed, including a dam near the City of Oroville, and construction of a water system that would provide additional water supplies. Development and administration of these plans was vested with DWR.

Partially as a result of the development of the Oroville Facilities, the area immediately adjacent to the Oroville Facilities began to experience increased development. After the construction of the Oroville Facilities, the local economy began to shift from resource extraction industries to recreation-serving industries. Recreation associated with the Oroville Facilities remains an important aspect of the City's economy.

Since the construction of the dam, growth in the Oroville area has been sporadic. The population of the City of Oroville in 1970 was approximately 7,540 persons. After construction of the dam in 1971, the City's population grew to approximately 8,680 in 1980, 11,890 in 1990, and 13,000 in 2000 (DOF 2003). These figures indicate that growth was considerably higher during the 1980s (37 percent) relative to the 1970s (15.2 percent) and the 1990s (9.4 percent). More recent growth in the greater Oroville area has been largely due to urban-to-rural migration, rather than major economic activity in the area (Butte County 1996).

Higher rates of development in the City during the 1970s and 1980s were mirrored by the significant residential development in the Kelly Ridge area on the south shore of Lake Oroville in unincorporated Butte County. Kelly Ridge is one of only five areas in Butte County that have received 3 percent or more increase in the number of new parcels during this time frame from the period of 1972-1979, accounting for 15 percent of all new parcels in the County during that period (Butte County 1979).

5.1.2 Regional Land Use and Ownership Patterns

The Project boundary and the study area, are located entirely within Butte County. Portions of the Project boundary and study area extend into the City of Oroville. Generally, the regional land use environment is rural, with several incorporated cities (i.e., Oroville, Paradise, Chico, Biggs, and Gridley) representing the majority of development in the region. In total, these five incorporated areas only account for 38,646 acres, or 3.6 percent, of the 1.07 million acres that comprise Butte County (Butte County 1996). Based on the extent of the study area, the discussion below focuses on regional land use and ownership/management patterns in Butte County as a whole, and then, more specifically, in the City of Oroville.

5.1.2.1 Butte County

Regional land use and ownership information for Butte County was derived from the Land Use Element of the Butte County General Plan (Butte County 1979). (Note: Butte County is in the process of updating their General Plan). Butte County encompasses approximately 1670 square miles (1.07 million acres), which is divided into two distinct natural environments: a valley area representing the northeastern reaches of the Sacramento Valley and a foothill/mountain region located east of the valley. The valley floor represents the largest environment type in the County approximately (45 percent), with the foothills and mountains representing the remaining approximately 25 percent and 39 percent of the County, respectively.

Land use in the County consists predominantly of rural uses, namely agriculture, timber production, livestock grazing, and resource management. These land uses occur on approximately 71 percent of the County's total land area. Land under the government ownership represents an additional 21 percent of the County land area, a large proportion of which could be considered as resource management land as well. The remaining 8 percent of the County is characterized by urban use (i.e., areas within community water or sewer systems with parcels of less than one acre) and transitional use (i.e., areas outside of community water or sewer systems with parcels of less than ten acres), which are described in more detail below.

The western half of the County, comprising the agricultural and urban areas, has been largely influenced by human development. The agricultural character of the County is especially evident in the western one-third of the County, where extensive agricultural areas dominate the land use environment. The eastern portion of the County retains its natural foothill/mountain character, with dispersed human activities and modification throughout the lower and middle elevations and logging activities in portions of the middle and higher elevations. Historically, up to approximately one-third of the County's land area was devoted to commercial forest land under both public and private ownership.

In 1975, approximately 70 square miles (or 4 percent of all land) in Butte County was devoted to urban uses. These urban uses are located primarily in the western portion of

the County, in the incorporated areas of Chico, Oroville, and Paradise. Transitional or semi-urban uses account for an additional four percent of the existing land use in the County. This pattern is reinforced by the fact that only five areas within Butte County have received three percent or more of the total number of new parcels between 1972 and 1979, with the Kelly Ridge area near Oroville accounting for 15 percent of all county-wide land divisions. In terms of land management, a substantial portion (roughly 21 percent) of the County is publicly owned and managed by various federal, State, and local agencies. Public agencies with jurisdiction over lands in the region include the USFS, BLM, DWR, DPR, and DFG; Butte County and other local jurisdictions own and/or manage a relatively limited number of properties.

In the unincorporated areas of Butte County, the generalized land use distribution is slightly different and use different designations for land use than those used in this report. In 1996, the predominant land use in unincorporated Butte County was *Forestry* (32.3 percent), followed by *Orchard and Field Crops* (27.7 percent), *Grazing* (16.7 percent), *Rural Development* (16.5 percent), *Other* (i.e., wetlands, riparian areas, and other open space) (4.1 percent), and *Urban* (2.7 percent) (Butte County 1996).

5.1.2.2 City of Oroville

Local land use patterns in the City of Oroville are based, in part, on an analysis of the Oroville economy prepared as part of the relicensing process. Generally, this city of 13,000 people is relatively urban in nature. Land uses include commercial, industrial (associated with extractive industries and the facilities associated with the Oroville Project), residential, and recreation. Most of the greater Oroville area (which includes surrounding areas located in unincorporated Butte County) is rural and similar to that in the description of Butte County above.

Commercial establishments in Oroville are distributed in a pattern that follows the historic growth and development of the community. The City's downtown district contains government offices including the City Hall, the Oroville School District Offices, and the Butte County Service Center. The retail mix in the downtown district appears to be strongly oriented toward the tourist market. Antiques, gifts, collectibles, jewelry, clothing, and eating and drinking establishments comprise the majority of downtown businesses. Professional offices and offices of non-profit corporations also complement the retail mix of the downtown. Along Oroville Dam Boulevard, the land use focus is on commercial retail establishments, many of which have been constructed since the completion of Oroville Dam. Olive Highway provides access to Lake Oroville facilities, local casinos, and to a large population of rural residents of the Oroville area who live in outlying areas.

Industrial uses are found within the city limits and are generally located along the east side of Highway 70. These uses represent extractive industries (e.g., timber processing) and general industrial warehouses and shops. Gravel operations and associated industrial uses, as well as some commercial businesses, are located on the west side of Highway 70, which is for the most part outside the city limits.

Although there are distinct residential neighborhoods in Oroville, much of the residential use can be characterized as low-density, scattered developments with many vacant parcels. This is due to the fact that the city did not grow from a single core area, but instead through the merging of the distinct communities of downtown Oroville, Thermalito, and South Oroville (Butte County 1996).

5.2 LAND OWNERSHIP

This section provides an overview of land ownership patterns in the study area organized by federal, State, local, and private interests. The discussion of land ownership also includes spatial information related to ownership patterns relative to four distinct study sub-areas: 1) Lake Oroville, 2) the Thermalito Diversion Pool and Afterbay, 3) the Thermalito Afterbay, and 4) the LFC. Where appropriate, broad-scale management information is provided for public landowners; detailed information on land management in the study area is provided in Relicensing Study L-2 – Land Management Report.

5.2.1 Types of Land Owners

The discussion of land ownership types focuses on ownership patterns in the study area. Figures 5.2-1a, 5.2-1b, and 5.2-1c illustrate land ownership patterns in the study area. Overall, approximately 69 percent of land within the study area is publicly owned. All of the land within the Project boundary is owned and/or administered by public agencies (i.e., DWR, DFG, BLM and USFS), although other public agencies, such as DPR, provide management oversight by agreement, easement, or other legal binding document. Of the publicly-owned land in the study area, 23.2 percent of the total is owned by the federal government, 75.9 percent is owned by the State, and 0.9 percent is owned by local jurisdictions. Private interests hold approximately 29.3 percent of land in the study area. The remaining 1.7 percent of land is considered to be in Other ownership, which primarily represents road rights-of-way that are often held in fee by the State (i.e., CalTrans) or County. A summary of land ownership within the Project boundary and in the study area is provided in Table 5.2-1.

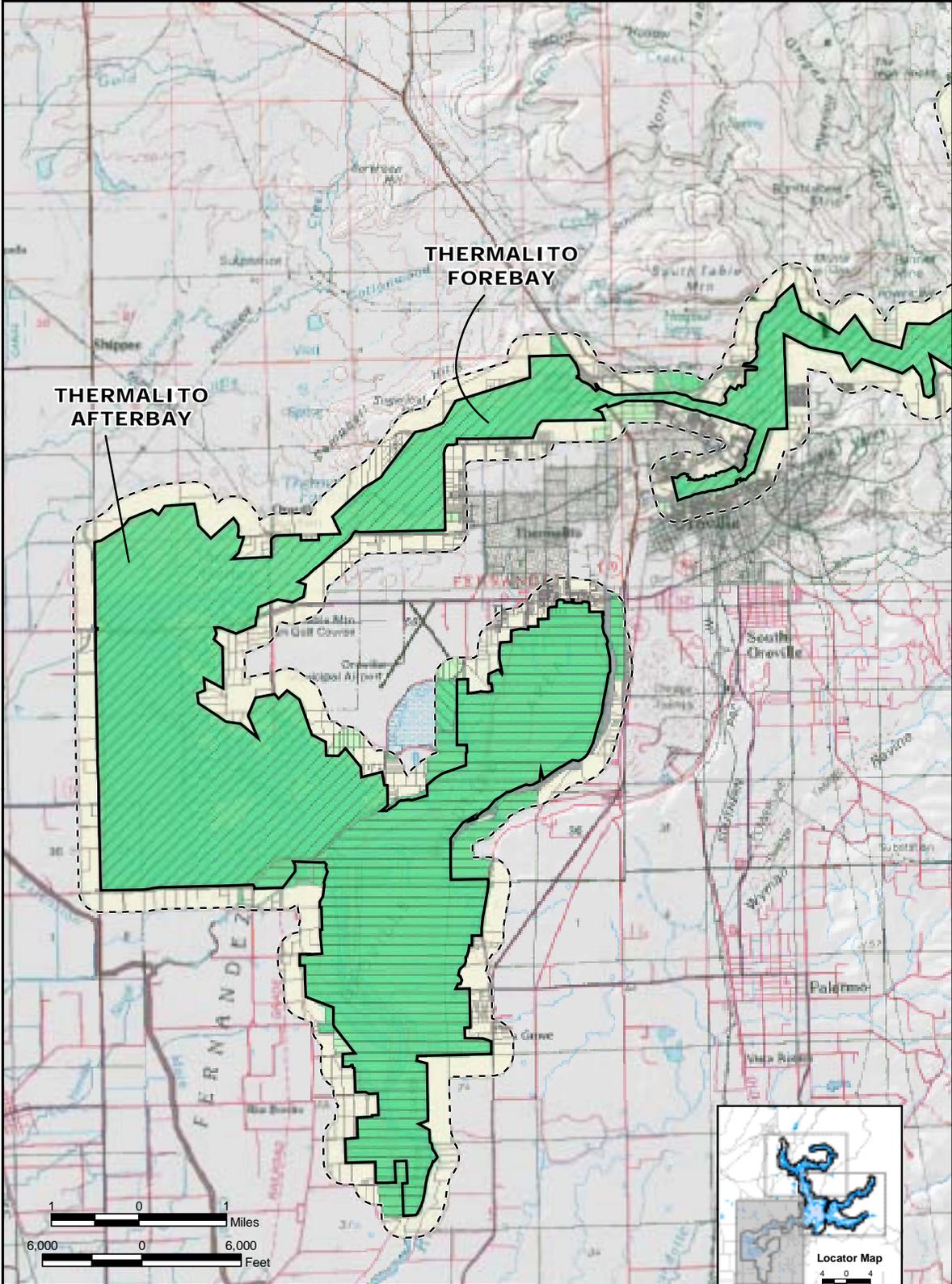
5.2.1.1 Federal

United States Forest Service (USFS)

The USFS administers and manages a number of land holdings in the study area. These lands consist of portions of two national forests, Plumas National Forest and Lassen National Forest, and are generally located along the eastern and northern reaches of Lake Oroville.

The Plumas National Forest contains approximately 1,400,000 acres and is located in Plumas, Lassen, Sierra, Butte, and Yuba Counties. Of this amount, roughly 1,170,000 acres are federally-owned and managed by the USFS. Plumas National Forest is organized into three distinct districts: Beckwourth Ranger District, Feather River Ranger

Insert Figure 5.2-1. Land Ownership



LEGEND

Federal		Local - Public	
	Bureau of Land Management (BLM)		Butte County
	U.S. Forest Service (Lassen NF)		City of Oroville
	U.S. Forest Service (Plumas NF)		Special Districts
	Bureau of Indian Affairs (BIA)		Feather River Recreation and Parks District
	Federal - Other	Private	
State			Private
	Department of Water Resources (DWR)*		Unknown/Other
	Department of Parks and Recreation (DPR)		FERC Boundary
	Department of Fish and Game (DFG)		FERC Study Area
	State of California - Other		

*Most land owned by DWR within the FERC boundary is managed by DPR as part of the LOSRA.

Sources: DWR 2003, BLM 2003, CDFG 2002, EDAW 2004

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

**Oroville Facilities Relicensing
FERC Project No. 2100**

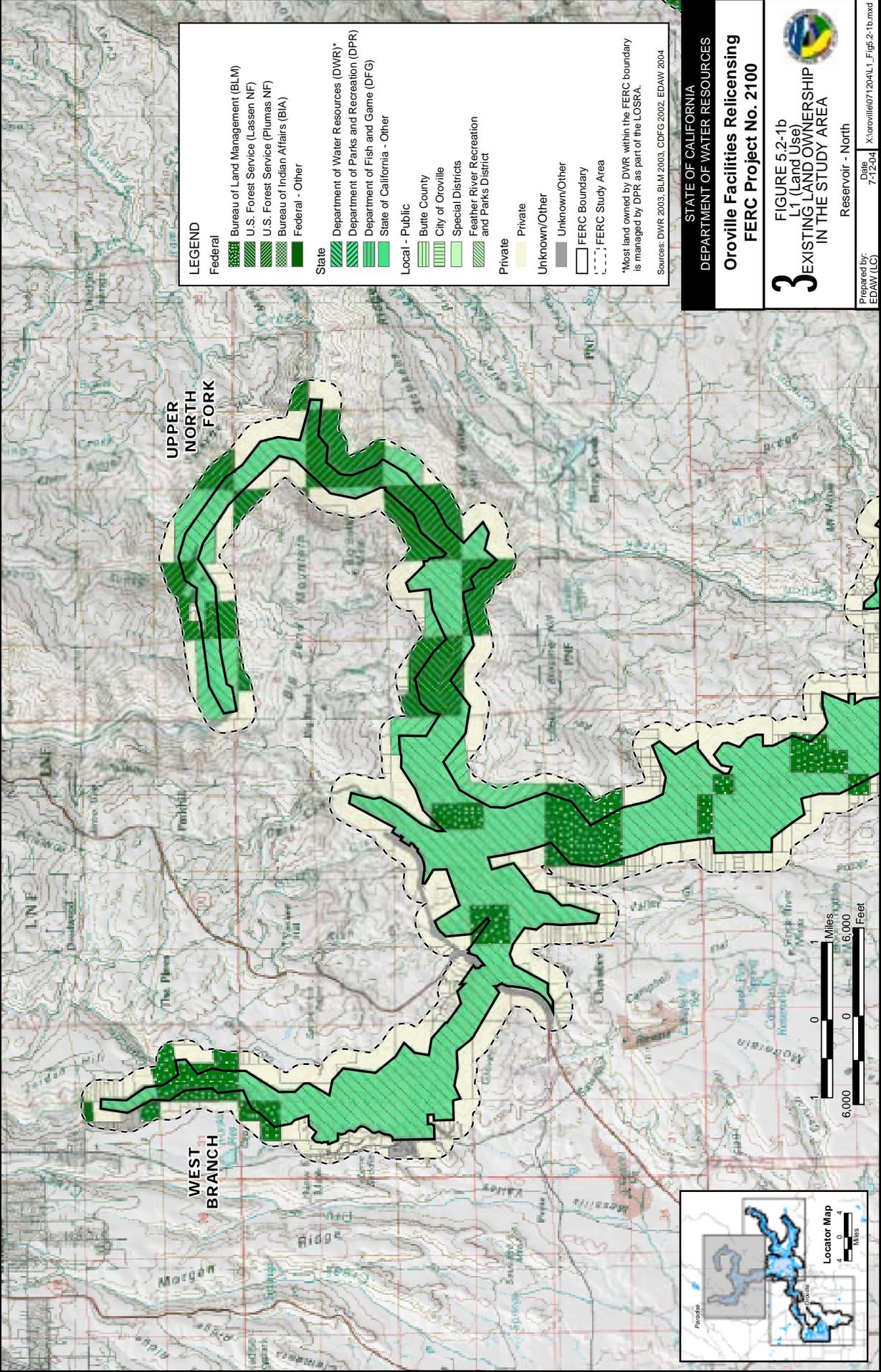
3 FIGURE 5.2-1a
L1 (Land Use)
EXISTING LAND OWNERSHIP
IN THE STUDY AREA
River - Below Oroville Dam



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Insert Figure 5.2-1b.



LEGEND

Federal

- Bureau of Land Management (BLM)
- U.S. Forest Service (Lassen NF)
- U.S. Forest Service (Plumas NF)
- Bureau of Indian Affairs (BIA)
- Federal - Other

State

- Department of Water Resources (DWR)*
- Department of Parks and Recreation (DPR)
- Department of Fish and Game (DFG)
- State of California - Other

Local - Public

- Butte County
- City of Oroville
- Special Districts
- Feather River Recreation and Parks District

Private

- Private
- Unknown/Other

Boundaries

- FERC Boundary
- FERC Study Area

*Most land owned by DWR within the FERC boundary is managed by DPR as part of the LOSRA.

Sources: DWR, 2003; BLM, 2003; CDFG, 2002; EDAW, 2004

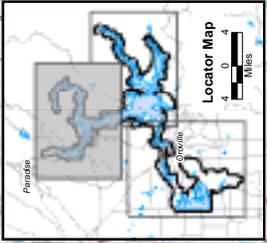
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Oroville Facilities Relicensing
FERC Project No. 2100

3 **FIGURE 5.2-1b**
L1 (Land Use)
EXISTING LAND OWNERSHIP
IN THE STUDY AREA

Reservoir - North

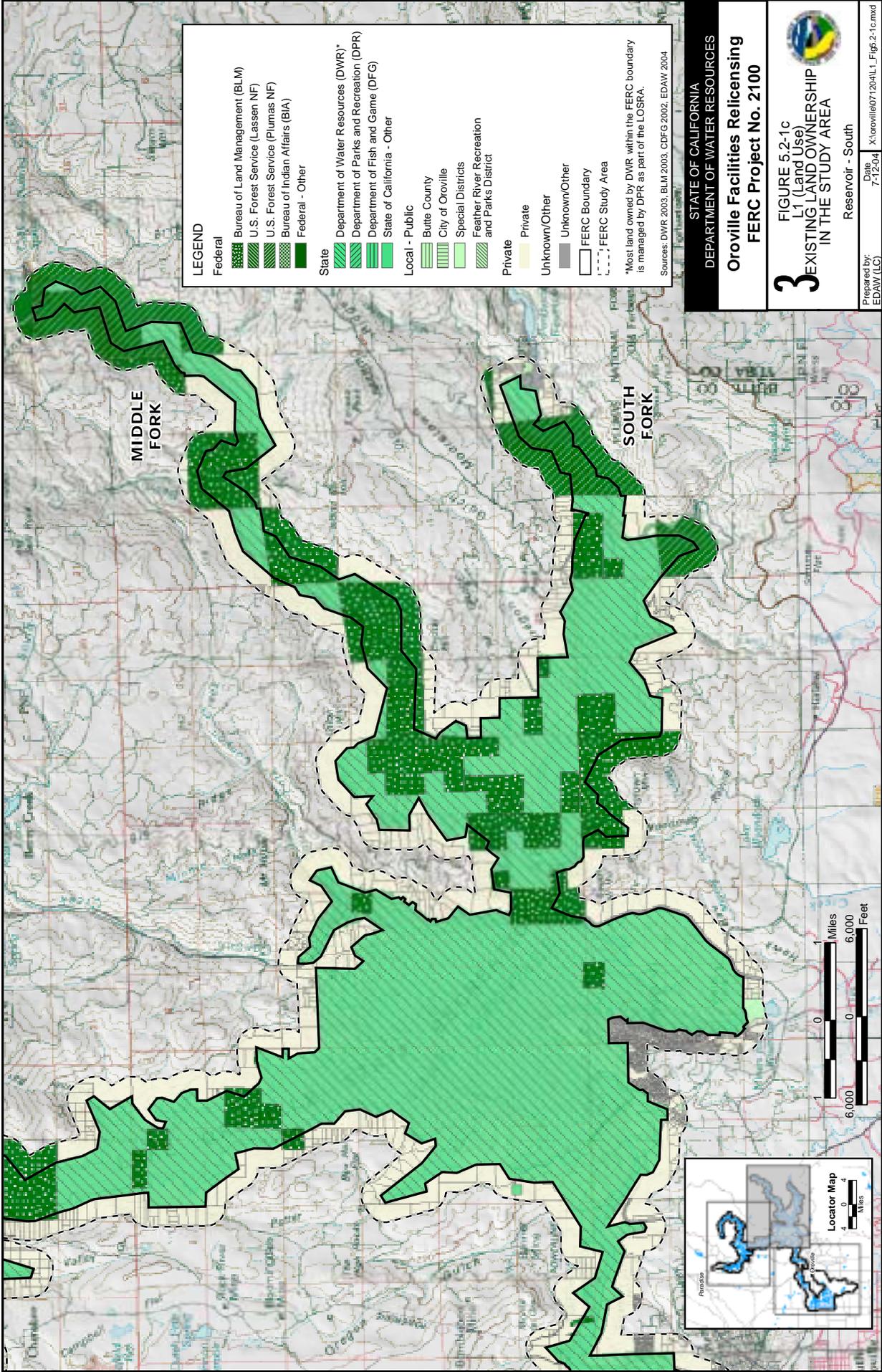
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 EDAW (LC)



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Insert Figure 5.2-1c.



LEGEND

Federal

- Bureau of Land Management (BLM)
- U.S. Forest Service (Lassen NF)
- U.S. Forest Service (Plumas NF)
- Bureau of Indian Affairs (BIA)
- Federal - Other

State

- Department of Water Resources (DWR)*
- Department of Parks and Recreation (DPR)
- Department of Fish and Game (DFG)
- State of California - Other

Local - Public

- Butte County
- City of Oroville
- Special Districts
- Feather River Recreation and Parks District

Private

- Private
- Unknown/Other

Boundary

- FERC Boundary
- FERC Study Area

*Most land owned by DWR within the FERC boundary is managed by DPR as part of the LOSRA.

Sources: DWR, 2003; BLM, 2003; CDFG, 2002; EDAW, 2004

STATE OF CALIFORNIA
 DEPARTMENT OF WATER RESOURCES
**Oroville Facilities Relicensing
 FERC Project No. 2100**

3 FIGURE 5.2-1c
 L1 (Land Use)
**EXISTING LAND OWNERSHIP
 IN THE STUDY AREA**

Reservoir - South

Date: 7-12-04
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Prepared by:
 EDAW/LC

Scale bars:

- Miles: 0, 4, 6,000
- Feet: 0, 6,000

Locator Map showing the study area within the Oroville Reservoir system.

Back of Figure 5.2-1c.

Table 5.2-1. Land ownership in the study area.

Landowner	Project boundary		Study area ¹	
	Acres ² (approx.)	Percent	Acres ² (approx.)	Percent
Public				
Federal				
U.S. Forest Service – Plumas NF	1,390	3.4%	3,630	5.1%
U.S. Forest Service – Lassen NF	230	0.6%	740	1.0%
BLM	4,620	11.2%	6,640	9.4%
BIA	0	0.0%	<10	<0.1%
Federal – Other	0	0.0%	290	0.4%
Sub-total: Federal	6,240	15.2%	11,300	16.0%
State				
DWR ³	29,240	71.1%	29,240	41.5%
DPR	0	0.0%	940	1.3%
DFG	5,660	13.7%	6,300	8.9%
State – Other	0	0.0%	410	0.6%
Sub-total: State	34,900	84.8%	36,890	52.3%
Local				
Butte County	0	0.0%	110	0.2%
City of Oroville	0	0.0%	150	0.2%
Feather River Recreation and Park District	0	0.0%	20	<0.1%
Other Local Districts/Agencies	0	0.0%	160	0.2%
Sub-total: Local	0	0.0%	440	0.7%
Sub-total: Public	41,140	100.0%	48,630	69.0%
Private	0	0.0%	20,700	29.3%
Other⁴	0	0.0%	1,200	1.7%
TOTAL⁵	41,140	100.0	70,530	100.0

¹One-quarter mile buffer of the Project boundary.

²Acres are approximate and rounded to the nearest 10. Acreage figures were based in part of assessor parcel data.

³Most land owned by DWR within the Project boundary is managed by DPR as part of the Lake Oroville State Recreation Area (LOSRA).

⁴Represents road right-of-way and public trust areas (e.g., river channel) without an official parcel number.

⁵Numbers and percentages may not add up to totals due to rounding

Source: EDAW 2004

District, and the Mt. Hough Ranger District. Plumas National Forest lands within the Project boundary are administered by the Feather River Ranger District, and are generally located in the eastern/northeastern reaches of the study area, with fragmented holdings distributed proportionately between the North, Middle, and South Forks of the Feather River. USFS lands adjacent to the Middle Fork portion of the study area encompass the western portion of the Middle Fork Feather Wild and Scenic River and the Feather Falls Scenic Area. Approximately 3,630 acres of Plumas National Forest land are located in the study area, constituting 7.5 percent of all public lands in the study area and 5.1 percent of the study area total. Management of these lands is based on the Plumas National Forest's Land and Resource Management Plan (LRMP),

Heger Feinstein Quincy Library Group Forest Recover Act Environmental Impact Statement (EIS), and the Sierra Nevada Framework Record of Decision (ROD).

Most of the Lassen National Forest is located north of the study area; however, some lands are located in the northern reaches of the study area near the North Fork Feather River tributary to Lake Oroville. These portions of the Lassen National Forest are managed by the Plumas National Forest under the management framework described above. Lassen National Forest lands within the study area total approximately 740 acres and account for 1.5 percent of public lands in the study area and 1.0 percent of the study area total.

Bureau of Land Management (BLM)

Federal lands owned/managed by BLM are scattered throughout the region, frequently in a checkerboard pattern. BLM-administered lands within the study area are found in the northern reaches of the West Branch Feather River, within the main body of the lake, and in the Middle and South Fork tributaries. In total, BLM owns approximately 6,640 acres of land in the study area, constituting 13.7 percent of public lands in the study area, 11.2 percent of lands within the Project boundary, and 9.4 percent of all lands within the study area. The general purpose of BLM management is “*to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.*” The Redding Field Office of the BLM is responsible for the administration of natural resources, lands, and mineral programs on approximately 250,000 of public lands in northern California, including lands within the study area. Management of BLM-administered public lands in the study area is directed by the BLM’s Redding Resource Management Plan (RMP), which covers the entire region.

Bureau of Indian Affairs (BIA)

The Bureau of Indian Affairs (BIA) also has jurisdiction over lands in the study area. . BIA lands typically consist of Native American reservations representing distinct Native American groups. Several reservations (or “rancherias”) exist in Butte County, including Berry Creek Rancheria, Chico Rancheria, Enterprise Rancheria, and Mooretown Rancheria. However, only Enterprise Rancheria is partially located within the study area (outside of the Project boundary) along the Middle Fork Feather River tributary. The Enterprise Rancheria consists of Maidu Indians with a tribal enrollment of 420 members. Only about 3 acres of the Enterprise Rancheria extend into the study area, constituting a negligible percentage of BIA land relative to public land and study area totals.

Federal – Other

Due to the nature of the mapping process in GIS, certain lands are classified as *Federal–Other*. These lands represent areas that are coded as federal lands in the Butte County parcel base, which does not track agency-level ownership information and are not covered by the agency-specific data sources. These areas are a product of

agency-specific data not completely matching the boundaries in the parcel data, thus resulting in small “sliver” polygons that cannot be attributed to a particular agency. These lands are located outside the Project boundary, and represent a minor percentage (approximately 0.4 percent) of the study area total.

5.2.1.2 State of California

California Department of Water Resources (DWR)

DWR is the owner, manager, and operator of the Oroville Facilities, which include all dams, powerhouses, and transmission facilities located within the Project boundary. Management of the Oroville Facilities is based on the terms of its existing FERC license. In terms of land ownership, DWR has control and possession for most State-held lands within the Project boundary, including a substantial amount of land underlying the reservoir²; however, recreational use of most of the Oroville Facilities is managed by the DPR. DWR’s Oroville Field Division office is the primary entity responsible for day-to-day operations (e.g., maintenance) at Lake Oroville. In total, DWR owns approximately 29,240 acres of land in study area, constituting 60.1 percent of public lands in the study area and 41.5 percent of the study area total. DWR ownership accounts for approximately 71.1 percent of lands within the Project boundary.

California Department of Parks and Recreation (DPR)

DPR does not hold fee-title ownership to any land within the Project boundary, and further, is limited in its fee-title ownership of lands in the study area. However, as the State’s primary recreation agency, DPR has primary recreational management responsibility for most of the land underlying and surrounding Lake Oroville and its facilities, as part of the Lake Oroville State Recreation Area (LOSRA); the extent of DPR’s management jurisdiction is described in more detail in Relicensing Study L-2 (Land Management). The LOSRA consists of major facilities at Loafer Creek, Bidwell Canyon, Spillway, Lime Saddle, Lake Oroville Visitors Center, and North and South Thermalito Forebay. DPR has fee-title ownership of approximately 940 acres of land in the study area (all of which is located outside of the Project boundary), constituting 1.9 percent of public land in the study area and 1.3 percent of the study area total. The Lake Oroville State Recreation Area Resource Management Plan/General Development Plan (1973) guides the management of the LOSRA.

California Department of Fish and Game (DFG)

DFG also owns and manages a significant amount of land in the study area, including lands within the Project boundary. In terms of ownership, DFG has control and possession over 6,300 acres in the study area (mainly part of the OWA), which

² For the purposes of this report, DWR is considered to own all State-lands within the Project boundary, but it is acknowledged that lands underlying road right-of-way within the Project boundary are held in fee by CalTrans or Butte County.

represents 13 percent of all public lands and 8.9 percent of the study area total. In terms of management, this agency plays a major management role in the Afterbay area (via easement) as well as the OWA. DFG implements its management plan for the OWA in coordination with DWR. Similarly, DFG has the primary management and operational responsibility for the Feather River Fish Hatchery, a facility that was cooperatively planned by DFG and DWR.

State – Other

There is a limited quantity of State-owned land in the study area where agency-level ownership information cannot be readily determined. These lands are located outside the Project boundary, and represent approximately 0.6 percent of the study area total.

5.2.1.3 Local

Butte County

All of the lands in the study area that are owned by Butte County are located outside the Project boundary. County-owned properties generally reflect administrative uses for government services. In total, the County owns approximately 110 acres of land, constituting 0.2 percent of public lands in the study area and 0.15 percent of the study area total.

City of Oroville

The City of Oroville owns a limited number of properties in the study area, all of which are located outside of the Project boundary. City-owned properties typically represent uses pertaining to government services and recreation. In total, the City owns roughly 150 acres of land, constituting 0.3 percent of public lands in the study area and 0.2 percent of the study area total.

Feather River Recreation and Park District (FRRPD)

Another local entity that owns and administers lands in the study area is the FRRPD, which was established in 1953 and provides a variety of park and recreational services to residents of southeast Butte County. Their holdings in the study area, which include Riverbend Park located west of Highway 70 at Montgomery Street, total roughly 20 acres (less than 0.1 percent of the study area). All of these holding are located outside of the Project boundary.

Other Local Districts/Agencies

On the local level, there also exists a set of quasi-public agencies, including local districts, that own property in the study area. Aside from the FRRPD described above, the following entities comprise this ownership category: San Joaquin Drainage District, County Board of Education, County Housing Authority, Thermalito Irrigation District,

Richvale Irrigation District, Oroville Area Public Utility District, Oroville Elementary School District, Oroville Union High School District, Thermalito Elementary School District, Biggs West Gridley Water District, Western Canal Water District, and Wyandotte Irrigation District. In total, local agencies and districts own approximately 160 acres of land in the study area, located entirely outside the Project boundary; this represents 0.2 percent of the study area total.

5.2.1.4 Private Lands

Although land in the study area is predominantly owned by public agencies (approximately 69 percent), private interests are also significant landowners, owning approximately 29.3 percent of lands in the study area. There are no private ownership interests within the Project boundary. However, one sizeable private landowner in the study area is the Pacific Gas & Electric Company (PG&E), which uses lands for utility purposes, such as transmission lines. In general, management of private lands must comply with current land use planning guidelines (i.e., general plans) and regulations (i.e., zoning ordinances).

5.2.1.5 Other

The remaining lands in the study area are either State or County road rights-of-way or areas without an official parcel number, which are often attributed to public trust lands, such as the river channel, that are not owned by any one entity. Because these lands do not provide pertinent ownership information, they have been classified as *Other*. There are approximately 1,200 acres of *Other*-owned land, representing 1.7 percent of the study area total.

5.2.2 Land Ownership Patterns in the Study Area

Land ownership in the study area is diverse, as illustrated by the multiple public land owners/managers described above. In addition, there are substantial private property interests that are located outside, but adjacent to, the Project boundary. Land ownership patterns vary throughout the study area as well. The following is a discussion of general land ownership patterns throughout the study area by sub-areas (Lake Oroville, the Thermalito Forebay and Diversion Pool, the Thermalito Afterbay, and the LFC).

5.2.2.1 Lake Oroville

Ownership patterns in the Lake Oroville sub-area vary based on location. Lands underlying and adjacent to the main body of Lake Oroville are primarily owned by DWR, but managed by DPR as part of the LOSRA. In addition, there are several federal parcels representing BLM- and USFS-administered properties that are interspersed throughout the main reservoir area. Generally, land located around the lake and outside of the Project boundary, but within the study area, is owned predominantly by private interests with limited public land holdings. The West Branch Feather River area

is characterized by a relatively large amount of BLM land. The ownership pattern in the North Fork Feather River area is the most diverse in the study area, and is characterized by blocks of discontinuous properties owned/managed by DWR, USFS (both Plumas and Lassen National Forest), DPR, and private interests. The Middle Fork and South Fork Feather River areas have similar ownership characteristics containing a mix of DWR, BLM, USFS, and private land owners/managers. A small portion of the only BIA-administered property (Enterprise Rancheria) is located along the Middle Fork Feather River tributary (outside of the Project boundary).

5.2.2.2 Thermalito Forebay and Diversion Pool

The Diversion Pool and Thermalito Forebay area also contain a range of land owners/managers, including BLM, DWR, DFG, DPR, Butte County, City of Oroville, and private interests. Public ownership in this segment tends to be at the State and local level, with only several small BLM properties located west of Oroville Dam. DWR is the primary land owner in this sub-area, administering land underlying the Diversion Pool and the Forebay, which is managed by DPR as part of the LOSRA. This sub-area also contains the majority of the City- and County-owned property in the study area. City properties are located along Montgomery Street within the city limits of Oroville; these properties are located outside of the Project boundary. A cluster of County-owned properties is located just east of Thermalito Forebay, south of the Project boundary. In this sub-area, private interests own the majority of the land outside of the Project boundary that is within the study area.

5.2.2.3 Thermalito Afterbay

Ownership in the Thermalito Afterbay area is relatively uniform. The State (under DWR administration) is the primary landowner in this sub-area, owning lands underlying the Afterbay as part of the OWA (which is managed by DFG). Outside the Project boundary, land adjacent to the Thermalito Afterbay is owned primarily by private interests with the exception of small clusters of City- and State-owned properties located north and south of the Project boundary, respectively.

5.2.2.4 Oroville Wildlife Area (OWA)

The OWA is also the primary feature of the OWA sub-area. Those portions of the OWA within the Project boundary are owned by the State (under DFG administration and management). Lands in the OWA area that are located outside of the Project boundary are owned/managed by various entities, including DFG, DPR, Butte County, the City of Oroville, and private interests.

5.3 EXISTING LAND USE

The discussion of existing land use in the study area consists of two parts. The first part describes the types (or classifications) of land uses currently found in the study area,

while the second part provides spatial information on the types of land uses found in the four study sub-areas.

5.3.1 Land Use Classifications

Existing land use within the study area was organized into eight major land use classifications:

- € *Urban*, which includes Residential, Commercial/Industrial, Project Facilities, and Other Urban sub-classifications;
- € *Rural*, which includes Rural Residential and Agriculture sub-classifications;
- € *Conservation*;
- € *Recreation*;
- € *Resource Extraction*;
- € *Undeveloped/Habitat*;
- € *Other*; and
- € *Reservoir/Open Water*.

For information on the methodology used to develop this land use classification system, please refer to Section 4.2.2 of this report. The land use classifications used in this report are described in detail below, and Table 5.3-1 summarizes the amount (and percentage) of the various land uses within the Project boundary and in the study area. Figures 5.3-1a, 5.3-1b, and 5.3-1c illustrate land use patterns in the study area.

5.3.1.1 Urban Land Uses

Urban land uses refer to areas that have been developed for residential, industrial, and commercial uses, facilities associated with Project operations, and other general urban-type uses. Urban land uses represent approximately 2,300 acres, or 3.2 percent of the study area, and 490 acres, or 1.2 percent, of lands within the Project boundary. The predominant type of urban land use in the study area is *Residential*, which accounts for 48.7 percent of the *Urban* land use sub-total. All other urban-type uses (i.e., *Commercial/Industrial*, *Project Facilities*, and *Other Urban*) are also represented in the study area; however, in aggregate, they only account for roughly 1.7 percent of the study area total.

Residential

The *Residential* land use sub-classification represents areas containing single and multiple family housing units, located in developed communities. Generally, residential development in the study area is not extensive and is concentrated in the area outside

Table 5.3-1. Land uses in the study area.

Land Use	Project boundary		Study area ¹	
	Acres ² (approx.)	Percent	Acres ² (approx.)	Percent
Urban				
Residential	0	0.0%	1,120	1.6%
Commercial/Industrial	0	0.0%	100	0.1%
Project Facilities	410	1.0%	670	0.9%
Other Urban	80	0.2%	410	0.6%
Sub-total: Urban	490	1.2%	2,300	3.2%
Rural				
Rural Residential	0	0.0%	400	0.6%
Agriculture	10	<0.1%	2,180	3.1%
Sub-total: Rural	10	<0.1%	2,580	3.7%
Recreation	12,770	31.0%	13,850	19.7%
Conservation	7,400	18.0%	12,330	17.5%
Resource Extraction	210	0.5%	670	0.9%
Undeveloped/Habitat	1,060	2.6%	18,690	26.5%
Other	170	0.4%	690	1.0%
Reservoir/Open Water³	19,030	46.3%	19,420	27.5%
TOTAL⁴	41,140	100.0%	70,530	100.0%

¹ Includes the Project boundary and non-Project lands adjacent to and within ¼ mile of the Project boundary..

² Acres are approximate and rounded to the nearest 10.

³ Measured at full pool elevation.

⁴ Numbers may not add up to 100 percent due to rounding.

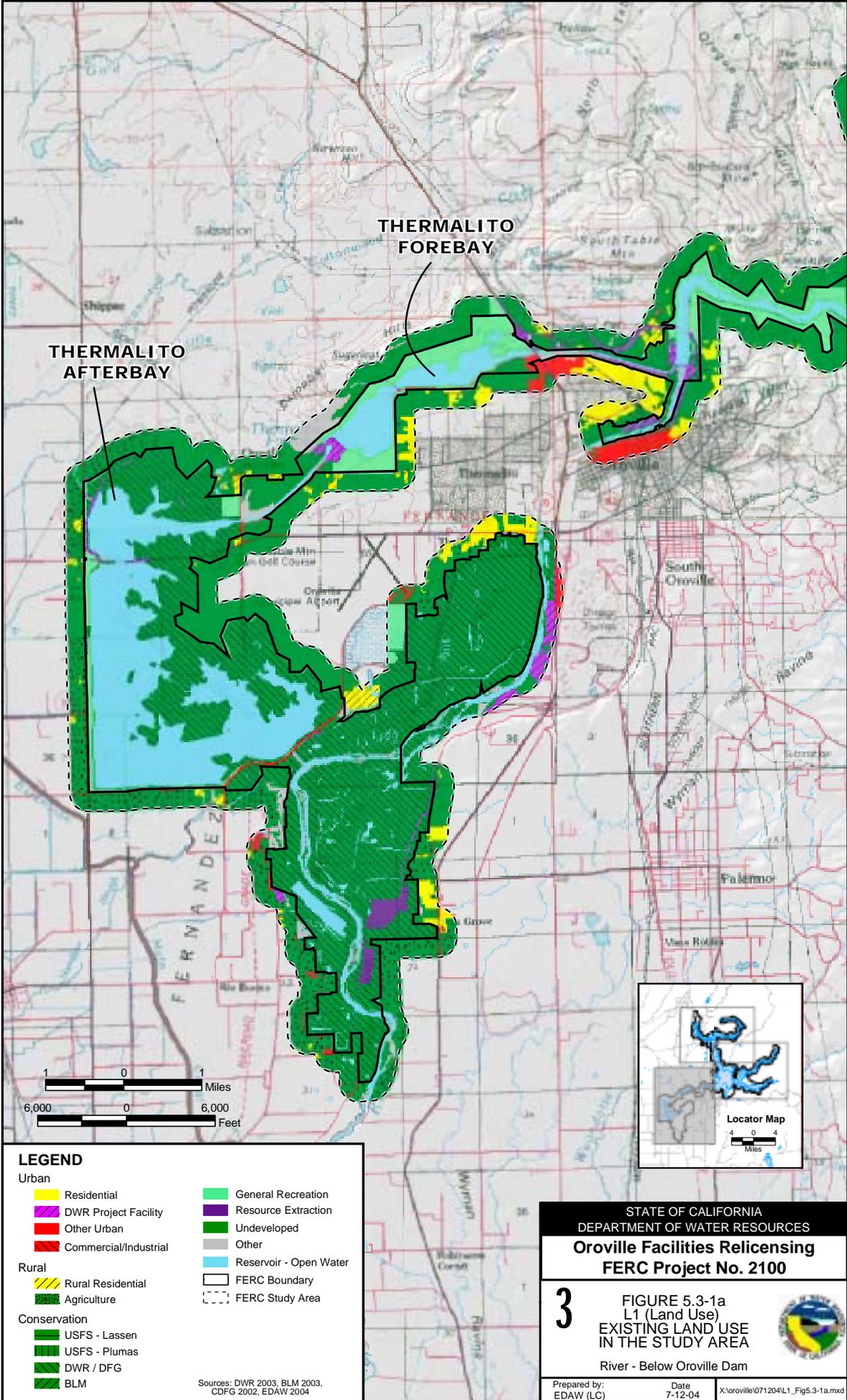
Source: EDAW 2004

the Project boundary. Only one residential community, Kelly Ridge, is located adjacent to the Project boundary. The Kelly Ridge community is located just east of Oroville Dam, on the north end of the Bidwell Canyon area. Other residential uses are dispersed throughout study area (see section 5.3.1.2 for a discussion on rural residential land uses). In total, the area associated with the *Residential* land use category is approximately 1,120 acres, or 1.6 percent of the study area. There are no residential uses in the Project boundary.

Commercial/Industrial

The *Commercial/Industrial* land use sub-classification refers to areas providing commercial services in the study area (e.g., offices, retail shops, hotels/motels, private campgrounds, etc.) and industrial development (e.g., manufacturing, plants/mills, extractive industries, etc.); it does not include commercial marina concessionaire establishments which are classified as *Recreation*. Commercial and industrial development in the study area is limited, accounting for only 100 acres or 0.1 percent of the study area. No commercial or industrial development (outside of Project Facilities) is located within the Project boundary. Outside the Project boundary, the main area of commercial development is located on the south side of the Thermalito Diversion Canal,

Insert Figure 5.3-1a. Land Use.



Back of Figure 5.3-1a. Land Use.

Insert Figure 5.3-1b.

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Insert Figure 5.3-1c.

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along Montgomery Street, in the City of Oroville, and industrial uses are concentrated in the area along Highway 70 in the Bypass Reach.

Project Facilities

The *Project Facilities* sub-classification refers to areas located within the Project boundary that are directly associated with the operation of the Oroville complex. Project facilities are mainly industrial in nature and consist of Oroville Dam, three power plants (Edward Hyatt Power Plant, Thermalito Diversion Dam Power Plant, and Thermalito Pumping-Generating Plant), Thermalito Diversion Dam, the Fish Barrier Dam, and the Feather River Fish Hatchery (see Section 1.3, Description of Facilities). This classification also includes associated facilities, such as maintenance yards and staging and parking areas; the DWR headquarters facility is located outside the Project boundary and study area. The area classified as Project Facilities is roughly 670 acres, or 0.9 percent of the study area. Of this, roughly 410 acres is located within the Project boundary, accounting for 1.0 percent of the Project boundary area.

Other Urban

The *Other Urban* sub-classification represents areas that are urban in nature, but do not fit into the urban classifications described above. These are areas that are heavily disturbed and are characterized by structures, paved ground cover, and limited non-native planted vegetation. The predominant *Other Urban* land use is the roadway network serving the study area. The area associated with the *Other Urban* classification is 410 acres, or 0.6 percent of the study area. Significantly less *Other Urban* land uses are located within the Project boundary, only 80 acres (0.2 percent).

5.3.1.2 Rural Land Uses

The majority of the study area is considered rural in nature, which means it is being used for rural residential or agricultural purposes. The total area of *Rural* land uses is roughly 2,580 acres, or 3.7 percent of the study area. Within the Project boundary, rural uses account for only 10 acres, or less than 0.1 percent of the Project boundary area.

Rural Residential

Rural Residential land uses represent single family homes and farm buildings located outside of developed communities, and are generally large isolated parcels of land surrounded by agricultural fields or grasslands. The area associated with the *Rural Residential* classification is 400 acres, or 0.6 percent of the study area. There are no residential uses in the Project boundary.

Agriculture

Agricultural land uses refer to a conglomeration of several, more specifically defined, agriculture-related uses. These uses include fallow fields, hayfields, orchards, pastures,

rice, row crops, and vineyards. In the study area, agricultural land use is concentrated in the Thermalito Afterbay and Bypass Reach areas. Overall, lands classified as *Agriculture* lands account for roughly 2,180 acres, or 3.1 percent of the study area. Agricultural uses are much less pronounced within the Project boundary, only about 10 acres, or less than 0.1 percent of the Project boundary area.

5.3.1.3 Recreation

Recreation is an important and extensive land use in the study area, and is predominantly concentrated within the Project boundary. The *Recreation* land use classification is composed primarily of the land area in the LOSRA, which is a State Park unit administered by DPR³. For the purposes of the analysis, no distinction has been made between recreation lands with developed facilities and lands providing more dispersed recreational opportunities. The prominent recreational areas of the LOSRA include Loafer Creek, Bidwell Canyon, Spillway, Lime Saddle, Lake Oroville Visitors Center, and North and South Thermalito Forebay. In addition, DPR administers and manages the Clay Pit SVRA, which is located outside the LOSRA and FERC Project boundary, but within the study area. Other areas that are classified as *Recreation* outside the LOSRA and FERC Project boundary include the Rabe Road Shooting Area, which is managed by DFG. It should be noted that other land uses, including cattle grazing, has been allowed on lands within the LOSRA as authorized by lease agreements between DWR and private interests. In aggregate, *Recreation* land in the study area covers roughly 13,850 acres, or 19.7 percent of the study area total. Within the Project boundary, recreation lands account for 12,770 acres, or 31 percent of the Project boundary area.

5.3.1.4 Conservation

Lands classified as *Conservation* are administered by public agencies that have a mandate for managing and protecting wildlife, fisheries and/or their habitats. While other uses may occur on these lands, the conservation of natural resources is clearly the overriding management direction on these lands. For the purposes of this study, public lands that have conservation management mandates include lands administered by the USFS, DFG, and BLM, that are not otherwise specifically managed for other uses (such as timber harvest on USFS lands). Lands classified as *Conservation* account for 12,330 acres, or 17.5 percent of the study area. Lands classified as *Conservation* account for 7,400 acres, or 18.0 percent of the area within the FERC boundary.

5.3.1.5 Resource Extraction

There are lands within the study area that have been classified as *Resource Extraction*. These lands represent areas identified by the USFS in the Plumas National Forest LRMP as areas subject to timber harvest, as well as active gravel mining operations

³ Recreation uses also occur in other areas of the study area, such as the OWA. However, because the OWA is managed primarily under conservation-oriented mandates, it is classified as having a Conservation land use.

located primarily within the OWA per lease agreements with DWR. The area associated with *Resource Extraction* use is 670 acres, or 0.9 percent of the study area. Resource extraction uses within the Project boundary are less pronounced, accounting for 210 acres, or 0.5 percent of the Project boundary area.

5.3.1.6 *Undeveloped/Habitat*

The *Undeveloped/Habitat* land use classification refers to undeveloped land located outside of urban areas that contain native vegetative cover. These lands have not been identified by their managing entities as being managed for conservation purposes, but due to their largely undeveloped nature, provide habitat value. Lands classified as *Undeveloped/Habitat* are the most prevalent land use classification in the study area, especially in the area outside the Project boundary surrounding Lake Oroville. This classification applies to nearly 18,690 acres, or 26.5 percent of the study area. Within the Project boundary, approximately 1,060 acres or 2.6 percent of the land has been classified as *Undeveloped/Habitat*. From a habitat perspective, this number is somewhat misleading. Much of the land within the Project boundary is contained within the LOSRA and was classified as *Recreation*. Although classified as *Recreation*, much of the LOSRA is undeveloped and in addition to providing dispersed recreation, it provides valuable habitat.

5.3.1.7 *Other*

The *Other* land use classification includes lands that do not fit in the land use classifications described above, and include uses such as disturbed lands, gravel tailings, and rock outcrops. The area associated with these *Other* uses is 690 acres, or 1.0 percent of the study area. In terms of the Project boundary, *Other* uses account for 170 acres, or 0.4 percent of the Project boundary area.

5.3.1.8 *Reservoir/Open Water*

The *Reservoir/Open Water* classification refers to all water features in the study area (e.g., lakes, reservoirs, rivers, canals, etc.). Major water features in the study area include Lake Oroville, the Thermalito Power Canal, Thermalito Forebay, and Thermalito Afterbay. In terms of size, this land use classification is substantial, covering approximately 19,420 acres (measured at full pool elevation), or 27.5 percent of the study area, and 46.3 percent of the area within the Project boundary.

5.3.2 Existing Land Use Patterns in the Study Area

The extent of distinct land use types in the study area is important; however, the spatial distribution of land use provides a better context against which to evaluate land use issues. The following discussion characterizes existing land use in each of the four study sub-areas evaluated in this report.

5.3.2.1 Lake Oroville

The Lake Oroville sub-area includes the reservoir and Feather River tributaries. Lake Oroville covers approximately 15,800 surface acres and can store up to roughly 3.54 million acre-feet of water at capacity when the lake level is 900 feet above sea level (DWR 2001). Although Lake Oroville is classified as *Reservoir/Open Water* under the land use classifications used in this report, the reservoir's primary purpose is water supply serving the SWP; secondary uses include power generation, flood control, recreation, and fishery/wildlife habitat enhancement (DWR 2001). For the most part, land immediately adjacent to the lake is contained within the LOSRA and is managed by DPR for recreational purposes. These lands include various developed facilities such as marinas, campgrounds, boat launches, as well as undeveloped areas that are open to the public for dispersed recreational use. The only notable urban use in this sub-area is the Kelly Ridge residential development located adjacent to the Project boundary. Kelly Ridge is located on south side of the reservoir, just east of Oroville Dam. *Resource Extraction* use is allowed on portions of USFS lands located along the North and South Fork Feather River tributaries. The remainder of this sub-area is primarily used for *Undeveloped/Habitat* and *Conservation* uses, with isolated *Rural* uses dispersed through this area.

5.3.2.2 Thermalito Forebay and Diversion Pool

The Thermalito Forebay and Diversion Pool area is particularly diverse in terms of land use. This sub-area is bisected by Highway 70, which separates the Diversion Pool area to the east and the Thermalito Forebay area to the west. Other transportation infrastructure includes the Union Pacific Railroad and numerous city/county roadways. The two water features, Diversion Pool and Thermalito Forebay represent a significant land use and are classified as *Reservoir/Open Water*.

For the most part, the *Recreation* classification surrounds these water features, and includes the North and South Forebay recreation sites. Areas classified as *Residential* are located primarily west of the dam in the City of Oroville. Similarly, a range of *Commercial/Industrial* lands are found in the Oroville area along the low-flow channel of the Feather River. The majority of the Oroville Project Facilities are located in this sub-area, including the Oroville Dam, Edward Hyatt Power Plant, Palermo Canal Outlet Tunnel, Thermalito Diversion Dam, Feather River Fish Barrier Dam, Feather River Fish Hatchery, and the Thermalito Forebay Dam and Power Plant. In terms of rural land uses, several pockets of land classified as *Agriculture* are found interspersed in this area along with areas of *Undeveloped/Habitat* outside the Project boundary.

5.3.2.3 Thermalito Afterbay

The Thermalito Afterbay sub-area is the most uniform in terms of land use. This area is characterized primarily by the *Reservoir/Open Water* and *Conservation* classifications within the Project boundary, and *Undeveloped/Habitat* and *Agriculture* classifications outside the Project boundary (but within the study area). The *Reservoir/Open Water*

classification reflects the Thermalito Afterbay, and the *Conservation* classification represents the fact that this area is managed by DFG as part of the OWA. Outside the Project boundary, *Agriculture*-based lands are concentrated west of Highway 99 and south of Hamilton Road. Land use features that are located in this sub-area include several brood ponds, a shooting range, model airplane club, the Western Canal & Richvale Canal Outlet, Sutter Butte Canal Outlet and River Outlet, as well as several recreation sites, including the Monument Hill, Wilbur Road, and Larkin Road recreation facilities. The Oroville Municipal Airport is located northeast of the Thermalito Afterbay sub-area, outside the Project and study area boundaries.

5.3.2.4 Oroville Wildlife Area (OWA)

The eastern part of the OWA is located predominantly within the Project boundary. Due to DFG management of the OWA, most land within this sub-area has been classified *Conservation*. However, it is acknowledged that recreation use of the OWA (which includes the Rabe Road Shooting Area) is considerable, with an emphasis on hunting and fishing activities. Other recreation uses in this area include the Clay Pit SVRA. In addition, there are active gravel mining and rock removal operations to the west of Highway 70 (within the OWA) that are operated by private interests under lease to DWR. According to DWR lease records, the area associated with gravel mining and rock removal operations within the OWA total approximately 160 acres (DWR 2003). Lands in this sub-area that are located outside the Project boundary are diverse in terms of land use: *Residential* areas located north of the OWA along Highway 162 and to the east of the OWA near Palermo Road, *Commercial/Industrial* areas located along Feather River Boulevard, *Agriculture* areas that surround the lower half of the OWA outside the Project boundary, and *Undeveloped/Habitat* areas interspersed within and around the OWA.

5.4 FUTURE LAND USE DIRECTION

Although it is important to understand what land uses currently exist in the study area, it is equally important to understand the direction of future land use as prescribed by the various land management entities. This direction is based on the types of allowable land uses that are contained in land use plans (i.e., general plans) administered by local jurisdictions. For the purposes of this report, the discussion of future land use direction will be limited to general patterns of land uses as prescribed in the Butte County General Plan. The General Plan assigns land use designations to federal, State and private lands, although the County only has jurisdiction over private lands that include unincorporated as well as incorporated areas of the County. For incorporated areas, such as the City of Oroville, the County and City general plans are designed to be consistent with one another. Figures 5.4-1a, 5.4-1b, and 5.4-1c illustrate the Butte County General Plan land use designations for the study area.

5.4.1 General Plan Land Use Designations

The following Butte County General Plan land use designations (with a description of primary land uses) are located in the study area:

- € **Orchard and Field Crops (OFC):** Cultivation, harvest, storage, processing, sale, and distribution of all plant crops, especially annual food crops;
- € **Grazing and Open Land (GOL):** Livestock grazing, animal husbandry, intensive animal uses, and animal matter processing;
- € **Timber-Mountain (TM):** Forest management and the harvesting and processing of forest products;
- € **Agricultural Residential (AR):** Agricultural uses and single-family dwellings at rural densities;
- € **Foothill Area Residential (FAR):** Single-family dwellings at rural densities;
- € **Low Density Residential (LDR):** Detached single-family dwellings at urban densities;
- € **Medium Density Residential (MDR):** A mixture of urban residential uses, including detached single-family homes, condominiums, multiple-dwelling structures, mobile home parks, group quarters, and care homes;
- € **High Density Residential (HDR):** Higher-density urban residential uses, including condominiums, multiple-dwelling structures, mobile home parks, group quarters, and care homes;
- € **Commercial (C):** Structures and activities providing a full range of merchandise and services to the general public;
- € **Industrial (I):** Processing, manufacturing, packaging, storage, and distribution of goods and commodities; and
- € **Public (P):** Large facilities owned and operated by government agencies, including schools, colleges, airports, dams and reservoirs, disposal sites, recreation facilities, conservation areas, fire stations, and other government buildings and property.

Although *Research and Business Park* and *Sports and Entertainment* land use designations are included in the County General Plan, these planned land uses are not found in the study area.

5.4.2 Future Land Use Direction Patterns within the Study Area

Similar to the discussion regarding existing land use and ownership patterns described above, it is also important to understand the spatial distribution of future allowable land uses in the study area. The following discussion characterizes allowable land uses, according to the Butte County General Plan, within the four sub-areas evaluated in this report.

Insert Figure 5.4-1a. Future Land Use Direction.

Back of Figure 5.4-1a.