

4.11 Reservoir Fish Habitat

This study is designed to assess the effects of reservoir water level fluctuations at the Sacramento Municipal Utility District’s Upper American River Project (UARP) and Pacific Gas and Electric Company’s Chili Bar Project on fishes. The overall approach is divided into four phases. The first phase includes identifying for each reservoir the normal season, weekly and daily water level fluctuations and the extent of the susceptibility of the fishes that occur in that reservoir to those fluctuations. The second and third phases include, for those fishes that are susceptible, characterizing and quantifying the amount of habitat affected by water level fluctuations. The last phase is an assessment of how the water level fluctuations affect each fish species. The work will occur in 2002, and information from the UARP Relicensing Fish Survey Study and Water Temperature Study as well as UARP’s recent bathymetry study will be needed for the UARP reservoirs.

4.11.1 Pertinent Issue Questions

This Reservoir Fish Habitat Study Plan addresses the following Aquatic/Water Issue Questions:

- 18. Do annual/seasonal/daily water level fluctuations in reservoirs affect aquatic species? Which ones are affected? How are they affected? When are they affected?
- 30. What are the effects of the Project to warm water fisheries in the project reservoirs?
- 35. How are project releases into Chili Bar affecting aquatic resources?

Note that this study plan only addresses fish: amphibians and aquatic reptiles are addressed in the Amphibians and Aquatic Reptiles Study Plan. The fish species that occur in the Project reservoirs will be confirmed based on the Fish Surveys Study. For the purposes of this study plan’s execution, it is understood that SMUD will address the UARP reservoirs and SMUD and PG&E will jointly address Chili Bar Reservoir.

4.11.2 Background

This study focuses on the potential effects of reservoir water level fluctuations on fishes. While studies have not yet been completed, SMUD’s Initial Information Package (SMUD 2001) provides some insight into the fish species composition in the UARP reservoirs and normal UARP Project reservoir water level fluctuations. This information is summarized in Table 1 below.

TABLE 1. Fishes reported to occur in Sacramento Municipal Utility District’s Upper American River Project reservoirs and normal water level fluctuations in those reservoirs.

<i>Reservoir</i>	<i>Fishes Reported to Occur¹</i>	<i>Normal Water Level Fluctuations (feet)</i>
Rubicon	Rainbow Trout, Brown Trout, Brook Trout & Golden Trout	12
Rockbound	Rainbow Trout, Brown Trout & Brook Trout	---
Buck Island	Rainbow Trout, Brown Trout & Brook Trout	11
Loon Lake	Rainbow Trout, Brown Trout, Brook Trout, California Roach, Chubs, Sacramento Sucker & Green Sunfish	36
Gerle Creek	Rainbow Trout, Brown Trout & Brook Trout	5
Robbs Peak	Rainbow Trout & Brown Trout	6
Ice House	Rainbow Trout, Brown Trout, Brook Trout, Kokanee Salmon, & Golden Shiner	42
Union Valley	Rainbow Trout, Lake Trout, Cutthroat Trout, Kokanee Salmon, Sacramento Sucker, Smallmouth Bass, Golden Shiner, Green Sunfish & Mosquitofish	53
Junction	Rainbow Trout, Lake Trout, Stocked Cutthroat Trout, Kokanee Salmon, Sacramento Sucker, Smallmouth Bass, Golden Shiner, Green Sunfish & Mosquitofish	15
Camino	Rainbow Trout, Brown Trout, Brook Trout, Sacramento Sucker, Minnows, California Roach & Riffle Sculpin	20
Brush	Rainbow Trout	20
Slab Creek	Rainbow Trout, Brown Trout, Brook Trout, Kokanee Salmon, Sacramento Sucker, Minnows, California Roach, Hardhead, Speckled dace, Smallmouth Bass & Sculpin	30

¹ From Page E3-14 through 30 of SMUD’s IIP.

² From Pages B21 through 42 of SMUD’s IIP

4.11.3 Study Objectives

The objective of this study is to assess how reservoir water level fluctuations effect fish.

4.11.4 Study Area

The study area will include all UARP reservoirs with the exception of Robbs Peak reservoir since it fluctuates only 5 to 6 feet annually. Also, Rockbound Lake is not included in the study area since the Licensee does not control water level fluctuations in this lake. PG&E's Chili Bar Reservoir is included in the study area.

4.11.5 Information Needed From Other Studies

Information needed from other studies includes: 1) the fish species that occur in each reservoir from the Fish Surveys Study; 2) channel geomorphology data from the Channel Morphology Study Plan; 3) water quality data from the Water Quality Study Plan; and 4) water temperature conditions in the reservoirs from the Water Temperature Study. Additionally, SMUD and PG&E will need to characterize seasonal, weekly and daily water level fluctuations in each reservoir. Lastly, information from SMUD's recent reservoir bathymetry study will be valuable in the initial identification of potential habitat in UARP reservoirs

4.11.6 Study Methods And Schedule

The study assessing coldwater and warmwater fish habitat will be conducted in four phases, each of which is described below.

Phase 1 – Identify Fish Species in Each Reservoir and Their Likely Sensitivity to Water Level Fluctuation

- As a first step, SMUD and PG&E will confirm which fishes (and life stages) occur in each Project reservoir in the study area (from the Fish Survey Study) and, by reviewing existing scientific literature, determine the susceptibility of each of these fishes and their life stages to water level fluctuation. This could include dewatering of nests for fish that nest in shallow water, loss of cover for species that use shallow vegetated areas for cover, loss of spawning opportunities for species such as trout that may migrate from the reservoir into streams for spawning if channels in the reservoirs have impassable sections, and water temperature impacts if reservoir pools are drawn down to very low levels.

Phase 2 – Characterize Habitat

- For those fishes that could be affected by water level fluctuations, SMUD and PG&E will identify the variety of habitats in the reservoir areas that are normally subject to fluctuation. This will be done first using existing reservoir bathymetry maps, and then confirmed in the field when the reservoir is drawn down. For instance, bathymetry maps may allow the Licensee to categorically exclude portions of the reservoirs (such as steep walled granite areas, areas near the dam, etc.) while other areas (shallow flat areas) may suggest potential habitat. The steep walled areas will not be visited in the field. The shallow areas will be visited to describe the quality of the habitat (substrate, bank stability, vegetation, etc.). The habitat types will be grouped and displayed on a map of the reservoir. Also, any barriers in channels that might provide access to fish migrating from the reservoir to streams will be identified and shown on the map. During this phase, any areas that show obvious erosion will be documented.

Phase 3 – Quantify Habitat and Minimum Pool

- Using the maps developed in Phase 2, the SMUD and PG&E will quantify the amount of habitat affected for each reservoir and species as that reservoir undergoes normal water level fluctuations. This will include an estimate of minimum pool.

Phase 4 – Assess Impacts to Fishes

- Based on the amount and quality of habitat in the reservoir water level fluctuation zone and the timing of when that habitat is effected, the SMUD and PG&E will assess the potential effects of water level fluctuations on

fishes. This assessment will include an evaluation of how water level fluctuations might affect warm water fish species in the reservoir, and the quality of the current fishery if known.

It is anticipated that Phase 1 will occur in mid to late summer 2002 after the Fish Surveys Study is complete. Phase 2 (evaluating habitat) will occur in late summer and early fall 2002 when the reservoirs are normally at their lowest level, and will likely be combined with other fieldwork in the Project reservoirs. Phase 3 and 4 will occur in fall and early winter 2002. It is anticipated that a presentation will be made to the Aquatics TWG and Plenary Group in late winter 2002/2003, and will include recommendations for gathering any additional information, if needed. If additional field studies are needed, they will occur in 2003.

4.11.7 Analysis

As described above, data analysis will include identifying and mapping potential fish habitat in the normal water level fluctuation zone for each reservoir, and quantifying the amount of habitat affected during normal Project operations. Barriers to fish movement into streams will be identified. An assessment of potential affects will be made.

4.11.8 Study Output

A presentation of study progress will be made to the Aquatics TWG and the Plenary Group in late winter 2002/2003. A written report including the issues addressed, objectives, description of study area and sampling locations, methods, results, discussion and conclusions will be prepared after field visits and analyses are complete. The report will be prepared in a format that can easily be incorporated into SMUD's draft environmental assessment that will be submitted to FERC with SMUD's Licensee's application for a new license.

4.11.9 Preliminary Estimated Study Cost

A preliminary cost estimate for this study will be developed after approval by the Plenary Group.

4.11.10 Plenary Group Endorsement

The Aquatics TWG approved this plan on April 25, 2002. The participants at the meeting who said they could "live with" this study plan were PCWA, El Dorado County, BLM, CDFG, USFS, USFWS, SMUD, SWRCB and PG&E. None of the participants at the meeting said they could not "live with" this study plan. The Plenary Group approved the plan on June 5, 2002. The participants at the meeting who said they could "live with" this study plan were PCWA, El Dorado County, BLM, BOR, USFS, CSPA, SMUD, FOR, PG&E. None of the participants at the meeting said they could not "live with" this study plan.

4.11.11 Literature Cited

SMUD (Sacramento Municipal Utility District). 2001. Initial Information Package for Relicensing of the Upper American River Project (FERC Project No. 2101). Sacramento, CA.