Trout Monitoring Plan

Sacramento Municipal Utility District

Hydro License Implementation • July 2016

Upper American River Project

FERC Project No. 2101

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Acronyms and Abbreviations

Acronym	Definition
BLM	U.S. Bureau of Land Management
CDFW	California Department of Fish and Wildlife
FERC	Federal Energy Regulatory Commission
FL	Fork Length
ft	feet
g	Grams
GPS	Global Positioning System
mm	millimeters
PG&E	Pacific Gas and Electric Company
RWQCB	Regional Water Quality Control Board
SFAR	South Fork American River
SMUD	Sacramento Municipal Utility District
SWRCB	State Water Resources Control Board
TL	Total Length
UARP	Upper American River Project
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION AND BACKGROUND

This Trout Monitoring Plan (Plan) addresses monitoring set forth in the State Water Resources Control Board (SWRCB) section 401 Water Quality Certification, Condition 8.A of Appendix A of the new license order (FERC 2014), the U.S. Department of Agriculture, Forest Service (USFS) section 4(e) Condition No. 31 of Appendix B of the new license order (FERC 2014) for the Upper American River Project (UARP; FERC Project 2101), and the USFS section 4(e) Condition No. 14 for the Slab Creek Flow Facility Project License Amendment (USFS 2015). Attachments 1, 2, and 3 contain the language from these documents as applicable to this Plan.

The UARP is owned and operated by the Sacramento Municipal Utility District (SMUD) and is located within El Dorado and Sacramento counties, primarily within lands of the Eldorado National Forest. The UARP consists of three major storage reservoirs (Loon Lake, Union Valley Reservoir, and Ice House Reservoir), eight smaller regulating or diversion reservoirs, and eight powerhouses. The UARP has an authorized installed capacity of 637.3 megawatts. The UARP also includes recreation facilities containing over 700 campsites, five boat ramps, hiking paths, and bicycle trails at the reservoirs.

2.0 MONITORING PLAN OBJECTIVES

The primary objective of this Plan is to evaluate changes in trout populations throughout the UARP area stemming from SMUD's implementation of the new reservoir release requirements of the new 2014 FERC license. Specifically, this Plan will provide the following information on trout populations in Project-affected stream reaches: (1) trout species abundance, (2) size and age class distribution of trout species, and (3) condition of trout species. Results of the Plan will be compared to trout population data collected during previously conducted studies. Additionally, trout biomass will be computed for each electrofished site and compared to ecological resource biomass objectives derived from Gerstung (1973) and specified in the Rationale Report for the Settlement Agreement (SMUD 2007).

3.0 MONITORING SITES AND FREQUENCY

3.1 MONITORING SITES

Under this Plan, monitoring will occur at locations previously surveyed during relicensing (DTA & Stillwater Sciences 2005) because these sites facilitate comparisons to conditions present prior to implementation of the new release requirements. A total of 22 study sites in 12 stream reaches were sampled during UARP relicensing studies in 2002 and 2003. These sites were identified by relicensing participants to be representative of Project-affected stream reaches based on information from aerial photographs, satellite imagery, area reconnaissance, and historical information (DTA and Stillwater Sciences 2005). License Conditions (Attachments 1 and 2) identify a subset of the relicensing study stream reaches and sites for trout and hardhead monitoring (hardhead monitoring

specifications of the License Conditions are addressed in a separate Hardhead Monitoring Plan). However, minor modifications to the trout monitoring sites are required due to current private land access constraints.

SMUD is proposing three modifications to sampling locations described in Condition 8.A of the SWRCB 401 Water Quality Certification and USFS section 4(e) Condition No. 31, and one additional sampling location associated with USFS section 4(e) Condition No. 14 for the Slab Creek Flow Facility Project License Amendment as follows:

1. The License Conditions specify that sampling occur in the upper segment of site BID-F1, located on the Little Rubicon River below Buck Island Reservoir Dam. However, relicensing surveys sampled both upper and lower segments of the site. To ensure comparability among years both the upper and lower segments are proposed for sampling in this Plan.

2. The License Conditions specify that sampling occur at sites LLD-F1 and LLD-F2 in Gerle Creek below Loon Lake Dam. Site LLD-F1 is located on private land where access is restricted. A new site LLD-F3 is a reasonable substitute because it is in close proximity to site LLD-F1, multiple habitat types (run, pool, etc.) occur in this area, the stream appears to be of similar size, gradient, etc. to the area around LLD-F1, and it is on public land where access is expected to be available for the duration of the monitoring.

3. The License Conditions specify that sampling occur at site JD-F1, located in Silver Creek below Junction Reservoir Dam. However, site JD-F1 is located on private land where access is restricted. A new site JD-F3 is a reasonable substitute because this site exhibits characteristics of other transitional sections in the reach (which may be sampled by electrofishing if it can be performed safely and effectively), where short stretches of flatter gradient with cobble and small boulder substrates, and some sparse streamside vegetation, connect deep bedrock-lined pools or steep cascading sections. Although the split channel characteristic of the site is somewhat uncommon, the wetted stream width of approximately 40 feet is comparable to other such habitats in the reach. The site is on public land and access is expected to be available for the duration of the monitoring.

4. The USFS 4(e) Condition No. 14 for the Slab Creek Flow Facility Project License Amendment (USFS 2015) specifies that a new sampling site be established on the South Fork American River (SFAR) in the 0.25-mile reach between Slab Creek Reservoir Dam and the proposed Slab Creek Flow Facility. This new site is designated SCD-F3.

The following 10 stream reaches with 14 monitoring sites are proposed for sampling:

1. Rubicon River below Rubicon Reservoir Dam (sites RRD-F1 and RRD-F2).
2. Little Rubicon River below Buck Island Reservoir Dam (site BID-F1).
3. Gerle Creek below Loon Lake Reservoir Dam (sites LLD-F3 and LLD-F2).
4. Gerle Creek below Gerle Creek Reservoir Dam (site GCD-F1).
5. South Fork Rubicon River below Robbs Peak Reservoir Dam (site RPD-F1).
6. South Fork Silver Creek below Ice House Reservoir Dam (sites IHD-F1 and IHD-F2).
7. Silver Creek below Junction Reservoir Dam (site JD-F3).
8. Silver Creek below Camino Reservoir Dam (site CD-F1).
9. Brush Creek below Brush Creek Reservoir Dam (site BCD-F1). This site shall be surveyed once every 10 years after license issuance.
10. South Fork American River (SFAR) below Slab Creek Reservoir Dam (sites SCD-F3 and SCD-F2).

Table 1 lists the names and locations of monitoring sites proposed in this Plan. Proposed monitoring site locations are shown in Figure 1.

Table 1. Upper American River Project Trout Monitoring Site Locations

Stream	Reach	Site Name	Site Length (ft)	Previously Sampled Relicensing Site (Y/N)	Site Description	Sampling Method[2]	UTM (NAD 27)[3] Upper End		UTM (NAD 27)[3] Lower End	
							Easting	Northing	Easting	Northing
Rubicon River	Rubicon Dam	RRD-F1	300[1]	Yes	Upstream of Rubicon Springs	E	0739673	4321141	0739641	4321217
Rubicon River	Rubicon Dam	RRD-F2	296[1]	Yes	Downstream of Rubicon Springs, at Miller Creek confluence	E	0737871	4323186	0737797	4323235
Little Rubicon	Buck Island Dam	BID-F1	368[1]	Yes	At unnamed tributary 1.75 mi downstream from Buck Island Dam	E	0737286	4322730	0737236	4322773
Gerle Creek	Loon Lake Dam	LLD-F3	--[4]	No	Gerle Creek below Jerrett Creek confluence	--[5]	--[4]	--[4]	--[4]	--[4]
Gerle Creek	Loon Lake Dam	LLD-F2	292[1]	Yes	At Rocky Basin Creek confluence	E	0727373	4318635	0727388	4318580
Gerle Creek	Gerle Creek Dam	GCD-F1	283[1]	Yes	Upstream of S.F. Rubicon	E	0725811	4314833	0725777	4314707
S.F. Rubicon	Robbs Peak Dam	RPD-F1	338[1]	Yes	Downstream of Gerle Creek confluence	E	0724551	4314381	0724484	4314327
S.F. Silver Creek	Ice House Dam	IHD-F1	269[1]	Yes	Downstream of Silver Creek campground	E	0727076	4299312	--	--
S.F. Silver Creek	Ice House Dam	IHD-F2	359[1]	Yes	At Bryant Springs	E	0722212	4299361	0722272	4299752
Silver Creek	Junction Dam	JD-F3	--[4]	No	At Jaybird Tunnel Adit	--[5]	--[4]	--[4]	--[4]	--[4]
Silver Creek	Camino Dam	CD–F1	999	Yes	Downstream of Tent Canyon	S (7 habitat units)	0713651	4299908	0713403	4299833

Stream	Reach	Site Name	Site Length (ft)	Previously Sampled Relicensing Site (Y/N)	Site Description	Sampling Method[2]	UTM (NAD 27)[3] Upper End		UTM (NAD 27)[3] Lower End	
							Easting	Northing	Easting	Northing
Brush Creek	Brush Creek Dam	BCD-F1	326[1]	Yes	Confluence with Slab Creek Res.	E	0704309	4297063	--	--
S.F. American	Slab Creek Dam	SCD-F3	--[4]	No	Upstream of Iowa Canyon Creek	--[5]	--[4]	--[4]	--[4]	--[4]
S.F. American	Slab Creek Dam	SCD-F2	243[1]	Yes	Upstream of Rock Creek	E	0693423	4294868	0693423	4294868

[1] Sampling occurred during multiple years; site length is presented as an average

[2] E=Electrofishing, S=Snorkel survey

[3] Universal Transverse Mercator (UTM) coordinate system, North American Datum 1927 (NAD 27)

[4] Not available as site has not yet been set up.

[5] Electrofishing is the expected method, but will be dependent on site characteristics, flow conditions, and whether electrofishing can be performed safely and effectively.

-- Data not available

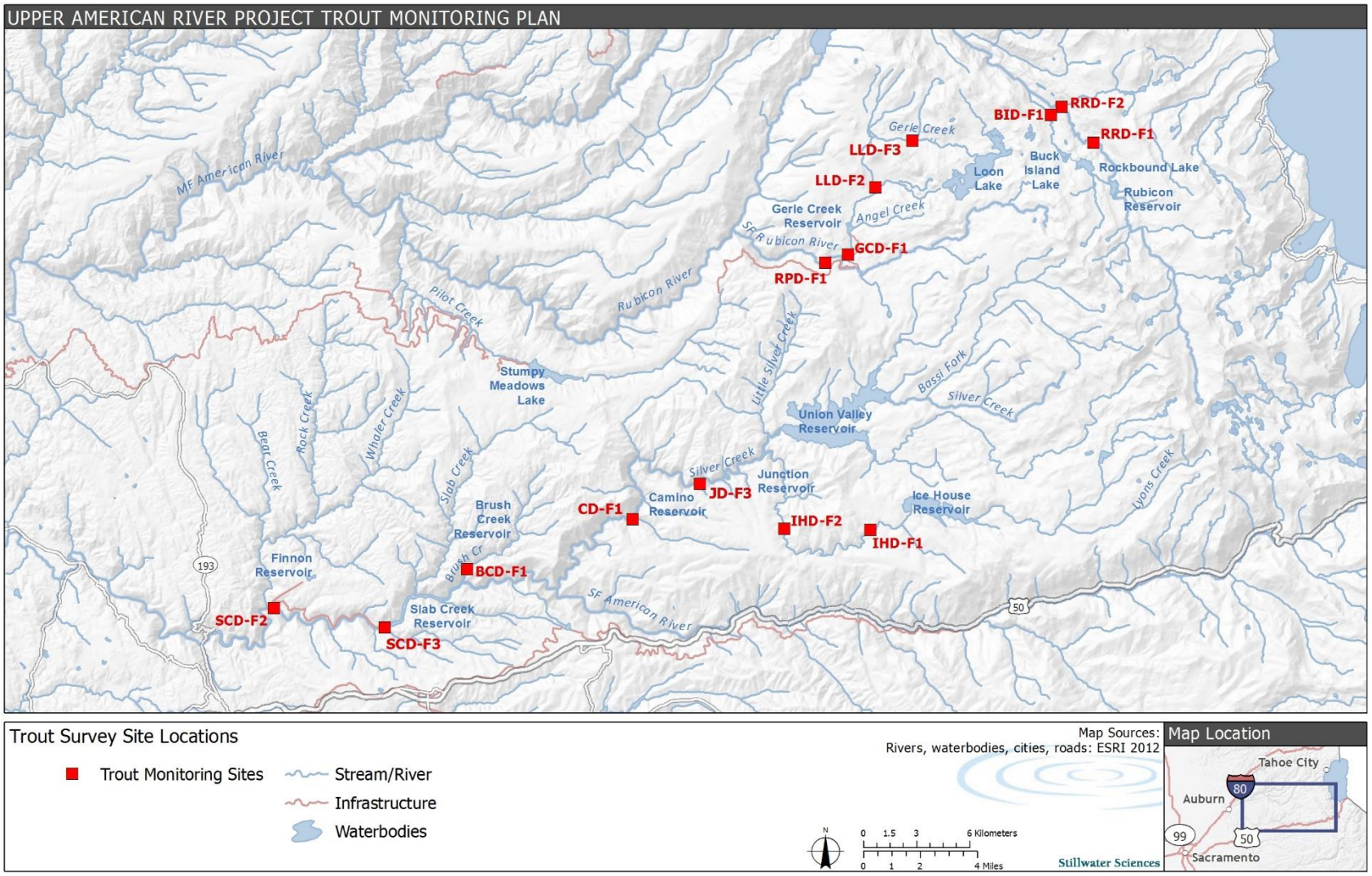

Figure 1. Trout monitoring locations

3.2 MONITORING FREQUENCY

Trout monitoring sites (except site BCD-F1) will be surveyed in license monitoring years 5, 6, 10, 11, 15, 16 (i.e., 2019, 2020, 2024, 2025, 2029, 2030), and thereafter for 2 consecutive years during every 10 years for the term of the license and any extensions, or until the new License is issued. Monitoring site BCD-F1 will be surveyed once every 10 years (i.e., 2024) after license issuance.

4.0 METHODS

Monitoring methods described herein are consistent with those used during relicensing studies (DTA and Stillwater Sciences 2005). As with the relicensing studies, backpack electrofishing methods will be employed at sites that are safely wadeable and that allow for effective sampling, and snorkel survey methods for sites where depth or flow constraints restrict safe and effective electrofishing. All surveys will be conducted during late summer/early fall.

The only methodological difference between this Plan and the relicensing studies lies in the application of either electrofishing or snorkeling at individual sites. At most sites, the sampling method applied under this Plan is consistent with that of the relicensing studies, however, the sampling methods at a few sites could change from electrofishing to snorkeling due to increased flows resulting from the current license release requirements. During the relicensing studies, which were conducted under the previous license release requirements, flow volumes at a few sites were at the upper limit of what can be sampled with backpack electrofishing methods. An attempt will be made to electrofish at all locations where this method was used during relicensing studies and where it can still be performed safely and effectively.

4.1 FIELD SURVEYS

4.1.1 Electrofishing

Electrofishing is proposed for 13 of the 14 monitoring sites (Table 1), provided that environmental conditions allow electrofishing to be performed safely and effectively. Backpack electrofishing will be conducted using a multiple-pass depletion method consistent with procedures described by Reynolds (1996). The upstream and downstream extent of each electrofishing site will be determined in the field using a handheld global positioning system (GPS) device, utilizing the upper and lower end GPS coordinates from the relicensing surveys (Table 1), and photographs of the sites taken during previous sampling efforts. Sites will be approximately 300 feet (ft) long and may be separated into two segments to improve sampling efficiency. Block nets will be used to prevent migration into and out of the sample segment and to facilitate an accurate assessment of the sample population. The electrofishing crew will consist of one to two backpack electrofishers and approximately two netters, depending on the size of wetted

stream channel. Water conductivity of each site will be measured with a meter to help determine the appropriate power output for fish capture. The electrofishing crew will begin sampling at the downstream block net and proceed slowly and deliberately upstream, moving from the center of the channel out to the stream margin, and making simultaneous and parallel passes through the sampling area. As trout are captured (netted), they will be placed in buckets and periodically transferred to a live-car or live-well to be held until the completion of the pass; aeration will be provided as needed. Upon completion of each pass, the following data will be recorded for each individual captured: species identification, total length (TL millimeters [mm]), weight (grams [g]), and, if applicable, notes on the general condition of the fish, including any parasites that may be present. All trout will be inspected for visual markings and fin erosion which could suggest hatchery origin. At each sample location, scale samples will be collected from up to 20 fish of each game species (e.g., rainbow trout, brown trout, brook trout) at a variety of sizes and aged for comparison to confirm age/size class determinations. Once the trout from the final pass are processed, captured fish will be closely monitored and allowed to fully recover in buckets or live wells prior to being returned to slow moving water in the survey segment from which they were captured.

The following site information will be recorded at each survey site: stream name, reach, site name, crew member names, time of day, environmental (weather) conditions, site length, average site width, electrofishing duration, habitat composition (i.e., run, riffle, pool habitat), visually estimated percent of substrate composition (i.e., sand, gravel, cobble, boulder), flow from the reach-specific monitoring gage, water chemistry (i.e., water temperature, dissolved oxygen, and conductivity), and GPS coordinates. Photographs will also be taken to document the specific location of the top and bottom block nets and condition of the site.

4.1.2 Snorkel Surveys

Snorkel surveys for monitoring trout populations is proposed for 1 of the 14 sites (Table 1). Daytime single-pass snorkel surveys will be consistent with procedures described in Thurow (1994) and Dolloff et al. (1996). The extent of each site will be determined in the field using a handheld GPS device, upper and lower end coordinates from the relicensing surveys (Table 1), and photographs of the sites taken during previous sampling efforts. Each site will include several habitat units considered representative of the local channel conditions (i.e., riffle, run, glide, pool). Habitat units within the site will be sampled in their entirety; for example, surveys will begin at the downstream end of the habitat unit identified at the lower coordinate and terminate at the upstream end of the habitat unit identified at the upper coordinate.

The field crew will consist of three to five snorkelers, depending on stream width. Each person snorkeling will be positioned in lanes parallel to one another across the width of the stream. Lane width will be determined on-site, depending on visibility and habitat complexity. Prior to sampling, observers will calibrate estimated fish lengths by viewing variably sized objects of known lengths underwater. Stream visibility will be determined

using a Secchi disk and estimated by the average of horizontal measurements obtained looking into and away from the sun. Divers will enter the stream downstream from the area to be sampled and briefly rest to acclimate and allow any fish in the area to resume normal behavior. Snorkeling will typically be conducted in the upstream direction, with divers moving in a zig-zag pattern within their lane in an effort to enumerate all trout present. In shallow-water habitats with fast velocities, divers will proceed upstream by pulling themselves along the substrate, possibly aided by the use of a pull rope. If stream flow does not permit snorkeling upstream, surveyors will move as slowly as possible in the downstream direction, taking care not to startle fish.

Snorkelers will identify and count trout observed in their lane while moving upstream at a slow, even, and uniform pace. Trout will be counted as they pass below or to the side of each observer. Trout TL will be visually estimated by each observer, and each trout assigned to a particular size class (e.g., 25–50 mm, 50–75 mm, 75–100 mm, … 250–300 mm, 300–350 mm), consistent with previous relicensing study size classes. Trout will be identified to species, estimated to size class, and the data recorded on a dive slate. Snorkelers will communicate as best as possible in an effort to avoid potential double-counting.

Directly following each survey, start and end times will be noted, data on the dive slates will be transcribed to a data sheet, and site information will be recorded. General site information will include: stream name, reach, site name, number of habitat units, habitat composition (i.e., riffle, run, or pool habitat), site length, average site width, visually estimated percent of substrate composition (e.g., sand, gravel, cobble, boulder), flow from the reach-specific monitoring gage, percent cover, crew member names, time of day, environmental (weather) conditions, underwater visibility, water chemistry (i.e., average water temperature, dissolved oxygen, and conductivity), and GPS location. Photographs will also be taken to document the specific location and condition of the site.

4.2 ANALYSIS

Data collected during trout monitoring will be entered into a database for data reduction, tabulation, and summary. Data collected in this study will be compared with data collected during previously conducted studies (e.g., DTA and Stillwater Sciences 2005).

Trout abundance and size distribution will be evaluated at all survey sites to determine changes over time. Length-frequency histograms will be developed for each trout species observed or captured and used to estimate size and age distribution at each survey site. Breaks and modalities, within the histograms, will be evaluated and compared to the subsample of aged scales collect at each study site and relevant literature on trout growth (Moyle 2002).

Trout densities (number per acre), biomass (pounds per acre), and 95 percent confidence intervals will be computed for each electrofished site using the Zippin estimator within the multiple-pass regression analysis software developed by Van Deventer and Platts (1989).

Data collected during snorkel surveys will be used to estimate minimum trout densities for each site. Trout biomass will not be calculated for sites that are snorkel surveyed.

The number of catchable size trout (greater than 152 mm [6 inches] in TL) per stream mile will be calculated for each survey site. If the number of catchable size trout at a site are so low that a population estimate cannot be obtained, a minimum estimate of the number of catchable trout per mile will be extrapolated from the number of trout actually captured rather than from a study site population estimate.

Trout condition will be estimated for each electrofishing site using the weight-to-length relationship method developed by Ricker (1975). Condition factor, a measure of nutritional state, will be calculated for each trout using TL and weight measurements.

5.0 REPORTING

Each calendar year, by April 1, SMUD will schedule and facilitate an Annual Review of Ecological Conditions meeting with the Resource Agencies (i.e., CDFW, USFS, USFWS, and SWRCB) to review and discuss the results of implementing this Plan (FERC 2014). The report will be provided at least two weeks prior to the Annual Review of Ecological Conditions.

SMUD will file with FERC by June 30 of each year an annual report fully describing the monitoring efforts of the previous calendar year. Results of the trout monitoring will be provided in the Project reports and will include a discussion of the current trout populations, as well as any trends observed and possible relationships to the modified flow regime. SMUD will provide copies of the annual report to the Resource Agencies. The Resource Agencies will have at least 30 days to review and comment on the draft report prior to filing with FERC.

6.0 LITERATURE CITED

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Attachment 1
State Water Resources Control Board section 401 Water Quality Certification for the UARP

Condition 8.A Fish Populations

Within two years of license issuance, the Licensee shall develop a fish population monitoring plan in consultation with USFS, CDFW, USFWS, and the State Water Board that incorporates, at a minimum, the elements detailed below. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: The Licensee shall conduct electro-fishing and/or snorkeling surveys (in the same manner as the studies conducted in 2002-2003 by the Licensee) during late summer/fall for: 1) brown trout in Gerle Creek below Loon Lake Reservoir Dam Reach only; 2) hardhead sampling in SF American River below Slab Creek Reservoir Dam Reach only; and 3) rainbow trout at all stations listed below.

Locations: The sampling locations are as follows:

- 8.A.1. Rubicon River below Rubicon Reservoir Dam (upper and lower sample section of sites RRD-F1 and RRD-F2).
- 8.A.2. Little Rubicon River below Buck Island Reservoir Dam (upper sample section of site BID-F1).
- 8.A.3. Gerle Creek below Loon Lake Reservoir Dam (upper and lower sample section of sites LLD-F1 and LLD-F2).
- 8.A.4. Gerle Creek below Gerle Creek Reservoir Dam (upper and lower sample section of site GCD-F1).
- 8.A.5. SF Rubicon River below Robbs Peak Reservoir Dam (upper and lower sample section of site RPD-F1).
- 8.A.6. SF Silver Creek below Ice House Reservoir Dam (upper and lower sample section of sites IHD-F1 and IHD-F2).
- 8.A.7. Silver Creek below Junction Reservoir Dam (upper and lower sample section of site JD-F1).
- 8.A.8. Silver Creek below Camino Reservoir Dam (upper and lower sample section of site CD-F1). Surveyed once every 10 years after license issuance.)
- 8.A.9. Brush Creek below Brush Creek Reservoir Dam (site BCD-F1). (This site shall be surveyed once every 10 years after license issuance.)
- 8.A.10. SF American River below Slab Creek Reservoir Dam (electro-fishing at upper and lower sample section of site SCD-F2). Hardhead

snorkeling shall be conducted from immediately downstream of Mosquito Road Bridge up to and including site SCD-F2.

Timing: Rainbow trout and brown trout: Years 5, 6, 10, 11, 15, 16, and thereafter for two consecutive years every 10 years for the term of the license and any extensions. Hardhead: Years 2, 3, 5, 6, 10, 11, 15, 16 and thereafter for two consecutive years every 10 years for the term of the license and any extensions.

Attachment 2
U.S. Department of Agriculture, Forest Service section 4 (e) Condition for the UARP

Condition No. 31 Fish Populations
Within 2 years of license issuance, the licensee shall develop a fish population monitoring plan in consultation with FS, *CDFG, FWS, and SWRCB*. The licensee shall provide FS, *CDFG, FWS, and SWRCB* a 90-day review and approval period for the monitoring plan prior to implementation. The licensee shall implement the plan upon approval.

Method: Electrofishing and/or snorkeling (as conducted in 2002-2003 by the licensee) during late summer/fall for rainbow trout at all stations listed below, brown trout in the Gerle Creek below Loon Lake Reservoir Dam Reach only, and hardhead sampling in SFAR below Slab Creek Reservoir Dam Reach only:

- Rubicon River below Rubicon Reservoir Dam (upper and lower sample section of sites RRD-F1 and RRD-F2).
- Little Rubicon River below Buck Island Reservoir Dam (upper sample section of site BID-F1).
- Gerle Creek below Loon Lake Reservoir Dam (upper and lower sample section of sites LLD-F1 and LLD-F2).
- Gerle Creek below Gerle Creek Reservoir Dam (upper and lower sample section of site GCD-F1).
- South Fork Rubicon River below Robbs Peak Reservoir Dam (upper and lower sample section of site RPD-F1).
- South Fork Silver Creek below Ice House Reservoir Dam (upper and lower sample section of sites IHD-F1 and IHD-F2).
- Silver Creek below Junction Reservoir Dam (upper and lower sample section of site JDF1).
- Silver Creek below Camino Reservoir Dam (upper and lower sample section of site CDF1).
- Brush Creek below Brush Creek Reservoir Dam (site BCD-F1). This site shall be surveyed once every 10 years after license issuance.
- SFAR below Slab Creek Reservoir Dam (electrofishing at upper and lower sample section of site SCD-F2). Hardhead snorkeling shall be conducted from immediately downstream of Mosquito Road Bridge to and including site SCD-F2.

Frequency: Rainbow trout and brown trout: Years 5, 6, 10, 11, 15, 16, and thereafter for 2 consecutive years during every 10 years for the term of the license. Hardhead: Years 2, 3, 5, 6, 10, 11, 15, 16 and thereafter for 2 consecutive years during every 10 years for the term of the license.
Rationale: Sampling for 2 years in the beginning of each 5-year period provides a mean of 2 years for comparison to the ecological resource biomass objectives and reduces

electroshocking effects to individuals, with sufficient response time to the new streamflow regimes. Hardhead sampling in years 2 and 3 will provide evaluation of initial response to the new flow regime.

Attachment 3
U.S. Department of Agriculture, Forest Service section 4 (e)
Condition No. 14 for the Slab Creek Flow Facility Project License Amendment

Condition No. 14 – South Fork American River Gravel Augmentation Plan

Prior to undertaking any activities on National Forest System lands, licensee shall complete a South Fork American River Gravel Augmentation Plan that is approved by FS. Licensee shall submit the plan to FS at least 180 days prior to undertaking activities on National Forest System lands. The plan shall be developed in consultation with FS, CDFW, FWS, and SWRCB. The plan shall include measures to enhance trout spawning habitat in the ¼-mile reach between Slab Creek Reservoir Dam and the new Slab Creek Flow Facility. The plan shall focus on increasing the amount of spawning gravel in the 600-foot segment between the large pool and new powerhouse. The size of the gravel pile is expected to be 200-300 cubic yards; its replenishment frequency will be determined by the results of annual monitoring of the pile size and gravel distribution in the 600-foot section of the SFAR. The plan shall also include a proposal for introducing gravel and monitoring of gravel entrainment and distribution, water quality (in-situ and chemistry), benthic macroinvertebrate (BMI), algae, and fish population monitoring sites within the ¼-mile reach, thereby augmenting the monitoring sites already established for the same resources throughout the UARP. Once the plan is approved by FS, it shall be filed with FERC.

157 FERC ¶ 62,193

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Sacramento Municipal Utility District Project No. 2101-137

ORDER MODIFYING AND APPROVING TROUT MONITORING PLAN AS PART OF THE FISH POPULATION MONITORING PLAN UNDER LICENSE ARTICLE 401(A)

(Issued December 14, 2016)

1. On November 1, 2016, Sacramento Municipal Utility District, licensee for the Upper American River Hydroelectric Project No. 2101, filed a Trout Monitoring Plan with the Federal Energy Regulatory Commission (Commission), pursuant to Article 401(a) of the project license.[1] The project is located on the Rubicon River, Silver Creek, and South Fork American River in El Dorado and Sacramento counties, California. The project occupies, in part, federal lands administered by the U.S. Forest Service (Forest Service).

Background

2. Article 401(a), in part, requires the licensee to file, for Commission approval, a Fish Population Monitoring Plan within 28 months of license issuance, or November 23, 2016. The Fish Population Monitoring Plan is also required by condition no. 8(a) of the project's Water Quality Certification (WQC) and condition no. 31.1 of the Forest Service's 4(e) conditions.[2] Further, condition no. 14 of the project's revised Forest Service's conditions incorporated into the license by the Commission's November 9, 2016 Order Amending License, Revising Project Description and Approving Exhibit F Drawings,[3] requires trout monitoring as part of a required South Fork Gravel

[1] Order Issuing New License (148 FERC ¶ 62,070), issued July 23, 2014.

[2] The WQC and the Forest Service 4(e) conditions were incorporated into the project license via appendices A and B, respectively.

[3] 157 FERC ¶ 62,106.

Augmentation Plan.[4] Therefore, the licensee's filing is not only intended to satisfy the aforementioned requirements, but also the trout population monitoring component of revised 4(e) condition no. 14 and approved South Fork Gravel Augmentation Plan. The Fish Population Monitoring Plan is intended to monitor trout and hardhead populations; however, instead of filing a single plan, the licensee has divided the requirement up between two separate plans due to a scheduling conflict between the window for hardhead monitoring and the deadline for the Fish Population Monitoring Plan[5]: the Trout Monitoring Plan and the Hardhead Monitoring Plan. The Hardhead Monitoring Plan was filed and approved on August 12, 2016.[6] Hence, the subject of this order is the Trout Monitoring Plan (Plan).

3. The intent of the Plan is to provide information on trout populations in the project area including trout abundance, size and age class distribution, and the condition of the population. Data collected under the Plan is meant to be compared to previous trout surveys to identify changes to the trout population over time. The licensee must develop the Plan in consultation with the California State Water Resources Control Board (California WRCB), Forest Service, U.S. Fish and Wildlife Service (FWS), and the California Department of Fish and Wildlife (California DFW) and receive approval of the Plan from the California WRCB and Forest Service.

Licensee's Plan

4. The licensee's Plan includes provisions to monitor trout populations and their habitat at 14 sites within 10 reaches in the project area. In order to effectively compare pre- and post-license conditions, the licensee proposes to conduct monitoring at some of the same sites that it completed its pre-licensing fish surveys at in 2002 and 2003.[7] Sampling would occur in 2019, 2020, 2024, 2025, 2029 and 2030 and thereafter for two

[4] The South Fork Gravel Augmentation Plan was approved by the Commission in ordering paragraph (H) of its November 9, 2016 order.

[5] The license requirements state that hardhead monitoring must occur during the second year of license issuance (2016). The monitoring window for headhead is August/September, which was prior to the November 23, 2016 filing deadline.

[6] Order Approving Hardhead Monitoring Plan as Part of the Fish Population Monitoring Plan under License Requirement 401(a) (156 FERC ¶ 62,118).

[7] Three of these sites (BID-F1, LLD-F1/LLD-F3, and JD-F3) have been slightly modified due to site access issues relating to private land ownership. Additionally, a new site was created, SCD-F3, to fulfill the requirements of the Gravel Augmentation Plan.

consecutive years every 10 years for the term of the license. One site in particular, BCD-F1, would be monitored during the aforementioned years and then once every 10 years.

5. At each site, the licensee would either electrofish or snorkel the designated stream reach (300 meters in length), with electrofishing being the preferred method and snorkeling being reserved for sites that are unsafe for electrofishing. The licensee would identify all fish captured and record total length, and the general condition of the fish, including the presence of any parasites. Additionally, scale samples would be obtained from up to 20 fish of each game species (rainbow trout, brook trout, and brown trout) at a variety of sizes and ages for comparison to confirm age/size class determinations. The following information would be obtained about the sampling site: stream name and reach, site name, average site width, electrofishing duration, habitat composition, visual estimates of percent of substrate composition, flow from the reach-specific monitoring gage, in-situ water quality data, and GPS coordinates. Finally, the licensee would photograph the site from upstream and downstream locations.

6. If snorkeling is necessary, the licensee would sample the reach at several habitat units that are representative of the local channel conditions. Each habitat unit would be sampled in its entirety. Similar to the electrofishing sites, the licensee would collect site-specific data to assess habitat and water quality and also photograph the site from various vantage points. Additional information regarding the snorkeling survey is in the Plan.

7. Data collected during the monitoring efforts would be entered into a database by the licensee for tabulation and summary and then compared to previous surveys conducted both prior to licensing and under the Plan. The licensee proposes to use the trout abundance and size distribution to evaluate changes over time at each site. The licensee would develop length-frequency histograms for each species and compare any breaks and modalities against the aged scale samples. Additional data analyzed under the Plan would include trout biomass, trout densities, the number of catchable size trout, and overall condition.

8. The licensee would present its monitoring results at the Annual Review of Ecological Conditions meeting with the FWS, Forest Service, California DFW and California WRCB, which is held by April 1. At least 2 weeks prior to the meeting, the licensee would provide its monitoring report to the agencies to review. The report would include a description of monitoring efforts undertaken during the previous calendar year. The results of all monitoring efforts would be also included, as well as a discussion of the current condition of trout populations and any trends as they relate to potential project impacts. The licensee would discuss the report with the agencies at the meeting. Following the meeting, the licensee would give the agencies 30 days to provide additional comments on the draft report before finalizing it and filing it, along with any agency comments, with the Commission by June 30 of the year following monitoring.

Under this schedule, the first report would be filed with the Commission by June 30, 2020.

Agency Consultation

9. The licensee provided the Plan to the resource agencies for review on July 22, 2016. The California DFW provided comments and the licensee revised its Plan to address them. By letters dated August 11 and October 17, 2016, the Forest Service and California WRCB, respectively, approved the Plan.

Discussion and Conclusions

10. The activities described in the licensee's Plan should provide valuable information regarding the composition and health of trout populations in the project area, as well as the quality of habitat available. By collecting this data at sites that were monitored prior to the implementation of the new license conditions, the licensee should be able to assess the response of the trout populations to the new flow releases from the reserviors and determine whether any changes to the flow regime are necessary over the course of the license. The reporting component of the Plan should ensure that the licensee is in regular contact with the resource agencies regarding the implementation and findings of the Plan, which should provide a solid foundation for any flow management discussions that could arise in the future resulting from this Plan. Further, the reports that the licensee proposes to file with the Commission should keep the Commission apprised of activities taking place under the Plan as well as the effect that the new flow regime is having on the trout population in the project area. The Plan was developed in consultation with the necessary resource agencies and meets the agencies' needs. Inasmuch, the Plan meets the requirements of the aforementioned requirements and should be approved. We note, however, that the Commission should reserve the right to require additional monitoring based on the monitoring results.

The Director orders:

(A) Sacramento Municipal Utility District's Trout Monitoring Plan (Plan), filed November 1, 2016, pursuant to Article 401(a) of the license for the Upper American River Hydroelectric Project No. 2101, as modified in ordering paragraph B, is approved.

(B) The Commission reserves the right to require additional monitoring based on the results of monitoring conducted under the Plan.

(C) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 825*l* (2012), and the Commission's regulations at 18 C.F.R. § 385.713 (2016). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Thomas J. LoVullo
Chief, Aquatic Resources Branch
Division of Hydropower
Administration and Compliance

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