Abstract: SP-L1 - Land Use

Type of Study: ● Desktop Study ○ Field Study

Start Date: Winter 2002

Need for Study: FERC relicensing regulations require that applicants prepare a report on lands in order to determine Project conformance and compatibility with local and regional land uses and land plans.

Objective: The objective of this study is to determine and describe existing and planned future land uses within and adjacent to the Project boundary, and to identify potential land use conflicts, compatibilities and opportunities related to Project facilities, operations.

Scope/Methodology/Results: The land use study will examine lands within the Oroville Facilities Project boundary, contiguous properties and other lands within ¼ mile of the Project boundary. The methodology for the study will involve an initial data collection effort comprised of a literature review and interviews to develop an existing conditions inventory. Information from maps will be compiled with collected data and analyzed. An opportunities and constraints analysis will be performed to identify any potential conflicts related to land uses as well as potential areas for collaboration. Recommendations for future policies and actions for land uses within the Project boundary will be developed. A land use report will present findings and recommendations and will include a series of land use maps generated from the land use GIS database that will be developed.

Abstract: SP-L2 - Land Management

Type of Study: ● Desktop Study ○ Field Study

Start Date: Winter 2002

Need for Study: Land within the Oroville Facilities Project boundary and contiguous properties have a variety of managing entities responsible for existing and future land use and management. As part of FERC's required report on lands, it is necessary to identify these land management entities and the management objectives for the lands they manage.

Objective: The objective of this study is to determine what entities manage the lands adjacent to and near the project, the land management objectives for these lands and how the management of those lands influences Project facilities and operations and vise versa.

Scope/Methodology/Results: The study scope includes lands within the Oroville Facilities Project boundary, contiguous properties and other lands within ¼ mile of the Project boundaries. The study will identify the entities that currently have land management responsibilities and assess their land management plans and objectives. A general overview analysis of land use patterns, trends, consistency, opportunities and constraints in the study area will also be conducted. These tasks will involve literature reviews, interviews, mapping and data analysis. The results of the study will be described in a land management report which will include a summary of the current land management environment and GIS-generated maps documenting ownership, management objectives, etc.

Abstract: SP-L3 – Comprehensive Plan Consistency

Type of Study: ● Desktop Study ○ Field Study

Start Date: Winter 2002

Need for Study: FERC relicensing regulations require that applicants prepare a report that identifies all relevant comprehensive and land management plans and discusses the Project's consistency or lack of consistency with each plan.

Objective: The objective of this study is to describe existing comprehensive and management plans compared to existing and planned future land uses within and adjacent to the Project boundary and to determine Project consistency.

The scope of this study includes all plans that manage or address lands within the Oroville Facilities FERC Project boundary, contiguous properties, and other lands within ¼ mile of the Project boundary. This study will consist of two phases: 1) a review and summary of existing comprehensive and land management plans that potentially influence, or are potentially influenced by the Project and 2) a determination of consistency. A report will be produced that describes examined plans and discuss Project consistency with those plans.

Abstract: SP-L4 -- Aesthetics

Type of Study: ○ Desktop Study ● Field Study

Start Date: Spring 2002

Need for Study: FERC requires an applicant to assess how a relicensed Project will affect the aesthetic quality of the area in which the Project is located.

Objective: The objectives of this study are to inventory and characterize the existing aesthetic quality of the Project area, assess the level of contrast and compatibility of existing Project features with the Project's aesthetic setting, and evaluate the degree to which proposed protection, mitigation and enhancement measures would affect the aesthetic quality of the Project area.

Scope/Methodology/Results: The scope includes the area within the Oroville Project boundary. Working with several work groups and agency staff, key observation points (KOP's) will be identified to represent various views that occur around the Project facilities. Field reconnaissance will verify the appropriateness of the KOPs at both high- and low-water pool elevations. Visibility of Project and non-Project features that influence visual quality will be documented and analyzed to describe existing aesthetic conditions and to evaluate the aesthetic effects from potential protection, mitigation and enhancement measures. In addition, an aesthetic opportunity and constraints analysis will be conducted. The results will be presented in an aesthetic resource report and will include photographs from KOPs and GIS based maps and graphics.

Abstract: SP-L5 – Fuel Load Management Evaluation

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: CEQA requires evaluation of potential project impacts related to safety including increased risk of wildfire. Stakeholders have expressed concern that historic land management and fire prevention activities within the FERC Project boundary have resulted in increased fuel loading.

Objective: The objectives of this study are to determine fuel loads within the Project boundary, evaluate methods to reduce fuel loading and their effects on other resources, and recommend fuel load management and reduction techniques.

Scope/Methodology/Results: The study scope includes the area within the FERC Project boundary, contiguous properties and lands within ¼ mile of the Project boundary. This study will assess current fuel loads within and adjacent to the Project boundary, examine successful fuel load management and reduction programs elsewhere, incorporate information developed from SP-T11, Fire Prevention/Fuel Load Control, regarding effects of fuel loading and management options on plant communities and wildlife habitats, and develop recommendations for techniques or programs appropriate to the Project lands.

Abstract: SP-R1 – Public and Private Vehicular Access

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC guidelines direct the licensee to provide adequate public access to recreation facilities and Project waters. This study is needed to determine if the Oroville Facilities meet FERC direction to ensure public access.

Objective: The objective of this study is to identify the opportunities for and constraints to public and private vehicular access to Project land and water resources.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will involve a quantitative and qualitative assessment of current public access and future development effects on public access through the next license period. The study will identify the current condition of vehicular access and determine if it poses a barrier to recreation visits in the Project area. Results will include recommendations to improve or change access for current and future recreation demand.

Abstract: SP-R2 – Recreation Safety Assessment

Type of Study: ● Desktop Study ○ Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities. This study is needed to meet FERC direction for preparing the portion of a Comprehensive Recreation Plan that addresses significant safety issues and concerns. FERC regulations require that licensees operate their projects for protection of life, health, and property.

Objective: The objectives of this study are to identify recreation safety issues and concerns, assess current and historic recreation-related safety incidents and trends, and evaluate recreation safety-related management policies and procedures.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will involve a quantitative and qualitative assessment of recreation public safety in the study area and develop a set of recommendations. The study will utilize data collected from SP-R7, Reservoir Boating Study and SP-R13, Recreation Surveys as well as research on recreation facility regulations and enforcement issues, local health/injury issues, and fire issues to develop appropriate action considerations for incorporation into the Comprehensive Recreation Plan.

Abstract: SP-R3 – Assess Relationship of Project Operations and Recreation

Type of Study: ● Desktop Study ○ Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities. This study is needed to address the relationship between Project operations and recreation.

Objective: The objective of this study is to determine the effects of current operations and any proposed changes to those operations on recreational use and visitor experience at Project facilities.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will involve a quantitative and qualitative assessment of the effects project operations have on recreational resources and activities at Project facilities. The study will utilize data collected from SP-R7, Reservoir Boating Study, SP-R9, Existing Recreation Use and SP-R13, Recreation Surveys as well as research from Engineering and Operations studies to describe operational effects and assess how various potential operating scenarios may affect recreation. Results will be used to develop protection, mitigation, and enhancement measures for facilities or areas adversely affected by Project operations.

Abstract: SP-R4 – Assess Relationship of Fish/Wildlife Management and Recreation

Type of Study: ● Desktop Study ○ Field Study

Start Date: January 2003

Need for Study: FERC guidelines require the licensee to cooperate with local, State, and federal agencies in the determination of public recreation needs and to cooperate in the preparation of plans to meet those needs, including those for sport fishing and hunting.

Objective: The objective of this study is to identify the effects of fish and wildlife management on providing recreational opportunities within the Project area.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will develop an understanding of management issues and assess existing and future opportunities to enhance wildlife-related recreation. The results of this study will be input to SP-R17, Recreation Needs Analysis and used to develop that portion of a Comprehensive Recreation Plan focusing on the maintenance or enhancement of fish and wildlife-related recreational opportunities.

Abstract: SP-R5 – Assess Recreation Areas Management

Type of Study: ● Desktop Study ○ Field Study

Start Date: January 2003

Need for Study: FERC requires a statement of existing measures to be continued or maintained for the purposes of creating, preserving or enhancing recreational opportunities at the Project. Additionally, FERC guidelines require the licensee to cooperate with local, State, and federal agencies in the determination of public recreation needs and to cooperate in the preparation of plans to meet those needs.

Objective: The objective of this study is to identify the effects of recreation area management on providing recreational opportunities within the Project area.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will assess the current range of recreation area management actions being undertaken, and will identify the responsible agencies, and will evaluate actions and funding necessary to maintain or enhance recreation opportunities associated with Project facilities and waters. The results will include findings and identify recreation area management options to maintain, preserve, or enhance recreational opportunities. The results of this study will be used to develop that portion of a Comprehensive Recreation Plan focusing on the management of recreation facilities.

Abstract: SP-R6 - ADA Accessibility Assessment

Type of Study: ○ Desktop Study ● Field Study

Start Date: September 2002

Need for Study: This study is needed to meet the FERC direction to ensure public access for people with physical disabilities, and to ensure compliance with the Americans with Disabilities Act guidelines for buildings and facilities.

Objective: The main objective of this study is to determine the current accessibility and future accessibility needs for people with disabilities to use project-related recreation facilities and to participate in the Project's primary recreation activities such as boating and camping.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. Internal agency studies by the Department of Water Resources and the Department of Fish and Game will be acquired and reviewed to note past problem areas that can be evaluated for compliance. Field assessments will augment the data review. This study will produce a field study form for assessing recreation facility compliance with ADA and a summary report.

Abstract: SP-R7 - Reservoir Boating Survey

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities, including information on existing recreation uses at project facilities and waters, and boating is a major activity in the area.

Objective: The study objective is to describe existing boating use and water surface management on Lake Oroville and other water bodies that allow boating within the Project area, evaluate adequacy of boating opportunities and determine if water surface management changes are appropriate.

Scope/Methodology/Results: The study area includes the area within the Oroville Facilities FERC boundary and adjacent lands with project nexus. The study consists of six tasks: (1) research local boating issues, (2) assess boating use levels, (3) assess boating infrastructure, (4) assess boaters' perceptions, (5) estimate surface water boating carrying capacity, and (6) prepare a report summary that presents the results of tasks 1 through 5. Results will be used to determine if management changes or facility upgrades are needed to improve boaters' experiences and to identify potential impacts from boating activities to natural and cultural resources on the shoreline.

Abstract: SP-R8 - Carrying Capacity Study

Type of Study: ○ Desktop Study ● Field Study

Start Date: June 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities. This study is needed to meet FERC direction for preparing the portion of a Comprehensive Recreation Plan that considers the recreation carrying capacity of the study area.

Objective: The study objective is to determine a sustainable level of recreational facility development and recreational use that provides high quality opportunities to the Project's primary constituencies, protects the Project's sensitive and natural resources in the area, and is consistent with the planned operation of the Project.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study involves conducting three inter-related tasks: 1) data collection for the four capacity types (ecological, physical/spatial, facility, and social), 2) identification of limiting factor(s), and 3) an assessment of overall capacity of the site, Project-wide, and associated activity levels. The results of this study will include an assessment of capacities of each recreational area and the study area as a whole. For each recreation facility, ecological, physical/spatial, facility, and social capacity will be determined and discussed.

Abstract: SP-R9 - Existing Recreation Use Study

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC regulations require estimates of existing and future recreation use at the Project, in daytime and overnight visitation, as well as a description of the methods used to estimate use.

Objective: The main objective of this study is to estimate existing project-related recreational use (both day use and overnight use).

Scope/Methodology/Results: The study area includes recreation facilities within the Oroville Facilities FERC Project boundary, and adjacent recreation facilities with nexus to the Project. The study will include field monitoring and counting of actual usage of campgrounds and day use sites, including dispersed recreation use areas. The study will include sampling various time periods (seasons, holidays, etc.), estimating the level of participation in various recreational activities and analyzing use distribution. The study results will help ensure that existing use levels are maintained or enhanced. Study findings will provide input to other recreation use studies, and will be used to help develop recommendations for recreation needs to be included in a Comprehensive Recreation Plan.

Abstract: SP-R10 - Recreation Facility and Condition Inventory

Type of Study: ● Desktop Study ● Field Study

Start Date: September 2002

Need for Study: FERC requires a statement of existing measures to be continued or maintained for the purposes of creating, preserving or enhancing recreational opportunities at the Project.

Objective: The study objectives are to inventory existing facilities, determine their condition, and identify maintenance issues.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. The study will provide a detailed inventory and evaluation of recreation facilities, use areas, and conditions for each of the sites in the study area. Results will describe current conditions of facilities and be used to make recommendations for facilities' enhancements. The findings of this study will also provide information needed for other recreation-related studies.

Abstract: SP-R11 - Recreation and Public Use Impact Assessment

Type of Study: ○ Desktop Study ● Field Study

Start Date: April 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities. This study is needed to meet FERC direction for preparing the portion of a Comprehensive Recreation Plan that addresses the effects of recreation and public use on biological and cultural resources in the Project area.

Objective: The study objective is to assess recreation and public use impacts to vegetation, soils, water quality, and cultural resources to study area lands and waters.

Scope/Methodology/Results: The study area includes Lake Oroville, the lands and waters within and adjacent (1/4 mile) to the FERC project boundary, and adjacent land with a clear Project nexus. This study will consist of three tasks: 1) develop site impact assessment forms, 2) conduct fieldwork, site mapping and photography, and 3) prepare a summary report of tasks 1 and 2. The results of this study will focus on ecological and cultural impacts at developed and undeveloped recreation facilities in the study area and will provide a baseline of information for future long-term monitoring of public recreational impacts.

Abstract: SP-R12 - Projected Recreation Use

Type of Study: ● Desktop Study ○ Field Study

Start Date: May 2002

Need for Study: FERC regulations require estimates of existing and future recreation use at the Project, in daytime and overnight visitation, as well as a description of the methods used to estimate use.

Objective: The study objective is to project the amount of recreation use in the study area for various intervals throughout the Project's license term.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. The study will involve quantitative and qualitative assessments using previous attendance or use data and expert informed judgment to project future use. Considerations will include statistical demand forecasting, based on estimated population growth, and an assessment of anticipated impacts from other recreational sites. The study results will be used to help determine when recreation facilities and areas may reach capacity, when social carrying capacity of recreation areas may be exceeded, and when user contact levels and natural resource sustainability may become critical. This will include projections for various development scenarios and implications for other recreational studies being developed.

Abstract: SP-R13 - Recreation Surveys

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of its license application. FERC regulations state that a "well documented user survey is an essential part of a good recreation plan."

Objective: The study objectives are to determine user preferences for facility and area development, perceptions of crowding, levels of satisfaction, reasons for visiting the area, reasons for not visiting the area, and background characteristics.

Scope/Methodology/Results: The study area includes the area within the Oroville Facilities FERC project boundary, and a larger region that will include visitors' area of origin. This study will consist of five tasks: 1) identify primary target groups and topics, 2) review relevant previous questionnaires/coordinate with on-going studies, 3) develop questionnaire strategy and administration, 4) design and administer the questionnaires, 5) analyze survey data, and 6) prepare a summary report. Summary data tables will be developed for each recreation target group. Descriptive statistics such as the proportion of respondents supporting a new management action, and averages will be computed for all questions. Results will be used to develop a Comprehensive Recreation Plan.

Abstract: SP-R14 – Assess Regional Recreation and Barriers to Recreation

Type of Study: ● Desktop Study ○ Field Study

Start Date: July 2002

Need for Study: FERC guidelines require the licensee to cooperate with local, State, and federal agencies in planning for recreational use of public lands administered by those agencies adjacent to the Project area. This requires a regional approach. FERC also requires licensees to develop suitable public recreational facilities with adequate public access. This is best accomplished by evaluating recreation demand in a regional context.

Objective: The objective of this study is to determine barriers to increasing existing and future recreational uses within the Project area, including an evaluation of regional recreational opportunities in northern California.

Scope/Methodology/Results: The study area includes the facilities and lands within the FERC Project boundary, adjacent lands, facilities, and areas with a clear Project nexus, and a larger region that will include potential visitors' area of origin. This study will collect and analyze barrier-related data and regional supply and demand information. Results will provide information on the relative attractiveness of the Project area, compared to other reservoir areas in northern California and identify potential barriers and possible enhancement to increase visitation.

Abstract: SP-R15 - Recreation Suitability Study

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2003

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of its relicensing application. This study will identify whether there are areas potentially suitable for new recreation development that may be used to meet the recreation needs of the visitors to the Project area.

Objective: The study objective is to determine areas suitable for potential new recreation facility development in the Project area consistent with the resource opportunities and constraints of the area.

Scope/Methodology/Results: The study scope focuses on developed and dispersed shoreline recreation opportunities that include Lake Oroville, and the lands and waters within the Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. This study will analyze recreation suitability for potential recreation development and dispersed use that balances recreation needs and visitor experience with resource protection and land use/management needs. Opportunities and constraints will be analyzed and ranked, and a summary report will include mapping and summary text of these findings. Suitability acreage totals will be listed and discussed for each area.

Abstract: SP-R16 – Whitewater and River Boating

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities, including information on existing recreation uses at project facilities and waters, and boating is a major activity in the area.

Objective: The study objective is to describe existing boating use and identify ways to enhance or provide recreational experiences for appropriate river-related activities such as rafting, kayaking, canoeing and boat fishing.

Scope/Methodology/Results: The study area includes three reaches of the Feather River above and below Oroville Reservoir. One reach extends upstream from the upper end of the north branch of the Oroville Reservoir to the Poe Powerplant. The second reach extends from the Oroville Reservoir downstream to the river outlet while the third reach extends from the river outlet downstream to Gridley. Lands and waters within and adjacent to the FERC Project boundary will also be studied. The study will review existing data, perform onsite reconnaissance and controlled flow studies as needed to prepare a river boating opportunity assessment. Results will be used to determine if management changes or facility upgrades are needed to improve boaters' experiences and to identify potential impacts from boating activities to natural and cultural resources on the shoreline.

Abstract: SP-R17 – Recreation Needs Analysis

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: FERC regulations require the licensee to prepare a Comprehensive Recreation Plan as part of their application for relicensing hydroelectric facilities, including information on existing recreation uses at project facilities and waters and future recreation development. As part of this Plan, FERC requires the development of a recreation needs analysis.

Objective: The study objective is to summarize findings derived from all other FERC-related studies to identify recreation needs for existing and potential facilities and areas during the next license period.

Scope/Methodology/Results: The study area includes lands within the FERC Project boundary and adjacent lands within ¼ mile with a clear nexus to the Project. The study will compile and review recreation data and results for other FERC-related recreation studies for the Project area and identify general recreation needs with a focus on Project-related recreation needs. A report will include recommendations regarding needed improvement to meet Project recreation needs during the next license period.

Abstract: SP-R18 - Recreation Activity, Spending, and Associated Economic Impacts

Type of Study: ● Desktop Study ○ Field Study

Start Date: Early 2002

Need for Study: The study is needed to comply with FERC guidelines for socioeconomic assessments. Specifically, FERC guidelines suggest "estimates should be provided for changes in employment and income associated with any anticipated modifications to recreation use in the Project area, such as whitewater rafting, boating, or fishing."

Objective: The objectives of this study are to estimate the effects of spending activity generated by current and projected recreation use, and the operations and management of the Oroville Facilities on local business sales, employment, and personal income. A secondary objective of the study is to gain a better understanding of the relationship between the Oroville Facilities and economic development and growth within the region, particularly focused on the Greater Oroville area.

Scope/Methodology/Results: The study area includes communities in close proximity to Lake Oroville, including Oroville, Paradise, Gridley and Biggs, and the unincorporated (countywide) area of Butte County. The study plan will use as inputs economic and other data from existing sources as well as original interviews and surveys of businesses. Data will be used to describe existing conditions for each jurisdiction. Economic impacts will be predicted using numerous models, and an economic impact spreadsheet and summary report will be created. Results of the study will be used to characterize the economic impacts to the cities of Paradise and Oroville, the unincorporated areas of Gridley and Biggs, and to Butte County of existing and projected recreation use and operations and management of Oroville Facilities.

Abstract: SP-R19 - Fiscal Impacts

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: The study is needed to comply with FERC guidelines for socioeconomic assessments. Specifically, FERC guidelines suggest that a socioeconomic assessment should include a "local government fiscal impact analysis."

Objective: The study objectives are to estimate the effects of economic activity generated by current and projected recreation use and by the operations and maintenance of the Oroville Facilities on sales tax revenues, lodging tax revenues, and other tax revenues of local governments, and on local public service costs related to recreation activity and management at Lake Oroville.

Scope/Methodology/Results: The study area will include communities in close proximity to Lake Oroville, including Oroville, Paradise, Gridley and Biggs, and the unincorporated (countywide) area of Butte County. The study will examine existing fiscal conditions for each jurisdiction, including impact of the Oroville Facilities. Impacts will be projected by analyzing growth-related changes in taxable sales caused by changes in visitor spending levels and local procurement of goods and services and changes in lodging taxes. Expenditure impacts will primarily include costs of law enforcement and fire protection. Data will be gathered from interviews and public sources. A fiscal impact spreadsheet model will be created, based on several commonly used fiscal impact techniques. Results of the study will be used to characterize the fiscal effects on affected fire districts, the cities of Paradise, Gridley, Biggs, and the Greater Oroville Area, and Butte County of existing and projected recreation use and operations of Oroville Facilities.

Abstract: SP-C1 - Cultural Resources Inventory

Type of Study: ○ Desktop Study ● Field Study

Start Date: March 2002

Need for Study: The Federal Power Act of 1920 requires that the FERC consider the effects of their actions on historic-era and archaeological resources.

Objective: The objective of this study is to determine the nature and distribution of cultural resources (including archaeological sites, historic resources, and traditional use areas) that could be directly or indirectly affected by the Oroville Facilities.

Scope/Methodology/Results: The study area is within the Oroville Facilities project boundary and appropriate areas outside this boundary (e.g., low-flow channel, adjacent public lands accessible to recreation visitors, and nearby areas of traditional and sacred values) that could be affected by the project. The study will involve background research, oral interviews, tribal and agency consultation/coordination, field surveys, and data analysis to produce inventories of Archaeological, Historic-era, and Traditional Cultural Properties with ethnographic context and ethnohistoric background information.

Confidential archaeological and historic-era resource information will be made available only to managing and responsible parties (DWR, FERC, SHPO, US Forest Service, BLM, DPR, Native American tribes) and will not be distributed to the public. Summary or non-confidential reports that do not include sensitive cultural resources information will be prepared for broader distribution.

Continued discussions to formalize the APE in coordination with BLM, USFS, the Tribes, and the SHPO in the context of Section 106. Detailed survey strategies, sampling protocols, and agreements with the Tribes that will influence the cultural resources inventory effort will be completed.

Abstract: SP-C2 - Cultural Resources Evaluation

Type of Study: ○ Desktop Study ● Field Study

Start Date: April 2003

Need for Study: The Federal Power Act of 1920 requires that FERC consider the project effects on historic-era and archaeological resources. Following inventory efforts, an evaluation for eligibility criteria of the National And California Registers must be conducted in compliance with Section 106 of the National Historic Preservation Act.

Objective: The objective of this study is to evaluate the cultural resources identified during the cultural resources inventory to determine if they are eligible for inclusion in the National Register of Historic Places or the California Register of Historical Resources.

Scope/Methodology/Results: The scope of the study is within the Oroville Facilities project boundary and appropriate areas outside this boundary (e.g., low-flow channel, adjacent public lands accessible to recreation, visitors, and nearby areas of traditional and sacred values) that could be affected by the project. The evaluation study will be guided by appropriate research designs for various resource types. The evaluation of cultural resources will utilize information gathered from SP-C1 and is expected to include additional background research, oral interviews, tribal and agency consultation/coordination, fieldwork, data analysis, and reporting. Where appropriate, some resource information may be kept confidential and made available only to managing and responsible parties. Results will include a cultural resources evaluation report, addressing archaeological, historic-era, and ethnography/ethnohistory evaluations.

Further details will be developed relative to Study Plans C2, C3 and C4 (e.g., need to create research designs to complete the evaluation) in subsequent years. The inventory results from SP-C1 are needed to detail the evaluation methods; the evaluation results are needed to detail the management issues and interpretive opportunities.

Abstract: SP-C3 - Cultural Resources Management

Type of Study: ○ Desktop Study ● Field Study

Start Date: Fall 2003

Need for Study: The Federal Power Act of 1920 requires that FERC consider project effects on historic-era and archaeological resources. In addition, FERC must comply with Section 106 of the National Historic Preservation Act as well as other federal laws and guidelines regulating cultural resources. A Cultural Resources Management Plan is necessary to manage significant cultural resources for the duration of the anticipated new FERC license.

Objective: The objective of this study is to evaluate the need and methods for cultural resource protection, to determine effects of the existing and future project on these resources, and to develop a Cultural Resources Management Plan.

Scope/Methodology/Results: The scope of the study is within the Oroville Facilities project boundary and appropriate areas outside this boundary (e.g., low-flow channel, adjacent public lands accessible to recreation, visitors, and nearby areas of traditional and sacred values that could be affected by the project. The assessment and Plan will be based on the results of the cultural resources inventory and evaluation (SP-C1 and SP-C2). The Plan will consider the effects on cultural resources from ongoing maintenance and operations activities, including developed and undeveloped recreational activities. Results will be used to develop a Cultural Resource Management Plan covering archaeological resources, historic-era resources, and ethnography and ethnohistory. Confidentiality may be necessary and will be honored with respect to some sensitive resource materials and background information.

Further details will be developed relative to Study Plans C2, C3 and C4 (e.g., need to create research designs to complete the evaluation) in subsequent years. The inventory results from SP-C1 are needed to detail the evaluation methods; the evaluation results are needed to detail the management issues and interpretive opportunities.

Abstract: SP-C4 - Cultural Resources Interpretive Evaluation

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2004

Need for Study: Federal laws and regulations require consideration of project effects on historic, cultural, and archaeological resources (Federal Power Act of 1920, Section 106 of the National Historic Preservation Act, others). State laws and regulations also impose certain requirements relative to cultural resources. Public policies and guidelines further emphasize the value of providing information and displays of the project area's cultural heritage.

Objective: The objective of this study is to evaluate the need and opportunities for making appropriate cultural resources data readily available to public users in and around the Oroville Facilities project. The study will also assess the potential of establishing local facilities to maximize the public benefits of cultural heritage values in the project area.

Scope/Methodology/Results: The scope of the study is within the Oroville Facilities project boundary and appropriate areas outside this boundary that may be more appropriate to conduct interpretive displays. The evaluation of interpretive and educational needs and opportunities will be based on the results of the cultural inventory, evaluation, and management efforts (SP-C1, SP-C2, and SP-C3) and will be coordinated with other work groups. Results of the study will include a report addressing the needs for public interpretation/education and displays, methods for accomplishing these objectives, and potential locations for any display/visitor facilities. The interpretive evaluation will be compiled into a report and will recognize the confidential nature of certain sensitive cultural resource data.

Further details will be developed relative to Study Plans C2, C3 and C4 (e.g., need to create research designs to complete the evaluation) in subsequent years. The inventory results from SP-C1 are needed to detail the evaluation methods; the evaluation results are needed to detail the management issues and interpretive opportunities.

Abstract: SP-E1 - Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Much of the analysis required by FERC in the licensing process involves anticipating and planning for effects of various operating options or scenarios. Computer models are needed to estimate system response to changes to determine potential operational, economic and environmental impacts of proposed changes to the Oroville Facilities or operations.

Objective: The objective of this study is to develop and validate models to simulate the physical attributes of Oroville Facilities operations to support studies involving changes to, or impacts on, flow, water levels, water supply, water temperature and power generation.

Scope/Methodology/Results: The physical scope of the project includes the Feather River basin from the upstream boundary of Lake Oroville to the confluence with the Sacramento River. The methodology will include defining the modeling scheme, anticipating needs based on past FERC licensing procedures, defining individual model development plans for which a need is already defined, and actually producing these models, and developing a broader, comprehensive modeling scheme and standardization of outputs. The result of this study will be a suite of modeling tools available to run simulations and perform the analysis necessary to answer various resource questions associated with the licensing effort.

Abstract: SP-E1.1 - Statewide Operations Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: The relicensing process requires analysis of potential impacts from a wide range of operations alternatives. The model developed as a result of this study will be used to produce simulated operational data from these alternatives for use in the required analysis.

Objective: The objective of this study is to develop appropriate statewide modeling tools and perform the benchmark simulations to determine the "boundary" conditions for localized modeling. The study will also evaluate statewide impacts of modified Oroville operations.

Scope/Methodology/Results: The scope includes the major facilities of the US Bureau of Reclamation's Central Valley Project (CVP) and the DWR State Water Project (SWP). This study will include obtaining the CALSIM II model and the initial 2001 and 2020 benchmark studies from DWR and rerunning the initial benchmark simulations to verify model operations. Depending on the need, revised simulations can then be run. The results of the study plan will be a statewide operations simulation model and 2001 and 2020 benchmark studies for use in the modeling process.

Abstract: SP-E1.2 - Local Operations Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC requires analysis of potential impacts from a wide range of local operations alternatives to optimize power generation. This study will produce a specific tool needed to conduct this analysis.

Objective: The objective of this study is to develop a computer model that will perform benchmark simulations allowing the evaluation of local water and power operations of the Oroville-Thermalito Complex.

Scope/Methodology/Results: The scope of this study includes the Oroville Reservoir, Thermalito Forebay – Afterbay complex and the Feather River low flow channel from the Diversion Dam to just downstream of the Thermalito Afterbay return. The study will evaluate potential models and tools that could be used to develop a local operations model for the Oroville – Thermalito Complex. This study will include reviewing the products required from the model and identifying existing data and modeling tools. The local operations alternatives will then be identified and benchmark simulations will be run. The results of the study plan will be a local operations simulation model and 2001 and 2020 benchmark studies for use in the modeling process.

Abstract: SP-E1.3 - Oroville Reservoir Temperature Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate temperature requirements in the Basin Plan.

Objective: The objective of this study is to develop a temperature model for Oroville Reservoir that can simulate release temperatures under different operational alternatives and benchmark simulations.

Scope/Methodology/Results: The scope of this study includes the Oroville Reservoir, including inflows and releases. The methodology used for this study will include an initial determination of model complexity and capability requirements and a review of existing models that could be used followed by model development, calibration and verification. The necessary data for the modeling runs will be identified and collected and the Oroville Release Temperature simulations for the initial 2001 and 2020 Benchmarks Studies will be performed. The results of this study plan will be a temperature model capable of simulating reservoir temperatures for various operating scenarios. Output will be utilized for impact analysis and/or as input to other modeling efforts.

Abstract: SP-E1.4 - Thermalito Complex Temperature Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate temperature requirements in the Basin Plan.

Objective: The objective of this study is to develop a model to estimate the warming between Oroville Reservoir release temperatures and the Afterbay release temperatures using benchmark simulations.

Scope/Methodology/Results: The scope of this study includes the Diversion Pool downstream of Oroville Dam, the Thermalito Forebay and Thermalito Afterbay. The study will evaluate existing data, followed by model development, calibration and verification. The necessary data for the modeling runs will be identified and collected and the Thermalito Temperature simulations for the initial 2001 and 2020 Benchmarks Studies will be performed. The product of this study will be a temperature model for estimating the warming of water in the Thermalito Forebay/Afterbay Complex.

Abstract: SP-E1.5 - Feather River Temperature Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate requirements in the Basin Plan.

Objective: The objective of this study is to develop a tool that can be used to evaluate the temperature impacts of operational alternatives and benchmark studies in the Lower Feather River through the area of Project influence.

Scope/Methodology/Results: The scope of this study includes the Feather River downstream of the Diversion Dam to its confluence with the Sacramento River. This study will determine the model capability requirements, gather and evaluate existing data needed to calculate temperatures, and investigate/select modeling tool for use. After calibration and verification, benchmark temperature analysis will be performed. The results of this study will include a temperature model that can simulate various operating scenarios in the Lower Feather River and the 2001 and 2002 Benchmark Studies.

Abstract: SP-E1.6 - Feather River Flow-Stage Model Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Understanding flow-stage relationships at various points along the Feather River is necessary for analysis of Project effects on various resources including riparian habitat, aquatic resources, special status species and areas subject to overflow.

Objective: The objective of this study is to develop a flow-stage model of the Feather River for use in defining the flow-stage relationships at various points along the river.

Scope/Methodology/Results: The scope of this study includes the Feather River downstream of the Diversion Dam to its confluence with the Sacramento River. This study will first collect existing flow-stage related data by reviewing maps, existing models or relationships, flood maps, and temperature data sets. If required, a model will be developed to adequately characterize the variable river morphology and bed geometry so that fluctuating flow conditions can be described. The results of this study will report flow-stage relationships along the Feather River and may include a verified model for use in modeling flow-stage relationships.

Abstract: SP-E2 - Perform Modeling Simulations

Type of Study: ● Desktop Study ○ Field Study

Start Date:

Need for Study: FERC requires analysis of hypothetical conditions that cannot be evaluated using existing data. Much of this analysis is based on asking "what if" questions and using computer simulation models to derive the economic, environmental or operational effects and system response.

Objective: The objective of this study is to perform computer simulation studies to evaluate various possible conditions at the Oroville Facilities as requested by other work groups as part of their studies.

Scope/Methodology/Results: The physical scope of the study area will include both Statewide and local operations modeling. The Statewide simulations will focus on the major facilities of the USBR Central Valley Project (CVP) and the DWR State Water Project (SWP). Simulations considering local conditions will include the Feather River Basin, from the upstream boundary of Lake Oroville to the confluence with the Sacramento River. To develop and carry out the simulation modeling, work group representatives will meet with modelers to develop and design the assumptions and parameters of the study. A request for running the study will be submitted to the Plenary Group through the appropriate RAM for approval and coordination. The results of the various simulations will be used to evaluate impacts or to supplement additional modeling or technical analysis.

Abstract: SP-E3 -Evaluate the Potential for Additional Hydropower Generation at Oroville

Type of Study: ● Desktop Study ○ Field Study

Start Date:

Need for Study: Federal Power Act directs FERC to consider whether a project will be operated "in a manner most likely to provide efficient and reliable electric service."

Objective: The objective of this study is to identify and evaluate ways to generate additional hydropower or enhance power generation efficiency at the Oroville Facilities.

Scope/Methodology/Results: The study scope is the Oroville Facilities within the FERC boundary. This study will include an evaluation of economic and engineering constraints such as water supply limitations, projected market conditions, and current technology. Impacts to water supply, environmental and recreation resources and flood protection will also be considered. The study will review existing literature on the Oroville Facilities as well as hydropower studies in-progress and update/refine the data, where useful. New concepts for hydropower generation will also be evaluated. The results of the study will be summarized in a report that will identify options for additional hydro generation at the Oroville Facilities and will include a quantitative and qualitative assessment of the significance and feasibility of each option.

Abstract: SP-E4 - Flood Management Study

Type of Study: ● Desktop Study ○ Field Study

Start Date:

Need for Study: A comprehensive plan for developing the waterway for beneficial public use, including flood control, is required by FERC.

Objective: This objective of this study is to document current flood control requirements, analyze flood management under current operations and identify opportunities for future improvements in flood management.

Scope/Methodology/Results: The physical scope of the study area includes the FERC Project 2100Boundary and the Feather River upstream of the Oroville Dam that forms Oroville River Watershed (Oroville Reservoir Watershed) and downstream to confluence with the Yuba River. The study scope focuses on updating existing studies to reflect current conditions and technology relevant to flood forecasting and control. The methodology followed will be to review the existing literature, update studies and/or conduct new studies where relevant, establish a workable system of water agency coordination, and to develop a report identifying and evaluating flood control alternatives. Results will include flood-mapping, measures for improving flood protection, and evaluation of various impacts of flood protection measures.

Abstract: SP-E6 - Downstream Extent of Reasonable Control of Feather River Temperature by Oroville Thermalito

Type of Study: ● Desktop Study ○ Field Study

Start Date: 2003

Need for Study: During the relicensing process, questions regarding the management of water temperatures in the Feather River downstream of the Oroville-Thermalito Complex have been raised. It is necessary to evaluate how far downstream temperature effects, particularly on fisheries, can be controlled by Project operations.

Objective: The objective of this study is to define the ability of the Oroville-Thermalito Complex to control temperatures in the Feather River downstream of the Project under a variety of operational and climatic conditions.

Scope/Methodology/Results: The study scope is the Feather River downstream from the Oroville-Thermalito Complex to the confluence with the Sacramento River, however the study area may be extended if temperature effects are noted further than expected. The study will use an existing temperature computer model and input varied assumptions as they apply to the Oroville-Thermalito Complex and will include a sensitivity analysis. The results of this study will be included in a report that will document the procedures and results of the evaluation and present findings on using the Oroville Thermalito Complex to control downstream water temperature.

Abstract: SP-E7 - Oroville Reservoir Cold Water Pool Evaluation

Type of Study: ● Desktop Study ○ Field Study

Start Date: 2003

Need for Study: To control temperatures downstream, particularly for fishery requirements, it is necessary to evaluate how much cold water is available in the Oroville Reservoir and to identify management options for the Oroville-Thermalito Complex that will minimize impacts to fisheries and the cold-water pool.

Objective: The objective of this study is to quantify the availability of the cold-water pool in Oroville Reservoir to control downstream water temperatures in the Feather River under a variety of operational and climactic conditions.

Scope/Methodology/Results: The study area is the Oroville Reservoir. The study will use the existing 1-D monthly time step US Bureau of Reclamation Oroville Reservoir temperature model, with any modifications needed, to evaluate the availability of cold water, both seasonally and annually in Oroville Reservoir under varied hydrologic and climatic conditions. The results will be analyzed and a report will be developed documenting the procedures and findings of the evaluation. The report will include statistical, tabular and graphical representation for the available cold-water pool at different times of the year under varied conditions.

Abstract: SP-E8 -Temperature Impacts of Pumpback Operation on Oroville Reservoir Cold Water Pool

Type of Study: ○ Desktop Study ● Field Study

Start Date: 2003

Need for Study: To control temperatures downstream, particularly for fishery requirements, it is necessary to evaluate how much cold water is available in the Oroville Reservoir and to identify management options for the Oroville-Thermalito Complex that will minimize impacts to fisheries and the cold-water pool. This study is needed to understand the role of the pumpback operations in cold water pool availability.

Objective: The objective of this study is to quantify the effects of pumping warm water back into the Oroville Reservoir cold-water pool following power generation. It is intended that information from this study will determine whether the impacts are significant enough to be included into the Oroville temperature model development.

Scope/Methodology/Results: The physical scope of the study area is the Oroville Reservoir and the Thermalito Forebay – Afterbay complex. This study will include a review of existing data and the installation of required temperature and/or reservoir sensors. Pumpback tests will be performed and data will be collected profiling release and pumpback flows and temperatures as well as cold-water pool temperatures. A report will be compiled that will provide information on impacts on the cold-water pool and temperature from Project operations. This information will be used both for Oroville temperature model development and performance of alternative operational simulations.

Abstract: SP-G1 - Effects of Project Operations on Geomorphic Processes Upstream of Oroville Dam

Type of Study: ○ Desktop Study ● Field Study

Start Date: March 2002

Need for Study: Stakeholders have identified altered sediment routing and reservoir drawdown caused by Project operations as potentially affecting resources within the Feather River and tributaries above the lake. Understanding geomorphic processes upstream of Oroville Dam is critical to support evaluations of ongoing Project effects on riparian resources, water quality, fish and wildlife needed for NEPA/CEQA compliance.

Objective: The objective of this study is to determine ongoing project operation effects (primarily seasonal water level changes) on reservoir sedimentation, mass wasting, shoreline erosion, channel geomorphology, and sediment transport in the Feather River in and above Lake Oroville.

Scope/Methodology/Results: The study area includes the reservoir and its tributaries that are influenced by drawdown of the lake. Specific upstream extent of the study area will be based on initial survey results of the reservoir shoreline exposed during low water conditions. This study will involve existing data review, field mapping of channel resources in tributaries, re-surveying reservoir cross-sections to determine sediment storage, and tributary cross-section monitoring to determine changes in river geomorphic, sediment transport and hydraulic parameters that have occurred in the tributaries and lake above Oroville Dam using Fluvial 12 as a modeling tool. The results will be provided to other studies to be used in their evaluations of ongoing Project effects on riparian resources, water quality, fish and wildlife.

Abstract: SP-G2 - Effects of Project Operations on Geomorphic Processes Downstream of Oroville Dam

Type of Study: ○ Desktop Study ● Field Study

Start Date: March 2002

Need for Study: Understanding geomorphic processes downstream of Oroville Dam is critical to support evaluations of ongoing Project effects on riparian resources, water quality, fish and wildlife needed for NEPA/CEQA compliance and compliance with beneficial uses as defined in the Basin Plan.

Objective: The objective of this study is to determine the effects of altered downstream hydrology and sediment retention in Lake Oroville on channel geomorphology and sediment transport below Lake Oroville.

Scope/Methodology/Results: The study area includes the Feather River below Oroville Dam. This study will involve existing data review, field mapping of channel resources in the Feather River, establishment of photo points and cross-sections to monitor sediment transport and erosion, modeling and data analysis to determine changes in river geomorphic, sediment transport and hydraulic parameters that have occurred downstream of Oroville Dam using Fluvial 12 model as a tool. The results will be provided to other studies to be used in their evaluations of ongoing Project effects on riparian resources, water quality, fish and wildlife.

Abstract: SP-W1 – Project Effects on Water Quality Designated Beneficial Uses for Surface Waters

Type of Study: ○ Desktop Study ● Field Study

Start Date: February 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate requirements in the Basin Plan.

Objective: The objective of this study is to evaluate the physical, chemical, and biological integrity of water quality within Project-affected waters for compliance with the Basin Plan.

Scope/Methodology/Results: The study area includes Lake Oroville, its main tributaries, Thermalito Diversion Pool, Forebay and Afterbay, the Oroville Wildlife Area ponds, and the Feather River downstream to the confluence with the Sacramento River for project-related effects. Monitoring stations will collect data on water temperature, dissolved oxygen, conductivity, pH, and turbidity. Water samples will be analyzed for minerals, nutrients, metals, oil, grease, pesticides, and bacteria. Organic constituents sampled from Project-affected waters will be described and the aquatic macroinvertebrate communities will be assessed. Project-affected waters will also be tested for aquatic toxicity to identify parameters that may be adversely affecting aquatic life. Results of the study will be used to determine whether project-affected waters meet the numerical and narrative Basin Plan objectives and are protective of beneficial uses designated in the Basin Plan.

Abstract: SP-W2 - Contaminant Accumulation in Fish, Sediments and the Aquatic Food Chain

Type of Study: ○ Desktop Study ● Field Study

Start Date: Spring 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate requirements in the Basin Plan. Analysis of the presence of mercury and other contaminants is necessary in order to determine this.

Objective: The objectives of this study are to evaluate: (1) levels of metals and organic contaminants in sediments impounded within project waters, (2) potential effects of contaminated sediments on the food web in the project area, and (3) effects of project features, operations, and maintenance on sediment contamination and bioaccumulation in aquatic organisms.

Scope/Methodology/Results: The study area includes the North, Middle, and South forks of the Feather River and the West Branch and the Concow Creek just above their confluences with the reservoir, Lake Oroville, Diversion Pool, Thermalito Forebay and Afterbay, the Feather River from Oroville Dam to downstream of the Afterbay Outlet, and Oroville Wildlife area ponds. This study will involve the analysis of metals and organic contaminants in fish and crayfish in the project area and, if detected at levels greater than the criteria for protection of human health or fish and crayfish predators, the evaluation of metals and organic contaminants in sediments, fish, and crayfish in tributaries to the reservoir. Results from this study will be used to evaluate the effects of the project and project operations in sediments and bioaccumulation of contaminants in fish and crayfish.

Abstract: SP-W3 - Recreational Facilities and Operations Effects on Water Quality

Type of Study: ○ Desktop Study ● Field Study

Start Date: February 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Analysis of the effects of recreational facilities is required by FERC, and is also one of the inputs required to obtain the water quality certification from the State Water Resources Control Board (SWRCB).

Objective: The objective of the study is to evaluate the potential effects from recreational facilities, operations, and activities on the physical, chemical, and biological integrity of Project waters.

Scope/Methodology/Results: The study area is generally within the FERC Project boundary, but also includes adjacent lands and waterways for effects to project waters, and downstream for project effects in the Feather River. Interviews and field surveys will be conducted, recreation facilities will be reviewed, monitored, and evaluated. The study will focus on evaluating the potential for current and potential future recreation facilities, operations, and activities to affect water quality, and monitoring to determine current contamination. Information derived from this study will be compared to water quality goals and criteria for protection of beneficial uses to determine whether recreational facilities, operations, and activities adversely affect the physical, chemical, and biological integrity of Project waters.

Abstract: SP-W5 - Project Effects on Groundwater

Type of Study: ○ Desktop Study ● Field Study

Start Date: February 2002

Need for Study: The study is necessary to obtain the State Water Resources Control Board water quality certification required by FERC. Information required by the SWRCB for certification includes evidence of compliance with appropriate requirements in the Basin Plan.

Objective: The objective of the study is to evaluate the effects of Project features and operations of the Thermalito Forebay and Afterbay and the Feather River in the project area on groundwater quality and levels, and the effects of subsurface movement on the hyporheic zone and its connectivity with ponds in the Oroville Wildlife Area.

Scope/Methodology/Results: The study area is generally down gradient from the Thermalito Forebay and Afterbay, the Feather River and ponds within the Oroville Wildlife Area. Groundwater quality information from the study area will be compared with surface water quality information collected in Study Plan SP-W1 to assess effects from the project. Groundwater levels will be monitored to determine effects from the project to area groundwater levels and pond levels in the Oroville Wildlife Area. Surface water quality and groundwater elevation data obtained in this study will be compared to applicable numerical and narrative water quality objectives and goals. Suitable wells will be identified (or constructed, if necessary) to collect groundwater quality information. The findings will be used to evaluate project effects on beneficial uses for groundwater in the project area as defined in the Basin Plan.

Abstract: SP-W7 - Land and Watershed Management

Type of Study: ○ Desktop Study ● Field Study

Start Date: March 2002

Need for Study: FERC requires a report on land management to determine Project conformance and compatibility with local and regional land uses and plans. In addition, State Water Resources Control Board water quality certification, which is required by FERC as part of the licensing process, must take into account effects from Project-related land use and management.

Objective: The study will evaluate existing and future Project-related land and watershed activities that have the potential to affect water quality.

Scope/Methodology/Results: The study area includes lands within the FERC project boundary and adjacent lands for effects to resources within the project boundary. The study will evaluate both existing and potential future effects to water quality from physical, chemical, and biological land uses and management within and adjacent to the Project boundary. Parameters that may be monitored to determine effects from the various land use and management activities may include turbidity, erosion, nutrients, minerals, metals, pesticides, bacteria, and dissolved oxygen, among others. The first phase of the study will rely on information derived from SP-L1 and SP-L2. The second phase of the study will be undertaken as proposed changes to land use and management activities become formulated. Information derived from this study will be used to evaluate effects to water quality from existing and future land and watershed use and management activities adjacent to and within the Project boundary.

Abstract: SP-W9 - Project Effects on Natural Protective Processes

Type of Study: ○ Desktop Study ● Field Study

Start Date: Early 2002

Need for Study: The U.S. Fish and Wildlife Service and the National Marine Fisheries Service requires information to determine Project effects on the habitat of listed species, including salmon and steelhead for ESA compliance.

Objective: The study objective is to determine the effect of the Project on natural protective processes of those special areas adjacent to, and under the influence of, Project waters that impact water quality. The goal is to eliminate, reduce, or control Project-related effects to maintain and enhance the viability and sustainability of ecosystems along the Feather River.

Scope/Methodology/Results: The study area will include waters and lands within the Project boundary, and along the Feather River within the levee system, if present, or the extent of the riparian/wetland vegetation, whichever is greater, downstream to the Sacramento River. The study will compare historical riparian and wetland maps, including riffle areas, to current maps to assess the amount and type of change that may have occurred to riparian and wetland areas as a result of Project-related activities, and survey and track large woody debris to determine the extent of downstream migration. These data will be analyzed to determine if there is any net loss of functionality with respect to their protective processes in the Project-affected waters of the Feather River system.

Abstract: SP-T1 – Effects of Project Features and Operation on Wildlife and Wildlife Habitat

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: Identification and quantification of project effects on wildlife and wildlife habitat has been raised as an issue by relicensing stakeholders including stakeholders with mandatory conditioning authority and is a FERC requirement. Evaluation of project effects on wildlife is also required for CEQA/NEPA compliance.

Objective: The objective of this study is to identify current and future project effects on wildlife and wildlife habitat, including band-tailed pigeon, black bear, waterfowl, black-tailed deer, special emphasis species, harvest species, and species biodiversity.

Scope/Methodology/Results: The study area is generally within the FERC Project boundary but also includes the Feather River downstream to the confluence with the Sacramento River. This study will utilize information/results from the other wildlife-related studies to analyze effects of project features and operation, recreation facilities and use, and land management activities on wildlife and wildlife habitat. Results will be incorporated into a Wildlife Management Plan for submittal to FERC as part of the license application.

Abstract: SP-T2 – Project Effects on Special Status Species

Type of Study: ○ Desktop Study ● Field Study

Start Date: April 2002

Need for Study: The federal Endangered Species Act (FESA) requires evaluation and consultation to avoid take of listed species or adverse modification of their habitats. The California Endangered Species Act (CESA) also requires assessment of the proposed project's impact on listed species. Both CEQA and NEPA require assessment of a project's impacts on State and Federally listed species and their habitats. In addition, CEQA requires an evaluation of species that have not been listed under the FESA or CESA, but meet the definition of threatened and endangered as listed in the CESA. CEQA requires evaluation of project impacts on State and federal species of concern. This study is needed to provide sufficient information for these consultations and CEQA/NEPA documentation.

Objective: The objective of this study is to provide information on special status species occurrence and distribution within the study area and potential project effects to those species sufficient for use in consultation with State and federal wildlife management agencies

Scope/Methodology/Results: The study area includes the FERC Project boundary and the Feather River downstream to the confluence with the Sacramento River and lands outside the boundary as appropriate. Scopes for surveys focused on protected species will be determined on a species by species basis in consultation with appropriate management agencies. This study includes field inventories and data analyses to determine status of occurrence and project effects on special status animals and plants within the study area. Opportunities for special status species' habitat protection and enhancement will be identified. Results will form the basis for a Biological Assessment and NEPA/CEQA documentation.

Abstract: SP-T3/5 – Riparian Resources, Wetlands, and Associated Floodplains

Type of Study: ○ Desktop Study ● Field Study

Start Date: May 2002

Need for Study: This study will describe existing conditions for wetland and riparian vegetation and project effects as required under both NEPA and CEQA. This information is also required for license review under the Federal Power Act.

Objective: The objectives of this study are to assess the effects of project-water operations on wetland and riparian habitats and to assess the effects of project operations on isolated wetland habitats within the FERC Project boundary.

Scope/Methodology/Results: The study area includes all areas within the FERC Project boundary and downstream Feather River floodplain to the confluence with the Sacramento River. This study includes field inventories, mapping, and data analyses to determine status of occurrence, riparian recruitment, and project effects on wetland and riparian vegetation within the study area. Opportunities for wetland and riparian habitat protection and enhancement will be identified. Results will provide GIS layers for use with other studies and provide information for a Biological Assessment and NEPA/CEQA documentation.

Abstract: SP-T4 – Biodiversity, Vegetation Communities and Wildlife Habitat Mapping

Type of Study: ○ Desktop Study ● Field Study

Start Date: April 2002

Need for Study: This study will provide information to develop a vegetation cover map describing the botanical resources of the Project area to be included in the license application. These vegetation cover and habitat maps will be used with other studies to assess issues of CEQA, NEPA, and FERC regulatory concern including extent and acreages of plant communities and wildlife habitat, including endangered or threatened species habitat and riparian and wetland habitat.

Objective: The objectives of this study are to complete plant community and wildlife habitat mapping for use in evaluating project-related effects on biological resources consistent with the CEQA, NEPA, and FERC regulatory framework.

Scope/Methodology/Results: The study area includes all areas within 0.5 miles of the FERC Project boundary and downstream Feather River floodplain to the confluence with the Sacramento River. This study includes aerial photography review, field inventories, mapping, and data analyses to determine plant communities within the study area and then to convert these vegetation cover maps to wildlife habitat classes. Culturally significant plant communities important to local Native Americans will also be mapped. Results will provide GIS layers for use with other studies and to develop management options, and provide information for NEPA/CEQA documentation.

Abstract: SP-T6 – Interagency Wildlife Management Coordination and Wildlife Management Plan Development

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: Several land management agencies actively manage wildlife resources within the Project boundary. Stakeholders have suggested that opportunities exist to improve interagency coordination, management, and planning related to wildlife resources. This study is important to the development of a Wildlife Management Plan as required by FERC.

Objective: The objectives of this study are to identify opportunities to enhance interagency coordination, management, and planning and develop a coordinated, interagency terrestrial Wildlife Management Plan for the project area.

Scope/Methodology/Results: The study area includes all lands within the FERC Project boundary. This study will collect and analyze current land management mandates and practices to develop an interagency Wildlife Management Plan, identifying how interagency coordination will occur in the future and guidelines for wildlife management, plus an evaluation of current wildlife management and opportunities for interagency habitat improvements.

Abstract: SP-T7 – Project Effects on Noxious Terrestrial and Aquatic Plant Species

Type of Study: ○ Desktop Study ● Field Study

Start Date: April 2002

Need for Study: Noxious terrestrial and aquatic plant species can adversely impact native species, including State and federal special status species. State and federal agencies must comply with applicable State and federal noxious weed legislation.

Objective: The objectives of this study are to provide sufficient information for State and federal noxious weed legislation compliance; to allow for habitat analysis consistent with ESA and to address concerns of stakeholders related to infestation and spread of noxious terrestrial and aquatic plant species as a result of project operations and maintenance activities.

Scope/Methodology/Results: The study area includes all areas within 0.5 miles the FERC Project boundary, downstream irrigation canals, and downstream Feather River levees to the confluence with the Yuba River. This study will include literature surveys, field species surveys, and data collection relative to dispersal mechanisms to assess effects of project-related-land use practices and project operations on noxious terrestrial and aquatic plant species occurrence and spread.

Abstract: SP-T8 – Project Effects on Non-Native Wildlife

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: Non-native wildlife species can adversely impact native wildlife, including State and federal special status species. Further, NEPA requires an assessment of public health impacts and several of the undesirable non-native species that may carry or transmit disease to humans may be attracted to currently developed Project recreation facilities.

Objective: The objective of this study is to identify potential changes in project operations, land use, features and management practices that could serve to reduce the potential impact of seven identified undesirable non-native wildlife species.

Scope/Methodology/Results: The study area includes all areas within the FERC Project boundary, and downstream within the Feather River floodplain to the confluence with the Yuba River as well as areas outside the Project boundary as appropriate. This study will include a literature review and desktop evaluation to identify general management guidelines within the study area that serve to limit the occurrence of the seven identified undesirable non-native wildlife species: house sparrow, rock dove, European starling, black rat, Norway rat, house mouse, and red fox.

Abstract: SP-T9 – Recreation and Wildlife

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: Both direct and indirect impacts to wildlife and the plant communities that support them may occur as a result of the high level of recreational use in the Project area. The results of this study are required for both CEQA and NEPA compliance.

Objective: The objectives of this study are to identify current and future recreation-related direct and indirect impacts to wildlife and plant communities and identify opportunities to reduce or eliminate those impacts.

Scope/Methodology/Results: The study area includes all areas within the FERC Project boundary and other areas potentially affected by Project recreation facilities and use. This study will utilize information from other studies, including wildlife habitat/plant community map, ESA surveys, recreational development and use surveys to map existing and potential areas of opportunities and areas of constraints associated with recreational use and wildlife conflicts. Results will identify recreation/wildlife conflicts with recommendations for area-wide and site-specific avoidance or remediation actions.

Abstract: SP-T10 – Effects of Project Features, Operation and Maintenance on Upland Plant Communities

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: Stakeholders have identified project-related facilities, operations, maintenance, and recreation facilities and associated activities as having potential effect on upland plant communities. An evaluation of project effects on botanical resources is required for both CEQA and NEPA compliance.

Objective: The objectives of this study are to identify direct and indirect impacts of project features on upland vegetation communities including rare or unique plant communities.

Scope/Methodology/Results: The study area includes all areas within the FERC Project boundary and other areas potentially affected by Project recreation facilities and use. This study will utilize existing literature and information from other studies, including vegetation community mapping, ESA surveys, noxious weed surveys, and Project-related facilities operation and maintenance data to evaluate the status of upland plant communities in the study area and map project-related effects. This qualitative assessment will include current vegetation patterns, project-related effects, enhancement opportunities and proposed guidelines for future development of facilities or land use that will minimize impacts to local native upland plant communities.

Abstract: SP-T11 – Effects of Fuel Load Management and Fire Prevention on Wildlife and Plant Communities

Type of Study: ● Desktop Study ○ Field Study

Start Date: April 2002

Need for Study: CEQA requires evaluation of potential project impacts related to safety including increased risk of wildfire. Stakeholders have expressed concern that historic land management and fire prevention activities within the FERC Project boundary have resulted in increased fuel loading which has led to an increased risk of destructive wildfire.

Objective: The objective of this study is to provide information to the Land Use, Land Management and Aesthetics Work Group that will allow assessment of the effects of historic and potential future fuels management activities on biological resources within the Project boundary.

Scope/Methodology/Results: The study scope includes all terrestrial plant communities and wildlife habitats present within the FERC Project boundary. This study will involve a literature review and evaluation of habitat mapping information from SP-T4 to develop predictions of ecological effects of historic and current fire prevention practices on major plant communities and wildlife habitat within the study area. The study will also evaluate effects of fuels management options on those plant communities and wildlife habitats. This study will provide information to the Land Use, Land Management and Aesthetics Work Group.

Abstract: SP-F1 – Evaluation of Project Effects on Non-Fish Aquatic Resources

Type of Study: ○ Desktop Study ● Field Study

Start Date: Spring 2002

Need for Study: Relicensing of the Oroville Facilities by the FERC requires certification from the State Water Resources Control Board (SWRCB) that the Project complies with Section 401 of the Federal Clean Water Act. Information required by the SWRCB for certification includes evidence of compliance with appropriate requirements in the Basin Plan. Additionally, this study is needed to provide sufficient information for CEQA/NEPA documentation.

Objective: The objectives of this study are to identify the macroinvertebrates and their available habitat present within the Project waters and to evaluate the effects of project features, operations, and maintenance on these resources, using macroinvertebrate and plankton assemblages as indicators.

Scope/Methodology/Results: The study area includes waters within the FERC Project boundary. This study will involve a literature review and, using aerial photos, mapping data and field verification, develop and base maps depicting areas of potential habitat within the Project area. Representative habitat locations will be identified and specific sampling protocol developed. Samples will be analyzed and findings presented. The results will define the existing condition of aquatic macroinvertebrate and plankton resources and assess the potential of operational changes to impact these resources within the project waters.

Abstract: SP-F2 – Evaluation of Project Effects on Fish Diseases

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the effects of ongoing and future Project operations (pump-back operations, hatchery production, water temperature, etc.) on the establishment, transmission, extent and control of IHN, BKD, and other significant fish diseases within the Project-affected waters.

Scope/Methodology/Results: The study area encompasses waters within the Feather River basin, including waters within the FERC Project boundary, tributaries upstream to the current upper migratory limit and the Feather River downstream to the Sacramento Delta and San Francisco Bay. This study will involve a literature review and evaluation of Project and hatchery operations to analyze how these operations, including hatchery release practices, might affect the establishment, extent and control of diseases. If necessary, the study will be augmented with field investigations. Results will be presented in a report and will include recommendations for minimizing potential Project impacts on the establishment and transmission of fish diseases in the Feather River basin.

The study plan will be coordinated with SP-4, Evaluation of Project Effects on Fish Passage Upstream of Lake Oroville and SP-15, Evaluation of the Feasibility to Provide Passage for Anadromous Salmonids Past Oroville Facility Dams.

Abstract: SP-F3.1 – Evaluation of Project Effects on Fish and Their Habitat Within Lake Oroville, its Upstream Tributaries, the Thermalito Complex and the Oroville Wildlife Area

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultation and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the ongoing and potential future Project effects on resident coldwater and warm water fish and their habitat within Project waters. This study does not evaluate Project effects on anadromous salmonids.

Scope/Methodology/Results: The study area includes Lake Oroville, its upstream tributaries, and the Thermalito Complex. This study will involve a literature and data review and evaluation of Project operations to analyze how these operations affect resident fish species and their habitat requirements. Distribution of resident fish species within the study area, species' life history, habitat requirements and habitat conditions within the study area will be determined. Findings will be presented in a report with accompanying tabular information and GIS-based map products.

Abstract: SP-F3.2 – Evaluation of Project Effects on Non-Salmonid Fish in the Feather River Downstream of the Thermalito Diversion Dam

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultation and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the ongoing and potential future Project effects on resident coldwater and warm water fish and their habitat within Project-affected waters downstream of the Project facilities. This study does not evaluate Project effects on anadromous salmonids.

Scope/Methodology/Results: The study area includes the Feather River low flow channel downstream of the Fish Barrier Dam to the Thermalito Afterbay river outlet, the Feather River downstream to its confluence with the Yuba River and tributary waters within the FERC boundary. This study will involve a literature and data review and evaluation of Project operations to analyze how these operations affect resident fish species and their habitat requirements. Distribution of resident fish species within the study area, species' life history, habitat requirements and habitat conditions within the study area will be determined. Findings will be presented in a report with accompanying tabular information and GIS-based map products.

Abstract: SP-F4 – Evaluation of Project Effects on Fish Passage Upstream of Lake Oroville

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultations and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the ongoing and potential future Project effects (e.g. inundation, water level fluctuations) on the ability of Lake Oroville resident salmonids to migrate into upper Feather River tributaries.

Scope/Methodology/Results: The study area includes waters within the FERC Project boundary whose surface water elevation may be affected by Oroville Facilities operations and where surface water elevation fluctuation could potentially impact resident salmonid passage to upper Feather River tributaries. This study will involve a literature and data review and evaluation of Project operations to analyze how these operations affect the passage of resident salmonids to and from available fish habitat upstream of Lake Oroville. Availability and use of resident salmonid habitat, habitat requirements and habitat conditions, including barriers, relevant to passage within the study area will be determined. Findings will be presented in a report with accompanying tabular information and GIS-based map products.

This study plan and SP-15, Evaluation of the Feasibility to Provide Passage for Anadromous Salmonids Past Oroville Facility Dams, may be combined into one study plan to deal comprehensively with passage issues. Specific areas that will be expanded include additional detail on how results will be used in the relicensing process as tools to evaluate future potential operational scenarios.

Abstract: SP-F5/7 –Evaluation of Fisheries Management on Project Fisheries

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Warm and coldwater fisheries are important facets of recreation at Oroville Project facilities. Under the existing FERC license, the licensee has been required to implement fish management projects that benefit both fisheries at the Oroville Project facilities. It is anticipated that as part of relicensing, FERC will require a Fisheries Management Plan that benefits recreational fishing while balancing warm and coldwater fisheries in Lake Oroville and Project-affected waters.

Objective: The objective of this study is to evaluate the effect of ongoing and proposed fishery management activities and plans on the goal of a balanced warm and coldwater fishery at the Project facilities and within Project-affected waters and to evaluate the effect of the Oroville Project fisheries on upstream tributary fish.

Scope/Methodology/Results: The study area includes Project-affected waters within the FERC boundary, tributaries upstream to the current migratory limit, and the Feather River downstream to the confluence with the Sacramento River. This study will involve a literature and data review and evaluation of existing and proposed fish management plans and activities to analyze effects on fisheries within the study area. This information will be used to evaluate effects of Project fisheries on the tributary fisheries. Relationship of management activities on balanced fishery goal, including constraints or inconsistencies with FERC-related and other management plans, will be described. Findings will be presented in a report that evaluates the effects of fisheries management plans and activities on fisheries within Project-affected waters. Results will be presented in a summary report.

Abstract: SP-F8 –Transfer of Energy and Nutrients by Anadromous Fish Migrations

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on endangered species and their habitat are also needed for ESA consultations and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the effect of ongoing and proposed Project operations on energy/nutrient conditions upstream of Project facilities.

Scope/Methodology/Results: The study area includes the FERC project waters and tributaries upstream to the pre-project upper migratory limits for fall-run and spring-run chinook salmon and steelhead. This study will estimate fish biomass using literature and data review to estimate currently available spawning habitat in the accessible stream reaches upstream of the reservoir. Habitat mapping will be obtained from results of SP-F15, Evaluation of the Feasibility to Provide Passage for Anadromous Salmonids Past Oroville Facility Dams. If nutrient losses are potentially significant to the nutrient and energy conditions of the upper basin, quantitative modeling and field sampling will be used to quantify the net changes of energy and nutrients to the streams and describe the ecological significance of that change. Results will be presented in a summary report.

Abstract: SP-F9 –Evaluation of the Feather River Hatchery Effects on Naturally Spawning Salmonids

Type of Study: ○ Desktop Study ● Field Study

Start Date: Fall 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultation and NEPA/CEQA compliance.

Objective: Using a combination of literature review, analysis of studies conducted previously, and new field and laboratory studies, analyze the effects of the Feather River Hatchery on naturally spawning salmonids in the Feather River specifically and in general for Central Valley steams.

Scope/Methodology/Results: The study area includes the hatchery, waters of the Project, and the Feather River to the confluence with the Sacramento through to the Delta and San Francisco Bay. It also includes significant tributaries and Central Valley rivers and streams. The study will include a combination of literature review, analysis of studies conducted previously, and new field and laboratory studies as appropriate. Report will be completed by June 30, 2004. Some tasks may continue through the license application deadline and provide supplemental information post application.

This study plan is the subject of on-going discussions with National Marine Fisheries Service.

Abstract: SP-F10 – Evaluation of Project Effects on Salmonids and Their Habitat in the Feather River Below the Fish Barrier Dam

Type of Study: ○ Desktop Study ● Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultations and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the ongoing and potential future Project effects on fall-run chinook salmon, spring-run chinook salmon and steelhead and their habitat in the Feather River below the Fish Barrier Dam.

Scope/Methodology/Results: The study area includes the Feather River from the Fish Barrier Dam to the confluence with the Sacramento River. Since the study plan addresses different salmonid life stages, the study area boundaries vary among specific tasks. This study will utilize literature review and field investigations to evaluate Project effects on: 1) the upstream migration of adult anadromous salmonids in the study area, 2) spawning, incubation, initial and juvenile rearing period of anadromous salmonids in the Feather River, and 3) emigration of juvenile anadromous salmonids in the Feather River. Results will be used to develop protection, mitigation, and enhancement (PM&E) measures for anadromous salmonid populations in the study area. Findings will be presented in a report with accompanying tabular information, graphical representations and GIS-based map products.

Abstract: SP-F15 – Evaluation of the Feasibility to Provide Passage For Targeted Species of Migratory and Anadromous Fish Past Oroville Facility Dams

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultations and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the feasibility of restoring passage for anadromous salmonids to areas upstream of the Fish Barrier Dam, including the area between the Fish Barrier Dam and Thermalito Diversion Dam and upstream of Oroville Dam to the next salmonid migration barrier.

Scope/Methodology/Results: The study area includes the FERC Project waters upstream of the Fish Barrier Dam, including Lake Oroville and its upstream tributaries. This includes areas of the upper Feather River watershed within the fluctuation zone of Lake Oroville. This study will review and assess available information, including information from SP-F10 and SP-F3, regarding life history and habitat requirements of Feather River anadromous salmonids and potential habitat availability upstream of the Fish Barrier Dam and Lake Oroville. The study will also evaluate alternative fish passage facilities, methods for passage and the overall feasibility for successful fish passage at the Oroville Facilities. If feasible, more detailed hydrologic, hydraulic and design considerations will be developed. Results will be presented in a report with accompanying tabular information, graphical representations and GIS-based map products.

Abstract: SP-F16 – Evaluation of Project Effects on Instream Flows and Fish Habitat (PHABSIM)

Type of Study: ● Desktop Study ○ Field Study

Start Date: Spring 2002

Need for Study: Resource agencies participating in FERC relicensing processes commonly rely on information generated from PHABSIM instream flow studies to develop recommended instream flow regimes. FERC also uses these results during their resource balancing deliberations.

Objective: The objective of this study is to analyze flow-habitat relationships to evaluate potential Project effects on anadromous salmonid spawning and rearing habitat within the study area.

Scope/Methodology/Results: The study area includes the Feather River from the Fish Barrier Dam to the confluence with Honcut Creek, near Live Oak. This study will review and evaluate existing information, including hydraulic and habitat suitability data, and perform habitat simulations to determine relationships between stream flow and habitat suitability. Results will be presented in a report describing output from habitat/flow relationship simulations, methodology used, and interpretation of results. A second phase of this study would lead to the Instream Flow Incremental Methodology (IFIM) process.

Abstract: SP-F21 –Project Effects on Predation of Feather River Juvenile Anadromous Salmonids

Type of Study: ○ Desktop Study ● Field Study

Start Date: Spring 2002

Need for Study: FERC regulations require an application for relicensing to include a discussion of the fish, wildlife and botanical resources in the vicinity of the Project and the ongoing and potential future Project-related impacts to those resources. Evaluations of ongoing Project effects on fish populations, endangered species and their habitat are also needed for ESA consultations and NEPA/CEQA compliance.

Objective: The objective of this study is to evaluate the ongoing and potential future Project effects on predation of Feather River juvenile anadromous salmonids.

Scope/Methodology/Results: The study area includes those waters within the Oroville Facilities FERC Project boundary that contain anadromous salmonids and the section of the lower Feather River potentially affected by Project operations. This study will include a literature review to gather information on potential predators, life histories, distribution and predator-habit characteristics. It will also characterize the study area's environmental components, estimate juvenile salmonid losses to predation since Project construction, and review alternative for predator control and management. Results will be used to develop protection, mitigation, and enhancement (PM&E) measures for anadromous salmonid populations in the study area. Findings will be presented in a report with accompanying tabular information, graphical representations and GIS-based map products.