

**California Sportfishing Protection Alliance – Trout Unlimited – American Rivers –
American Whitewater - Merced River Conservation Committee – Friends of the River-
Golden West Women Flyfishers – The Sierra Club**

July 22, 2014

By electronic filing

Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, D.C. 20426

Re: Merced River Hydroelectric Project, FERC Project No. 2179

Comments on Ready for Environmental Analysis and Recommendations of California Sportfishing Protection Alliance, Trout Unlimited, American Rivers, American Whitewater, Merced River Conservation Committee, Friends of the River, Golden West Women Flyfishers and the Sierra Club

Dear Ms. Bose:

Attached for filing with the Federal Energy Regulatory Commission please find the response to the “Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Ready for Environmental Analysis, and Soliciting Comments, Recommendations, Preliminary Terms and Conditions, and Preliminary Fishway Prescriptions” of California Sportfishing Protection Alliance, Trout Unlimited, American Rivers, American Whitewater, Merced River Conservation Committee, Friends of the River, Golden West Women Flyfishers and The Sierra Club (collectively “Conservation Groups”) in the above-captioned proceeding.

Please contact me with any questions.

Sincerely,



Chandra Ferrari
California Water Policy Director
Trout Unlimited

Enclosure

Cc: Service List, Project No. 2179

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

Merced Irrigation District)
Merced River Hydroelectric Project) P-2179-043

CONSERVATION GROUPS' COMMENTS AND RECOMMENDATIONS
READY FOR ENVIRONMENTAL ANALYSIS

July 22, 2014

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Via electronic filing

Dear Ms. Bose:

California Sportfishing Protection Alliance, Trout Unlimited, American Rivers, American Whitewater, Merced River Conservation Committee, Friends of the River, Golden West Women Flyfishers and the Sierra Club (hereinafter "Conservation Groups") respectfully respond to the Notice of Ready for Environmental Analysis for the relicensing of Project 2179, the Merced River Hydroelectric Project operated by Merced Irrigation District (Merced ID or Licensee).¹ We provide a suite of recommendations for the Project under Section 10(a) of the Federal Power Act (FPA) and comments regarding the Federal Energy Regulatory Commission's (FERC or Commission) Environmental Impact Statement (EIS) for the Project under the National Environmental Policy Act (NEPA).

Background

The Conservation Groups have been active relicensing participants in the relicensing of the Project since before the formal commencement of the Integrated Licensing Process. Several of the Conservation Groups have participated in dozens of face-to-face relicensing meetings since 2008. The numerous filings submitted by Conservation Groups in this proceeding are

¹ The Commission issued the "Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Ready for Environmental Analysis, and Soliciting Comments, Recommendations, Preliminary Terms and Conditions, and Preliminary Fishway Prescriptions" for the Merced River Hydroelectric Project (e-Library no. 20140324-3026) and Merced Falls Hydroelectric Project (e-Library no. 20140324-3024) on March 24, 2014. On May 15, 2014, the Commission extended the period for comment via notice to FERC participants to July 22, 2014. See e-Library no. 20140507-3034.

enumerated in the Petition for Declaratory Relief filed into the FERC docket for this proceeding by several of the Conservation Groups.²

On February 26, 2012, Merced ID filed a Final License Application (FLA) with the Commission for the Merced River Hydroelectric Project, FERC Project P-2179 (Project).³ On April 23, 2014, Merced ID filed an Amended Final License Application for the Project.⁴ The Project's facilities are located on the main stem of the Merced River and they generate approximately 350,956 gigawatt-hours of power annually.

The Commission issued the "Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Ready for Environmental Analysis, and Soliciting Comments, Recommendations, Preliminary Terms and Conditions, and Preliminary Fishway Prescriptions" for the Project on March 24, 2014.⁵ On May 15, 2014, the Commission extended the period for comment via notice to FERC participants.⁶

Summary of Key Comments and Recommendations

Conservation Groups recommend that Merced ID and the Commission consider the following changes and additions to ensure the legal sufficiency of the Commission's NEPA analysis (*see* 18 C.F.R. § 380.3) and to ensure that the new license is in the public interest and best suited to a comprehensive plan of development for the river consistent with Section 10(a) of the FPA (*see* 16 U.S.C. § 803(a)(1)).

- 1) Implementation of Conservation Groups' Flow Proposal as a comprehensive mechanism to address impacts to instream resources, strategically and flexibly manage reservoir storage levels and minimize effects to water deliveries.
- 2) Implementation of Conservation Groups' Anadromous and Resident Fish Passage Measure as a means to partially mitigate the Project's impacts on anadromous resources.
- 3) Formation of the Merced River Ecological Resource Group as the primary forum to conduct post-licensing monitoring, research and consultation.
- 4) Addition of measures related to large woody debris and gravel supplementation pursuant to Conservation Groups' recommendations.
- 5) Adoption of Amended Recreational Facilities Plan consistent with minor modifications recommended by Conservation Groups and fish and wildlife agencies.
- 6) Implementation of Conservation Groups' measure for a Native Salmonid Conservation Management Program to place genetically appropriate anadromous or potadromous salmon and/or steelhead in the upper Merced River.
- 7) Inclusion of an alternative that examines reoperation of the fish ladder at Crocker-Huffman Diversion Dam and reintroduction of salmon and/or steelhead to the upper Merced River watershed.

² *See* e-Library no. 20120604-5053.

³ *See* e-Library no. 20120227-5057.

⁴ *See* e-Library no. 20140423-5220.

⁵ *See* e-Library nos. 20140324-3026 and 20140324-3024.

⁶ *See* e-Library no. 20140507-3034.

- 8) Inclusion of an alternative that analyzes changes to Project operations and condition of aquatic resources in response to flow requirements and export limitations required to meet Delta flow objectives pursuant to the State Water Resources Control Board's ongoing update of the Bay-Delta Water Quality Control Plan.

Substantive Comments and Recommendations

I. The Conservation Groups' Flow Recommendation: A Balanced Approach that Improves Instream Conditions, Minimizes Effects to Water Deliveries and Strategically Manages Reservoir Storage.

A. Conservation Groups' Flow Proposal: Summary

Conservation Groups recommend a flow requirement for the lower Merced River that is based on the following key elements:

- Flow compliance point is Shaffer Bridge; Licensee shall maintain the current buffer, and not be allowed a firm flow requirement that is lower than a target flow.
- Licensee will use water-year types that apply a 75% exceedence Merced 60-20-20 Index; each year, the water-year type shall be modified with the issuance of DWR Bulletin 120 in February, March, April, and May.
- Licensee is required to release 60% of unimpaired inflow to Lake McClure to the lower Merced River in specified months.
- Licensee will apply 60% of unimpaired inflow to Lake McClure February through June in Wet and Above Normal years.
- Licensee will apply 60% of unimpaired inflow to Lake McClure to a subset of February through June in Below Normal and Dry years; months in which the percent-of-unimpaired requirement is eliminated revert to the November through January flow requirement for the water-year type of that month.
- Licensee will substitute a 20,000 AF Block of Water flow requirement in place of a percent-of-unimpaired flow requirement in Critically Dry years.
- In some dry-year sequences, Licensee's February through June flow requirements are different than in single Below Normal, Dry, and Critically-Dry years.
- For all months in which the percent-of-unimpaired flow requirement is in effect, the floor minimum flow is 220 cfs in Wet, Above Normal, and Below Normal months and 180 cfs in Dry months.
- Licensee will release summer (July through October) base flows of 150-200 cfs at Shaffer Bridge, depending on water-year type. These flows will generally maintain summer water temperatures to protect adult and juvenile *O. mykiss* from Crocker-Huffman Dam downstream to Snelling. Summer flow requirements were formulated based on the knowledge that Merced ID is required to make additional releases from Crocker-Huffman pursuant to the Cowell Agreement between Merced ID and riparian diverters downstream of Crocker-Huffman.
- When storage at Lake McClure drops below 130,000 AF, Licensee must stop irrigation diversions.

- The flow requirement at Shaffer Bridge becomes 100 cfs so long as Lake McClure storage remains below 130,000 AF.
- Licensee will release a fall attraction pulse of 12,500 AF in all years.
- Licensee will make full deliveries of 15,000 AFY to wildlife refuges in all years.
- Licensee will meet November through January flow requirements roughly equivalent to the flows currently required by the Davis-Grunsky Agreement (220 cfs in Wet, AN, and BN years; 180 cfs in Dry and CD years).
- Licensee will limit irrigation deliveries to a percent of baseline demand in each year, as specified.

The specific components of this measure are enumerated and described in detail in section (C) below.

B. Conservation Groups' Flow Proposal: Development

In developing a flow proposal for the lower Merced River, the Conservation Groups attempted to work within the general framework that the State Water Resources Control Board (State Board) has established for its ongoing San Joaquin Flow and Salinity proceeding, otherwise known as Phase I of the Update of the Bay-Delta Water Quality Control Plan. This framework centers flow requirements on release of a percent of the February-June unimpaired inflow to major San Joaquin tributary reservoirs, including Lake McClure on the Merced River.

In its “Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives” (February, 2012; “Technical Report”), the State Board concluded:

The State Water Board has determined that higher and more variable inflows during the February through June time frame are needed to support existing salmon and steelhead populations in the major SJR tributaries to the southern Delta at Vernalis. This will provide greater connectivity to the Delta and will more closely mimic the flow regime to which native migratory fish are adapted. Water needed to support sustainable salmonid populations at Vernalis should be provided on a generally proportional basis from the major SJR tributaries (Stanislaus, Tuolumne, and Merced Rivers).⁷

. . . A more natural flow regime is anticipated to improve a number of ecosystem attributes such as (but not limited to): 1) native fish communities; 2) food web; 3) habitat; 4) geomorphic processes; 5) temperature; and 6) water quality.⁸

In this Technical Report, the State Board also cites to its earlier work:

⁷ State Water Resources Control Board, “Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives” (February, 2012). Prepared in support of the Substitute Environmental Document for Phase I of the update of the Bay-Delta Water Quality Control Plan. p. 3-1. Available at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/scientific_report.pdf

⁸ *Id.*, p. 3-41.

In its 2010 report on *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem (Delta Flow Criteria Report)*, the State Water Board determined that approximately 60% of unimpaired flow during the February through June period would be protective of fish and wildlife beneficial uses in the SJR.⁹

The State Board released its first Substitute Environmental Document (SED) for Phase I on December 31, 2012. Numerous parties submitted extensive comments, and the State Board subsequently announced that it would revise and recirculate a second SED. This second SED has not yet been released but it is expected later this year.¹⁰

One of the aspects of the first SED that particularly caught the attention of Conservation Groups was the rigid adherence to the same percent-of-unimpaired flow requirements in all of the same months across all years. This limited the opportunity to realize the full benefits of February-June flows in wetter years because identical percentages caused the Merced system to run out of water in dry years. In response to this observation, Conservation Groups used the water-balance model developed by Merced ID for the relicensing to incrementally evaluate both fixed and mixed percentages of unimpaired flow requirements for the Merced River in all or just some of the February–June months.

Conservation Groups also extensively reviewed the model runs performed by consultants to Merced ID of scenarios requested by Relicensing Participants and provided by the California Department of Fish and Game on May 25, 2012. While that model run (“DFG052512”) gave a first cut rough analysis of the water balance, it was unrepresentative of how the District would actually operate the system under a percent-of-unimpaired requirement. In drier years and dry-year sequences, DFG052512 as modeled pulled water out of storage to meet maximum allowed demand until storage was reduced to a 130,000 AF minimum pool, at which time the model cut

⁹ *Id.*, p. 3-53. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem (“The Delta Flow Criteria Report”) is available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf.

¹⁰ In consulting with staff from the State Board, it is our understanding that State Board staff intends to submit the recirculated SED into the FERC record once it is released. State Board staff also intends to use the combined records from the present relicensing and from Phase I as the basis for issuing its §401 Water Quality Certification for the relicensing.

In a Petition for Declaratory Relief filed in the P-2179 docket on June 1, 2014 (*see* eLibrary 20120604-5053), many of the Conservation Groups petitioned the Commission to incorporate into the FERC proceeding information gathered in the Phase I process, and to consider alternative flows that may be required by the State Board:

the Commission should require OEP Staff to commit to incorporate the information gathered by the State Water Board into Staff’s NEPA Document so that the Commission has substantial evidence on which to base its findings regarding alternative project releases that will allow Merced ID to comply with the new flow objectives and still balance power, water supply, and fish and wildlife uses in a manner that best serves the public interest. (p. 29)

We strongly repeat that recommendation now, and have constructed our flow recommendations to meet the purposes of both proceedings.

off diversions completely.¹¹ Although diversion limits according to water-year type were set in this model run, these limits were inadequate to preserve storage in dry years and dry-year sequences.

Conservation Groups consulted with Mr. Lee Bergfeld of MBK Engineers on May 23, 2014, to evaluate potential adjustments to the model that would aid in adding flexibility to model variables. Mr. Bergfeld developed the water-balance model for the relicensing. Mr. Bergfeld helped Conservation Groups to establish a “lookup” in the model that allowed Conservation Groups to model annual reductions of irrigation deliveries on a percentage basis. This approach maintains the relative proportion of irrigation deliveries that are delivered on a month-to-month basis, but pre-sets the overall annual irrigation deliveries so there is no unrealistic scenario of full deliveries for part of the season and zero deliveries for the rest. This approach also allows irrigation deliveries to be balanced against instream flow and reservoir storage.

In speaking with Conservation Groups, Mr. Bergfeld also confirmed that it would be significant work to change the model in order to create a storage rule curve that would drive diversions; MBK recommended instead that Conservation Groups construct rules to adjust irrigation deliveries and instream flows and iteratively evaluate end of year storage (e.g. end of September or end of October storage).

Mr. Bergfeld also stated that it would be significant work to add additional rules for water-year types (currently there are two options: the water year type designation proposed by Merced ID in its Amended FLA, and the approach recommended by California Department of Fish and Wildlife, labeled in model version 5 as the “Hughes” option). Conservation Groups therefore elected to use the more conservative option of a “Merced 60-20-20” water year type designation, although we believe that using 90% exceedence in February and March is excessively conservative.¹²

C. Conservation Groups’ Flow Proposal for the Lower Merced River

1. February-June Flows

¹¹ This is similar to the current FERC license condition that requires MID to discontinue releases from Lake McClure, other than those required to meet minimum instream flows, once Lake McClure storage goes below 115,000 AF.

¹² The option recommended by the California Department of Fish and Wildlife bases water year types on estimated annual inflow to Lake McClure, without considering storage or the previous year’s conditions. The existing San Joaquin Index that is used to determine flows for the now-ended Vernalis Adaptive Management Program, and that is used by the California State Water Resources Control Board in the current Water Quality Control Plan, is based on 75% exceedence for February through May. The San Joaquin Index considers April-July inflow (60% of weighting), October-March inflow (20% of weighting), and the previous year’s index (20% of weighting). We agree that a water year type index that includes the previous year’s conditions (which in some measure factors in storage), and an index specific to the Merced River (as opposed to the San Joaquin Index which also looks at conditions on the Tuolumne and Stanislaus rivers), have strong arguments in their favor. However, 90% exceedence is more appropriately reserved for short-term drought management, and in February and March has extremely wide error bars. The uncertainty inherent in early year forecasting is already addressed by using the relatively conservative 75% exceedence, and monthly adjustments of water year type can pick up outlier years where precipitation greatly falls off.

I. Wet years

1. Meet 60% of February – June unimpaired flow at Shaffer Bridge. This is always applied in Wet years.
2. 220 cfs is a February – June default floor value if 60% of unimpaired drops lower than that in a Wet year.
3. Irrigation deliveries in a Wet year are 75% of demand.

II. Above Normal (AN) years

1. Meet 60% of February – June unimpaired flow at Shaffer Bridge. This is always applied in AN years.
2. 220 cfs is a February – June default floor value if 60% of unimpaired drops lower than that in an AN year.
3. Irrigation deliveries in an AN year are 75% of demand.

III. Below Normal (BN) years not immediately preceded by 2 Dry or CD years in any combination

1. Meet 60% of February – May unimpaired flow at Shaffer Bridge. June required flow is 220 cfs at Shaffer Bridge.
2. 220 cfs at Shaffer Bridge is a February – May default floor value if 60% of unimpaired drops lower than that in a BN year.
3. Irrigation deliveries in a BN year not immediately preceded by 2 Dry or CD years in any combination are 75% of demand.

IV. BN years immediately preceded by 2 Dry or CD years in any combination

1. Meet 60% of March – May unimpaired flow at Shaffer Bridge. February and June required flow is 220 cfs at Shaffer Bridge.
2. 220 cfs at Shaffer Bridge is a March – May default floor value if 60% of unimpaired drops lower than that in a BN year immediately preceded by 2 Dry or CD years in any combination.
3. Irrigation deliveries in a BN year immediately preceded by 2 Dry or CD years in any combination are 75% of demand.

V. Dry years immediately preceded by a Wet, AN, or BN year

1. Meet 60% of March–April unimpaired flow at Shaffer Bridge. February, May and June required flow is 180 cfs at Shaffer Bridge.
2. 180 cfs at Shaffer Bridge is a March–April default floor value if 60% of unimpaired drops lower than that in a Dry year immediately preceded by a Wet, AN, or BN year.
3. Irrigation deliveries in the first Dry year immediately preceded by a Wet, AN, or BN year are 60% of demand.

VI. Dry years immediately preceded by a Dry or Critically Dry (CD) year

1. Dry years immediately preceded by a Dry or CD year will be considered to be CD years.

VII. Critically Dry years immediately preceded by a Wet, AN, or BN year

1. February–June required flow is 180 cfs at Shaffer Bridge.
2. Provide an additional 20,000 acre-feet of water in the March 15 through May 15 period, with release specifics to be determined by an implementation committee.¹³
3. Irrigation deliveries in the first Critically Dry year immediately preceded by a Wet, AN, or BN year are 50% of demand.

VIII. Critically Dry years immediately preceded by a Dry or CD year

1. February–June required flow is 180 cfs at Shaffer Bridge.
2. Provide an additional 20,000 acre-feet of water in the March 15 through May 15 period, with release specifics to be determined by an implementation committee.
3. Irrigation deliveries in the first Critically Dry year immediately preceded by a Dry or CD year are 50% of demand.

IX. Off-ramps and exceptions (February–June) in CD years

1. If storage in McClure is less than 200,000 AF on March 1, plan to provide only an additional 5,000 acre-feet of water in March and April (rather than the default 20,000 AF) in CD years. If storage in McClure is still less than 200,000 acre-feet on April 1, 5,000 acre-feet becomes the requirement for that year's block flow.
2. If storage in McClure is less than 200,000 AF on April 1, irrigation deliveries for that year are 30% of demand.

2. July–October flows (not including October pulse flow)

1. July–October required flow in Wet and AN years is 200 cfs at Shaffer Bridge.
2. July–October required flow in BN years is 175 cfs at Shaffer Bridge.
3. July–October required flow in Dry and CD years is 150 cfs at Shaffer Bridge.

3. October pulse flows

1. October pulse flow releases of 12,500 AF for upstream salmon migration take place in all years. The timing of this pulse flow release may be modified by an implementation committee.¹⁴

4. November–January flows

1. November–January required flow in Wet, AN, and BN years is 220 cfs at Shaffer Bridge.
2. November–January required flow in Dry and CD years is 180 cfs at Shaffer Bridge.

¹³ See Conservations Groups' Recommendation IV, *infra*: Merced River Ecological Resource Group.

¹⁴ The model run for this flow proposal assumes that this pulse takes place in the second half of October.

5. Off-ramps and exceptions (applicable at any time but most likely to appear in CD year sequences)

1. When storage in Lake McClure is less than 130,000 AF, instream flow requirement at Shaffer Bridge drops to 100 cfs in all months until 130,000 AF in storage at McClure is re-established.
2. When storage in Lake McClure is less than 130,000 AF, Licensee shall cease all irrigation diversions.

6. Cowell Diversions

1. Required flow releases at Crocker-Huffman for Cowell diversions are in addition to all flow requirements.
2. This flow proposal assumes all Cowell diversions are the same as current conditions (we believe this to be 100% in all years).

7. Wildlife refuge deliveries

1. Required deliveries to the Merced Wildlife Refuge Licensee are 15,000 AF per year in all years.

8. Water-year types

1. Water-year types are the Merced 60-20-20 index as proposed by Merced ID in amended Final FLA, except that Licensee will determine water-year type for all months February-May based on 75% exceedence forecasts.

9. Real-time application of percent of unimpaired

1. Licensee will release of the percent of unimpaired as applicable with no five day running average being less than 50% of unimpaired, and no fourteen day running average being less than 60% of unimpaired.

D. Modeling Notes

Conservation Groups modeled the flow proposal above as closely as we reasonably could with the model as it is presently configured and without modification of the input categories except for the lookup described above. We present the results of this model run in Appendix I.

1. Water-year types and their application

- a. Since the model as currently configured does not allow us to change the exceedence percentage in any given month, we used the District's water-year types to model Conservation Groups' flow proposal.

- b. In the Conservation Groups' flow proposal, February flow requirements would begin on February 10 with issuance of the February Bulletin 120 (flows from January would continue until February 10). Each subsequent month would evaluate on the 10th of the month based on Bulletin 120 and change on the 10th; the final year type determination will be based on the May 10 Bulletin 120. Since the two week increments in the model as currently configured begin on the 1st and 15th of each month, this model run assumes that the water-year type for each year initiates on February 1. Changing the model so that it made the adjustment on February 10, March 10, April 10 and May 10 would be more accurate, but would have added a level of difficulty and complexity that beyond our immediate expertise.
- c. This model run assumes perfect foresight about the final water-year type for any given year and assumes that the final water-year type is the water-year type for February through May. Making monthly adjustments would be more accurate.
- d. We hope to be able to work with Licensee and Licensee's consultant to refine this and future model runs based on these modeling notes about water year types.

2. Averaging of flow in February through May

- a. Similar to model run DFG052512, the model run of Conservation Groups' flow proposal averages the unimpaired flow within each month in the months of February through June in any month that the percent-of-unimpaired flow requirement is applied. For each day of these months, the model applies an average value based on a percent of the monthly unimpaired flow.
- b. In Critically Dry years when a block of water would be applied instead of a percent-of-unimpaired, this model run averages the flows in March and April to account for that block of water. To meet the 20,000 AF annual block flow, this model run increases March and April daily flows from 180 cfs to 345 cfs. In this model run, it was not necessary to meet a 5,000 AF block flow, even in 1977, because the threshold condition was not met.
- c. Averaging as described here provides an understanding of the water balance on an annual basis. However, model output that incorporates this averaging does not display the daily output that would allow complete analysis of such metrics as flow variability, exceedence of thresholds for floodplain inundation, stimulation of fish migration, and flow recession for riparian recruitment.
- d. Averaging as described here also does not address how the percent-of-unimpaired would actually be applied by Project operators.

3. Application of reduced irrigation deliveries

- a. Modeling of Conservation Groups' flow proposal applies irrigation diversion limitations on an annual basis by calendar year. Generally, the irrigation season begins in March and ends in October. Water availability for irrigation deliveries in October are much more dependent on antecedent conditions from the previous water year (water years end September 30) than on October precipitation.
- b. The threshold condition for a 30% irrigation delivery restriction was not reached in any year in this model run, even in 1977.

- c. An alternative method of limiting irrigation diversions would be to set storage targets for the end of September or the end of October. Conservation Groups initially considered values for end-of-October McClure carryover storage: Wet: 350 TAF; AN: 300 TAF; BN: 250 TAF; Dry and CD: 220 TAF. The model as it currently exists does not allow a requirement for a carryover storage target; it only has a function for a 130,000 AF storage floor (similar to the 115,000 AF storage floor in the current FERC license) that requires that irrigation deliveries cease when storage drops below that level. In most years, the current model run meets the storage targets we considered. It would be instructive to evaluate determinative end-of-October storage targets; however, it appears that this would require significant modification of the model.
- d. This model run is adjusted for the priority of irrigation deliveries. Generally, the sequence is that Stevinson has first priority, then Merced ID, then Former El Nido, then Sphere of Influence. Stevinson irrigators are guaranteed 100% of deliveries in all years where McClure storage on any day before June 1 exceeds 280,000 AF; if that storage is not met, Stevinson irrigators get the same percentage of their deliveries as Merced ID customers. The only year in this run that 280,000 AF of storage is not met on June 1 is 1977, and we adjusted the 1977 deliveries accordingly. Reductions in overall irrigation deliveries have a much greater impact on Former El Nido and Sphere of Influence deliveries. Former El Nido gets one hundred percent of deliveries in years when Merced ID customers get one hundred percent of deliveries. In years where Merced ID customers do not get full deliveries, Former El Nido gets one half of the percentage of annual deliveries that Merced ID customers get. Since this model run assumes that Merced ID customers get at most 75% deliveries, Former El Nido customers would get shorted every year. Sphere of Influence customers get zero deliveries in years when Merced ID customers do not get full deliveries. Since the model run assumes that Merced ID customers get at most 75% deliveries, Sphere of Influence customers would get no water from Merced Irrigation District unless the agreement between Merced ID and Sphere of Influence customers were changed. We make no presumption on whether Merced ID might renegotiate relative allocations. The sum of water supply shortages on the Annual Summary tab in the model is not affected by the distribution of shortages.

E. Conservation Groups' Flow Proposal: Rationale

1. Hydrology and irrigation management

In the Merced River watershed, there are relatively high annual demands compared both to the average annual yield of the watershed and to project storage. Any dry-year sequence of two years or more significantly stresses the system. Particularly in drier years, the Merced watershed also often appears to have significantly less precipitation than the Tuolumne or Stanislaus watersheds to the north, with which the current 60-20-20 San Joaquin index lumps the Merced watershed. This relative dryness lies at the root of Merced Irrigation District's proposal to create a Merced-only water-year-type classification, rather than using the San Joaquin Index that was adopted in D-1641.

Merced Irrigation District's annual irrigation demand, as reported in the Water Balance Model Technical Memorandum, Attachment 2-2A Water Balance Model Validation Report, is

generally in excess of 450,000 AF per year,¹⁵ just over half the annual unimpaired inflow to Lake McClure; median annual unimpaired inflow to Lake McClure is 850,000 AF per year.¹⁶ Storage capacity in Lake McClure is 1,024,000 AF.

The hydrology and irrigation management of Merced ID in 2012-2014 provides a good example of the limitations of the system and a basis for the argument that Merced ID cannot reliably provide irrigation deliveries at the current level of demand.

2011 was a copiously wet water year, and flood releases into the lower Merced River persisted into the summer. 2012 was a Dry water year under San Joaquin Index. Merced Irrigation District planned a reduced irrigation schedule in early spring, but elected to make full irrigation deliveries after late inflows. Following large runoff events in November and December of 2012, calendar year 2013 was one of the driest on record, making water year 2013 a Critically Dry year.¹⁷ Merced ID made 75% irrigation deliveries in calendar year 2013. In 2014, there was almost no inflow until February, and Merced ID added little over 100,000 acre-feet of storage in Lake McClure. Merced ID planned as late as May to deliver 30% of full deliveries, but in early June slightly increased the amount to 36% of full deliveries.¹⁸

In April, 2014, the Merced River Hatchery released all of its fish into the lower river following a disease outbreak, due in part to high water temperatures of water released to the hatchery from Lake McClure. In April, Licensee also released, following an agreement with California Department of Fish and Wildlife, a pulse flow of 5000 AF to attempt to move surviving salmonids in the lower Merced out of the river.¹⁹ This summer, the California Department of Fish and Wildlife is asking Merced ID to work with the Department to rescue fish from the river downstream of Crocker-Huffman Dam, where water temperatures are likely to become lethal for juvenile and adult *O. mykiss*.²⁰

Part of the difficulty in managing the Merced system is simply that volume matters. The Don Pedro system on the Tuolumne River immediately to the north of the Merced has twice the average annual runoff and twice the storage of the Merced. On July 5, 2014, Don Pedro had almost four times as much water in storage as did Lake McClure: 1,000,000 AF in Don Pedro, 267,000 AF in Lake McClure. Turlock Irrigation District and Modesto Irrigation District, operators of Don Pedro, at least have the option to create some carryover storage by reducing irrigation deliveries in 2014. Merced Irrigation District does not have that option.

Implementation of Conservation Groups' flow proposal would have improved instream conditions and left more water in storage than current conditions in the Merced watershed, thus

¹⁵ Attachment 2-2A Water Balance Model Validation Report, table 5, pp. 20-21. The Amended FLA states: "In more recent years, canal diversions typically range between 400 and 500 thousand ac-ft." p. E3.3.2-54.

¹⁶ SWRCB, Technical Report, op cit, Table 2.1, page 2-3.

¹⁷ <http://cdec.water.ca.gov/cgi-progs/iudir/WSIHIST>

¹⁸ See <http://www.sacbee.com/2014/06/03/6455458/growers-to-receive-increased-water.html#storylink=cpy>

¹⁹ *Id.* The water for this pulse flow was sold at \$1000 an acre-foot, delivered through the South Delta state or federal pumps.

²⁰ DFW proposes capturing and relocating salmonids to ponds near Crocker-Huffman Dam, presumably at the Merced River Fish Hatchery or the adjacent private Calaveras Hatchery, and equipping the ponds with chillers. See eLibrary no. 20140611-5038.

reducing the crisis level impacts to both aquatic resources and to irrigation deliveries in the Merced watershed in 2014. This would have come by reducing water available for irrigation in good years, more proactively reducing irrigation deliveries in the first Dry year, and more aggressively reducing irrigation deliveries in Critically Dry years.

In the long term, Merced ID will need to reduce its irrigation demand to restore balance to the Merced River system. This is roughly consistent with the overall California policy initiative to reduce statewide water use by 20% by the year 2020, although this reduction to date has been mandated only for municipal and industrial uses. Promising to meet full demand in good water years reduces carryover storage to guard against dry-year inflow that can turn the watershed to scarcity in one year. This existing paradigm fails to manage expectations and creates permanent pressure for over-delivery.²¹ It replaces long-term management with an annual scrum for water subject to local, state, and federal politics, and increases pressure on a groundwater basin that is notoriously in decline.²²

2. Findings of the State Water Board on San Joaquin and Merced River hydrology

In its Technical Report, the State Board makes the following findings about the hydrology of the San Joaquin watershed, including specific findings about the Merced River.

2.6 Conclusions

In conclusion alterations to the unimpaired flow regime include reduced annual discharge, reduction in frequency and intensity of late fall and winter storm flows, reduced spring and early summer snowmelt flows, and a general decline in hydrologic variability. The following is a list of the findings:

²¹See conclusion of January 31, 2011 letter of Merced ID's Bryan Kelly to FERC: "The fact that significant water supply impacts occur with the smallest change in minimum flow requirements demonstrates that there is very limited water available to increase Merced River flow that does not come at the expense of irrigation water supplies." (p. 19). A different way of stating the issue is that Merced ID has over-allocated water to irrigation customers at a rate that is not sustainable. See eLibrary no. 20110131-5313.

²² See for instance *USGS: Merced County land sinking due to overpumped ground water*, Modesto Bee November 21, 2013 <http://www.modbee.com/2013/11/21/3046038/usgs-over-pumping-of-valley-ground.html#storylink=cpy>:

Over pumping of San Joaquin Valley aquifers has caused subsidence for decades. But USGS researchers report the current rate of decline is among the highest ever measured, and they discovered the problem's epicenter has shifted north to Merced County.

Comparing images and data from 2008 with 2010, they measured the subsidence and discovered the bowl of depression is much larger than originally believed. The worst area near El Nido is falling at a rate of nearly one foot per year.

A copy of the study is posted at <http://pubs.usgs.gov/sir/2013/5142/>

The Commission should, in its NEPA analysis, document the existing condition of over-use of the Merced groundwater basin. Any future worsening of the Merced groundwater basin cannot simply be attributed to any increased instream flow that may be required by the Commission or the State Water Board.

A) Annual flow volumes at Vernalis have been reduced to a median of 46% of unimpaired flow, while the February through June flow volume has been reduced to a median of 27% of unimpaired flow. In terms of median values, the greatest reduction of the monthly flows occurs during peak spring snowmelt months of April, May, and June. Observed flows during these months are a median of 25%, 17%, and 18% of unimpaired flow, respectively.

B) Observed flows from February through June as percentages of unimpaired flows have fallen well below medians of 41%, 21%, and 26% in the Stanislaus, Tuolumne, and Merced Rivers respectively, with the April, May and June values generally far lower, especially May and June flows on the Tuolumne and Merced Rivers. For April, May and June, the medians are 32%, 26% and 40% of unimpaired flow for the Stanislaus River, 22%, 12% and 9% of unimpaired flow for the Tuolumne River, and 25%, 18% and 15% of unimpaired flow on the Merced River. This included values as low as 1% and 2% of unimpaired flow in the Merced and Tuolumne Rivers respectively in June 1991.

C) Flow conditions are more static with less seasonally variable flows throughout the year. The springtime magnitude is now severely dampened and there is more flow in the fall than would occur under an unimpaired condition. The wettest month of the year is now less predictable and is distributed over more months from year to year.

D) Short term peak or storm flows that occur several times within a given year, generally between November and March, are dramatically reduced under the present management conditions.

E) Tributary contributions are altered leading to a greater percentage of flow being delivered by the Stanislaus River, and much lower percentage of flow being delivered by the upper San Joaquin River.²³

3. Biological rationale for prioritization of months in Below Normal and Dry water years

In considering the relative benefit and losses of eliminating certain months from the default February through June percent-of-unimpaired requirement in Below Normal and Dry years, Conservation Groups principally considered 1) the lifestages of salmon and *O. mykiss* that benefit from flow in each month; 2) the relative biological benefit that derives from the hydrology under the percent-of-unimpaired requirement in each month; and 3) and downstream conditions in each month.

Licensee's 2012 Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River, published as a study report required by the State Water Board in November 2012 based on data collected from January 1 through June 15, 2012, provides an example of the timing and size of salmon out-migrants in a Dry water year. Two rotary screw traps were installed in the lower Merced River at Hopeton (RM 37.5) and at Stevinson (RM. 4.8). Few fry were captured in the screw traps, presumably because of difficulty of capture. In mid to late February,

²³ State Water Resources Control Board, Technical Report, op cit. pp. 2-56 and 2-57.

parr became the most frequently captured life stage at the upper Hopeton trap (RM 37.5); 13,145 parr captured at the Hopeton trap over the season, but only 55 were captured at the lower Stevinson trap (.004 ratio of lower to upper traps). By mid-April smolts were virtually the only life stage captured. In Julian Week (JW) 19, a large number of salmon smolts were released from the Merced River hatchery at the peak of a 1000-1200 cfs pulse flow, and during the several day flow reduction coming off the peak of the pulse; 14,985 of these were captured at Hopeton, and 1,297 were captured at Stevinson (.087 ratio of lower to upper traps). Excluding this hatchery release, 10,180 smolts were captured at Hopeton, and 576 were captured at Stevinson (.056 ratio of lower to upper traps).²⁴

There is some confounding evidence in the data, including more hours fished at the upper trap and a stream channel issue at the lower trap. The authors note that the traps appear to be more efficient in catching larger juveniles. Nonetheless, on a coarse basis the data suggests that the pulse flow improved survival from the upper to lower trap, and that the larger smolts were more successful migrating downstream than earlier life stages. The peak of outmigration of non-hatchery smolts appears to have been in JW 15, or mid-April; parr peaked in JW's 9-12 (roughly, throughout March).

It is also worth noting that a high turbidity event apparently caused by a combination of instream mechanical work upstream of Hopeton and a small rain event led to a downstream migration and capture at the Hopeton trap of 319 *O. mykiss* "smolts." This suggests that under some flow circumstances *O. mykiss* in the Merced River may be stimulated towards an anadromous life history strategy.

Licensee's 2013 Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River, published in November 2013, showed many of the same trends in a Critically Dry water year, with outmigration tending to be slightly earlier than in 2012. Parr became the predominant life stage captured in JW 9 (end of February); smolts became predominant in JW 14, about the first of April. The data presentation in the 2013 Report is not broken down by numbers of each life stage for each week (as presented in the 2012 Report); however, by cross referencing Tables 5.2 (catch at Hopeton), 5.3 (catch at Stevinson), and 5.4 (life stage by percent of catch), patterns similar to 2012 emerge. A total of 37,160 fish were captured at Hopeton; only 734 were captured at Stevinson, a dismal .02 of the fish captured at Hopeton. The largest outmigration was during a storm in mid-April.²⁵ Poor trap efficiency caused the District's consultants to opine:

... trapping results from Stevinson were generally low and thus, most likely do not represent magnitude and timing of fry and juvenile Chinook Salmon emigration. Additionally, the data collected at both sites is not suitable to estimate juvenile salmon survival or how predatory fish may affect survival rates.²⁶

²⁴ Merced ID, Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River, 2012, Figure 5.3, p. 10; see also p. 9 for description of hatchery release and other detail.

²⁵ Merced ID, Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River, 2013, Figures 5.2, 5.3, and 5.4, pp. 11-13.

²⁶ *Ibid*, p. 21. Figure 6.1 on the same page shows that flow in the Merced River from January through June, except during the one April storm event, was less than 400 cfs throughout the period, and generally at about 300 cfs or less. This creates poor conditions for screw trap operation at the lower end of the river due to lack of velocity. It also

More and better monitoring of fish movement is needed on the Merced River. But the timing of life stages and outmigration reported in 2012 and 2013, supported in graphs from screw-trap data from 1999-2009 in Appendix A of the 2012 Report, suggests that March and April are good months to emphasize in Dry-year flow management.²⁷

In considering flows in Below Normal years, Conservation Groups observed that most salmon outmigration is done by the end of May. While high June flows may have benefit to pelagic fish species downstream in the Delta, and in Wet years may extend the in-river rearing period and increase outmigrant size, in Below Normal years most salmonids are likely to be out of the Merced River by the end of May. Water temperature modeling suggests that water temperature objectives for the lower Merced River are difficult to meet in May in drier water years, let alone in June.²⁸ On the front end of the February – June time period, February generally has relatively little inflow compared to later months, including June; reducing flow in that time period would gain little in volume but would lose an entire month in variability. Eliminating the percent-of-unimpaired requirement in June also does more to balance the water towards water for storage and irrigation. With less in-river biological benefit in drier water years and relatively high water cost, Conservation Groups chose to first eliminate June as a month required to release a percent-of-unimpaired inflow in Below Normal years, with February also being eliminated in Below Normal years immediately preceded by two Dry or Critically Dry years.

4. Selection of 60% as the applied percentage of unimpaired flow requirement

The State Board's 2010 Delta Flow Criteria Report²⁹ established that 60% of February-June unimpaired flow is what fish need as in-river flow in each of the three major San Joaquin tributaries and as outflow from the San Joaquin River. The Delta Flow Criteria Report used fall-run Chinook as the target species for evaluation within the tributaries, including the Merced. The Report evaluated the effects of flow on a variety of species including Delta smelt when considering fisheries downstream of Vernalis on the lower San Joaquin River.³⁰

On balance, Conservation Groups believe it is of greater value to meet the flow requirements for fish in as many months as possible. In Wet and Above Normal years, this is achievable in all months (February – June) with a 25% reduction in irrigation deliveries. In

creates extremely poor conditions for juvenile survival. These flows, however, are greater than the minimum flows proposed by Merced ID in Appendix E2 of its Amended Final License Application; *see* Table 1, p. App E2-9.

²⁷ Using Bulletin 120, this would move the actual dates back ten days, from March 10 – May 10.

²⁸ See e.g. Technical Memo 2-5, Reservoir Water Temperature Management and Feasibility, Figure 3.2.2-3, p. 14, and Figure 3.2.4-3, p. 21. This technical memo is difficult to glean useful information from, because the first figure models water temperatures in Dry/CD years without any spring pulse flow, and the second figure models water temperatures under a 40% of unimpaired requirement with no adjustment for Critically Dry years or dry-year sequences. Nonetheless, since Conservation Groups do not have independent water temperature modeling capability, we must use available information to evaluate general trends in water temperatures under different flow scenarios.

²⁹ http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf

³⁰ See analysis by the Bay Institute for a variety of species including bay shrimp, striped bass, starry flounder, and longfin smelt, as well as Delta smelt in TBI Exhibit 2 at

http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/bay_inst.shtml

water years where the water balance did not allow 60% of unimpaired release in all months, Conservation Groups elected to meet it in a reduced number of months rather than spread the water cost over five months by reducing the percent of unimpaired. The principal benefits of increased February – June flow ascribed to salmonids in the Delta Flow Criteria Report are variability, floodplain inundation above certain flow thresholds, water temperature improvements, outmigration success from the San Joaquin tributaries, and outmigration success from the lower San Joaquin River. The Delta Flow Criteria Report establishes a February – June flow of 5000 cfs as a threshold flow above which salmon outmigration success is substantially better than at lower flows.³¹ The State Board’s analysis showed that 60% of unimpaired from each of the three major San Joaquin tributaries would achieve an average February – June flow of 5000 cfs in 85% of years.³² The functional benefits seem to be greater above a threshold than by lowering the threshold.

5. Blocks of water in Critically Dry years

In Critically Dry years, including multiple Dry/Critically Dry-year sequences (which Conservation Groups propose to treat as Critically Dry years), taking a percent-of-unimpaired flow in the February – June time period causes the system to run out of water. Even with proposed 50% irrigation deliveries, storage is reduced, and subsequent Dry or Critically Dry years leave Lake McClure at a dangerously low level such as that experienced in early 2014. Merced ID and other water purveyors in the San Joaquin River and elsewhere have argued that using a percent-of-unimpaired flow in any year is infeasible because of water shortage and depleted storage (with attendant water temperature impacts) in Critically Dry years and in dry-year sequences.³³

Reduction of baseline diversions to restore balance to the Merced River’s beneficial uses, combined with reasonable off-ramps for flow requirements in Critically Dry years (including dry-year sequences), cuts through this tedious hyperbole. In Critically Dry years, Conservation Groups propose that a 20,000 AF block of water be added to the 180 cfs base flow, and that the deployment of this block of water be determined by an implementation committee, such as that proposed by Licensee in Proposed Measure T&E3 (“Establish Merced River Anadromous Fish Committee”).³⁴ In exceptional years, when storage in Lake McClure is less than 200,000 AF on April 1, the block of water would be reduced to 5,000 AF, (similar to conditions encountered and pulse flow agreed to by DFW and Merced ID in 2014). Under Critically Dry water-year conditions, water is not available to substantially enhance the rearing conditions of juvenile salmonids over most of the February - June period; we make no pretense that 20,000 AF will do that. The proposed block flow is purely and simply triage to at least facilitate successful outmigration of those salmonids that are able to survive low flow conditions; the existing 180 cfs baseflows (pursuant to the current Davis-Grunsky requirement) provide adequate spawning conditions, but create little juvenile rearing habitat.

³¹ Delta Flow Criteria Report, p. 120. The figure is derived in part from analysis done by the Bay Institute as cited above and by Cain et al, *San Joaquin Basin Ecological Flow Analysis* (2003), available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/cain_etal_2003.pdf.

³² Delta Flow Criteria Report, p. 121.

³³ See for example January 31, 2011 letter of Bryan Kelly to FERC, op cit, (eLibrary no. 20110131-5313), Table 6.

³⁴ See Amended FLA, p. App E2-19, and Conservation Groups’ Recommendation IV, *infra*.

F. Comments on Proposed Measure AQR1, Pt.1: Licensee’s Proposed Minimum Streamflows

The State Water Board, as quoted above, has found the average 26% of February – June unimpaired flow that is passed by Merced Irrigation District into the lower Merced River to be grossly deficient. Relative to the low escapement on the Tuolumne and Stanislaus rivers, Merced River escapement of fall-run Chinook salmon is even lower.

Licensee proposes to reduce existing flows as compared to baseline in November through March: Davis-Grunsky flows currently require 180 cfs in “Dry” years (roughly, Dry and Critically Dry years as proposed by Merced ID) and 220 cfs in the remaining “Normal” years; only in Wet water years would Licensee’s proposed “target” flow be as great as the current numeric requirement.³⁵ Until 2010, the Vernalis Adaptive Management Program also provided, in April and May, a large pulse flow of one month’s duration, between 2000 and 7000 cfs as measured at Vernalis on the lower San Joaquin River; a substantial portion of this pulse was provided by water released from the Merced River Project.³⁶ Licensee proposes no such spring pulse. Licensee’s flow proposal would further reduce flows in all years by operating closer to the minimum requirement by having a target flow and a hard minimum at the flow compliance point at Shaffer Bridge, thus eliminating much of the buffer flow that previously went to the river.

Effectively, Licensee proposes to make two kinds of water years: very wet water years, where flood releases dominate the hydrograph for many months (as was the case historically in 1995, 1998 and 2011), and functionally critically dry water years (which would effectively be all the rest of the years, the vast majority). In these functionally critically dry water years, there would be no geomorphic flows, no floodplain inundation, no flow variability, and no spring pulses to encourage and aid in outmigration. There would be no natural flow recession at the end of the peak of the natural hydrograph that would aid in cottonwood recruitment. In April and May, the lower Merced River – San Joaquin River migration corridor downstream of Highway 59 would effectively become a warm water lake, perfect habitat for bass and other piscivorous fish that Merced ID and its associates in the San Joaquin Tributaries Association have highlighted as a major reason for lack of survivorship by juvenile salmon. In over half of water years, summer habitat for juvenile *O. mykiss* would almost entirely dependent on flows provided for the Cowell diversions, and there would be effectively no summer flow from the Merced River that reached Vernalis on the lower San Joaquin River.

In the Amended FLA, Licensee justifies its flow proposal with hundreds of pages of charts and graphs displaying various aspects of physical habitat according to its PHABSIM modeling. At best, it treats the lower Merced River like a mountain trout stream unconnected to the Bay-Delta estuary; in terms of function, it treats the Merced River much more like a canal than a living river.

³⁵ See Amended FLA, Appendix E2, p. E2-8.

³⁶ Pulse flows were negotiated in some years after VAMP expired.

There are many problems with the Amended FLA's presentation of the PHABSIM modeling results, not least of which is complete lack of clarity about what baselines are referred to where and what numbers and values are being compared to what. But that misses the point. Physical habitat as modeled by PHABSIM (depth, velocity, sometimes cover and substrate) cannot substitute for the requirements of a dynamic hydrograph that is needed by every river. The State Water Board has determined that replicating this dynamic hydrograph is the single most important key to improving fisheries in the Merced River and other San Joaquin tributaries, in the lower San Joaquin River, and in the Bay-Delta estuary as a whole. In terms of summer flows, summer rearing habitat for juvenile and adult *O. mykiss* in the Merced River is almost completely dependent on water temperature. The PHABSIM study is of marginal utility in verifying basic flow needs for Chinook spawning and for establishing a flow floor for juvenile rearing of salmonids in the February – June time period. The PHABSIM study also had the benefit of confirming that mechanically modified floodplain habitat in Reach 2 of the lower Merced River has potential benefits to fish if that habitat is inundated with water (absent which it is simply modified terrestrial habitat). As for the rest of the PHABSIM-based information presented in the Amended FLA, 90% or more is a graphic design exercise in redundant irrelevance.

The bottom line is that lower Merced River needs about twice the amount of water that it has seen since the Merced River Project has been in place. Licensee proposes to back up and reduce flow. It is not a serious proposal.

G. Consultation

Licensee presented its flow proposal to relicensing participants on April 25, 2013. Licensee and relicensing participants discussed general approaches to flow in various meetings in 2012 and 2013. Licensee modeled several flow proposals put forward by relicensing participants, notably NMFS and DFW; we have referred to two of them in discussion above. Licensee's consultant also was very cooperative and helpful in providing advice and assistance in use of the water balance model.

In general, Merced ID declined to consider any flow proposal that would require release to the lower Merced River of a percent of February – June unimpaired inflow to Lake McClure.

H. Costs of Conservation Groups' Flow Proposal

It would be extremely difficult to put a cost on the Conservation Groups' flow proposal. Modeling output will allow some coarse evaluation of generation impacts. Otherwise, a significant part of the difficulty in determining costs would involve defining which costs are included, for whom, and against what baseline for comparison. If, for example, the State of California requires, in the next five years, 20% reduction in agricultural water use (as it mandated in 2009 for urban users by the year 2020), would it then be appropriate to consider the entire costs of reduced irrigation diversions the outcome of new flow requirements for the Merced River Project? If Merced ID increases the price of water to make up for the loss of water available for sale, would this then be a "cost?"

The DEIS will need to make an effort to determine the costs of Conservation Groups' flow proposal, and determine the basis for its analysis. Conservation Groups will comment on the Commission's evaluation.

II. The Conservation Groups' Recommendation: Anadromous and Resident Fish Passage

A. Recommended Measure

1. Licensee shall establish a Merced River Fish Passage Technical Working Group composed of resource agencies and other interested stakeholders within one year of license issuance. At minimum, these resource agencies shall be invited to join the Technical Working Group: NMFS, the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the State Water Resources Control Board, the Bureau of Land Management, the U.S. Forest Service, and the National Park Service.
2. Licensee shall develop, in consultation with the Technical Working Group, short-term and long-term actions for fish passage at Crocker-Huffman Dam.
 - a. Within three years of license issuance, Licensee shall open the Crocker-Huffman fish ladder on a temporary basis for seasonal use by *O. mykiss* when fall-run Chinook are not present.
 - b. Within three years of license issuance, Licensee shall develop and implement monitoring and reporting protocols to quantify passage of fish at Crocker-Huffman Dam.
 - c. Within five years of license issuance, Licensee shall develop and implement a plan for long-term fish passage infrastructure for upstream and downstream passage of *O. mykiss* at Crocker-Huffman Dam.
 - d. Within five years of license issuance, Licensee shall evaluate engineering alternatives for reducing or preventing entrainment of *O. mykiss* into the Merced Main Canal.
 - e. Within seven years of license issuance, Licensee shall implement entrainment reduction or prevention measures at the Merced Main Canal based on evaluation by the Technical Working Group.
3. Licensee shall evaluate, in consultation with the Technical Working Group, the suitability of habitat in the upper Merced River for purposes of reintroducing spring-run Chinook salmon and/or steelhead.
 - a. Within eighteen months of license issuance, Licensee shall assemble and summarize existing information regarding suitability of habitat in the upper Merced River to support reintroduction of spring-run Chinook salmon and/or steelhead, including field data collected by NMFS and Conservation Groups. This summary shall include discussion of thermal suitability, barriers, holding habitat, spawning and incubation habitat, and rearing habitat.
 - b. Within two years of license issuance, Licensee shall develop a scope of work to complete gathering of information needed to determine the suitability of habitat in

- the upper Merced River to support reintroduction of spring-run Chinook salmon and/or steelhead.
- c. Within three years of license issuance, Licensee shall complete a draft report on the suitability of habitat in the upper Merced River to support reintroduction of spring-run Chinook salmon and/or steelhead and present it to the technical working group for a three month review.
 - d. Based on the response of the technical working group, Licensee shall, within three and a half years of license issuance, complete a final report on the suitability of habitat in the upper Merced River to support reintroduction of spring-run Chinook salmon and/or steelhead and file it with FERC.
4. For target species determined to have suitable habitat in the upper Merced River in the habitat feasibility evaluation, Licensee shall conduct an engineering study to determine capture and transport options for moving adults of such species from downstream of Crocker-Huffman Dam to the Merced River upstream of Lake McClure, and juveniles of such species from upstream of Lake McClure to downstream of Crocker-Huffman Dam.
 - a. Licensee shall develop a scope of work for the engineering study within six months of completion of the feasibility study, in consultation with the technical working group.
 - b. Licensee shall complete a draft engineering study within one year of the completion of the feasibility study, and present the draft to the working group for a three month review.
 - c. Based on the response of the technical working group, Licensee shall, within one and a half years of completion of the feasibility study, complete a final engineering report and file it with FERC.
 5. Based on the results of the habitat feasibility, Licensee shall, within eight years of license issuance, develop a plan for the reintroduction to the upper Merced River of those species for which the upper Merced River habitat is determined to be suitable. Licensee shall develop this plan in consultation with the Technical Working Group. The plan shall include:
 - a. A project description;
 - b. Location, specifications and conceptual drawings of all necessary facilities;
 - c. Costs, known funding sources, and potential funding sources;
 - d. Permitting and environmental review requirements;
 - e. History of consultation;
 - f. A timeline for implementation.

B. Rationale

1. Background

The National Marine Fisheries Service, the federal trustee for anadromous fisheries, has developed a comprehensive Final Central Valley Recovery Plan which defines actions for recovery of two federally listed species: the Distinct Population Segment (DPS) of Central

Valley steelhead and the Evolutionarily Significant Unit (ESU) of spring-run Chinook salmon in the Merced River.³⁷ The release of this document is calendared for July 22, 2014, the day these comments and recommendations of Conservation Groups are being filed. As we understand it, the actions of the plan include:

- Protect and enhance Central Valley steelhead DPS and their critical habitat from the lower Merced River below Crocker-Huffman Dam.
- Expand the extant population of the Central Valley steelhead into formerly occupied habitats by establishing new viable populations upstream of the current limit of anadromy at Crocker-Huffman Dam, and into the upper Merced River watershed, upstream of the Project's New Exchequer Dam.
- Reintroduce Central Valley spring-run Chinook salmon ESU into the Merced River, upstream of the current limit of potential anadromy, and into the upper Merced River watershed upstream of the Project's New Exchequer Dam after 2025 (unless spring-run Chinook salmon re-populate the lower Merced River below Crocker-Huffman Dam prior to 2025).

In order to meet the goals and objectives of the Recovery Plan for Central Valley steelhead and spring-run Chinook salmon, as well as to provide a comprehensive and beneficial improvement for these threatened species, NMFS is recommending within the Merced River Project relicensing a Fish Passage Program. Although Conservation Groups have not had an opportunity to review NMFS' Preliminary §18 prescriptions for the Merced River Project, it is our understanding that NMFS is requesting that the Commission incorporate into Merced ID's new project license a requirement to open and eventually replace the fish ladder at Crocker-Huffman Dam. It is also our understanding that NMFS will reserve its authority to prescribe a requirement to pass fish into the upper Merced River, upstream of Lake McClure.

Generally speaking, Conservation Groups support NMFS's recommendations and reservation of authority. Conservation Groups offer our independently developed fish passage recommendations in support of the objectives that we believe NMFS seeks to achieve.

2. Fish Passage at Crocker-Huffman Dam

Water temperature modeling performed by both the Licensee and by the California Department of Fish and Wildlife during the course of the relicensing has demonstrated that limited cold water habitat is reliably available in the lower Merced River in the summer.³⁸ Downstream of Crocker-Huffman Dam (RM 52), cold water is reliably available in summer downstream only to about Snelling (RM 46.5), both under current operations and with the flow requirements proposed by Conservation Groups. It was the analysis of Conservation Groups that substantial additional summer flow releases would be needed to increase the number of stream

³⁷ National Marine Fisheries Services. 2014. Final Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead. NMFS, West Coast Region, Sacramento, California. Scheduled for release on July 22, 2014.

³⁸ See e.g. Technical Memo 2-5, Reservoir Water Temperature Management and Feasibility. Our conclusions, however, are additionally based on multiple discussions and review of water temperature modeling output with Licensee and resource agencies.

miles of reliable cold water habitat, under the EPA 18°C criterion for *O. mykiss* holding and rearing or even under a 20°C criterion. For reasons documented in our discussion of our flow proposal above, Conservation Groups determined (consistent with the State Water Board) that February – June flows were a better use of available water to enhance habitat for salmon and *O. mykiss* than substantially augmented summer flows to benefit *O. mykiss*.

About two miles of riverine habitat is present in the Merced River between Merced Falls Dam and Crocker-Huffman Dam. This reach is used to convey large volumes of irrigation water during the irrigation season, so that during the hot times of year water in this reach is reliably cold. The reach consistently holds large *O. mykiss*, and at times features large hatches of aquatic insects.³⁹ Given the lower Merced River's limited amount of reliable cold water habitat available both to support resident rainbow trout and to assist in the recovery of Central Valley steelhead, Conservation Groups believe that restoring connectivity for *O. mykiss* from downstream of Crocker-Huffman to the Merced Falls reach is a critical need.

The Merced Falls reach is not only additional habitat; during hot weather, it is the coldest habitat downstream of the Project. It has been reported to us that during the current drought conditions in 2014, remaining *O. mykiss* downstream of Crocker-Huffman have been bunched up just below the dam. While it is likely that thermal conditions in 2014 in the lower Merced River may become lethal for many *O. mykiss* by the end of the summer, the duration of exposure is a known factor in mortality. Based on the record and on local knowledge, Conservation Groups believe that an operational fish ladder at Crocker-Huffman today would likely be used not only to access upstream spawning habitat, but also to gain thermal refuge or simply to access better thermal conditions in the summer. Under this year's conditions, we are convinced that an operational fish ladder, if it were in place today, would not only be used, but might also provide thermal refuge sufficient to allow the survival of a greater fraction of *O. mykiss* in the lower Merced River.

Personnel from the California Department of Fish and Wildlife have informally expressed concerns to us about the passage of fall-run Chinook salmon past Crocker-Huffman Dam. We believe that these concerns can be addressed in the long term. In the short term, we are proposing to restore upstream passage at Crocker-Huffman Dam at times when fall-run Chinook are not present.

Conservation Groups recognize Licensee's concerns about the potential expense of a fish screen on the intake to the Main Canal, just upstream of Crocker-Huffman Dam. Conservation Groups propose a step-wise approach to determining the relative importance of such infrastructure and how it might be configured if it is needed. However, the present preclusion of the benefits of habitat upstream of the dam is not warranted by the potential expense of screening the diversion works. Conservation Groups commit to working with the District in seeking funding for a facility that would prevent entrainment into the Main Canal.

Conservation Groups also wish to emphasize that we are convinced of the benefits of fish passage at Crocker-Huffman Dam on a stand-alone basis. Our recommendation to restore

³⁹ Conservation Group advocates Michael Martin and Cindy Charles have separately reported excellent fishing experiences in this reach.

passage at Crocker-Huffman is not a gambit to create a regulatory hook for passage past the entire Project. While we believe that an examination of passage (capture and transport) from downstream of Crocker-Huffman to upstream of Lake McClure is appropriate in its own right, this is a separate issue from a ladder at Crocker-Huffman Dam.

3. Capture and Transport from Downstream of Crocker-Huffman Dam to Upstream of Lake McClure and from Upstream of Lake McClure to Downstream of Crocker-Huffman Dam

Merced ID did not propose a measure regarding anadromous or resident fish passage in its Amended FLA. Moreover, in relicensing, the Commission did not order study of habitat upstream of the Project or study of means to pass fish past the developments from Crocker-Huffman Diversion to the head of Lake McClure. The National Marine Fisheries Service and the Merced River Conservation Committee performed some reconnaissance related to upper river habitat, included placing and retrieving thermal loggers and visiting known or suspected fish-passage barriers in the upper watershed. However, additional information needs to be collected and analysis needs to be performed in order to determine whether suitable habitat for steelhead, spring-run Chinook, or both species is reliably present in the upper Merced River. Additional information also needs to be collected and analyzed to determine how a collection and transport program might effectively be constructed, how it would operate, and how much construction and operation would cost.

C. Consultation

Licensee initiated no consultation on fish passage as part of the relicensing.

D. Costs of Measure

The cost alternatives for providing fish passage at the Crocker-Huffman Dam range from \$20,000 (re-opening existing fish ladder) to \$3,500,000 (building a completely new fish ladder facility).⁴⁰

The cost of a capture and transport program is unknown, and could vary widely depending on target species, nature and location of facilities, and numerous other factors. Part of the recommended measure is to determine the cost of a capture and transport program, together with defining the elements of such a potential action.

III. Conservation Groups' Recommendation: Native Salmonid Conservation Management Program

A. Recommended Measure

(a) Merced ID shall develop and implement provisions of a Merced River Fish Management Plan (MRFMP) to design, construct and operate a fish propagation facility for the

⁴⁰ See NMFS, Merced River Fish Passage Feasibility Study, eLibrary no. 20140106-5047, p. 113.

production of native salmonids. The fish produced at this facility shall be used to supplement the upper Merced River and its tributaries, Lake McClure, and McSwain Reservoir. Subject to the approval of NMFS, USFWS, and CDFW, it may also be used to supplement the Merced River downstream of Merced Falls Dam and Crocker-Huffman Dam. Merced ID shall release propagated native salmonids to supplement existing populations, or to introduce native salmonids of resident and/or migratory life histories into reaches where they are not currently present. Target release sites will include those reaches where non-native trout or Chinook salmon have been actively introduced or where high quality but underutilized habitat is available.

Supplementation of native salmonids is expected to complement nonnative trout suppression and/or stream habitat improvement activities. Merced ID shall be responsible for the appropriate marking of all outplanted fish for the purpose of identifying these fish during future monitoring efforts.

(b) The initial capacity of the facility will be up to a five year running average of 60,000 eyed eggs, fry, or fingerling (three to four inch) Chinook salmon per year and multiple age class broodstock (capacity of 1,000-2000 pounds). The initial capacity of the facility will be up to a five year running average target number of 667,200 rainbow trout annual production, commensurate with the need to outplant fish in tributaries of the Merced River.

(c) Merced ID will design the facility to simultaneously propagate two species of fish and several year classes (life stages); selection of species, stocks and life stages to be produced shall be determined in consultation with, and subject to approval by, the Merced River Ecological Resource Group (MRERG).⁴¹ In addition, Merced ID will ensure that the facility has the capacity to sustain the necessary numbers of broodstock fish to produce the number of eggs, fry or fingerlings for the purposes of the Conservation Program.

(d) Merced ID shall use a multi-step approach to implement this measure. Merced ID shall complete each step in consultation with and subject to approval by the MRERG. Preliminary reconnaissance suggests that a 22 acre Merced ID parcel located immediately below the New Exchequer Dam is a potential location for the propagation facility.

i) The first step for Merced ID in the development of the native salmonid conservation facility shall be to confirm the feasibility of the New Exchequer hatchery site. If this site proves to be infeasible, Merced ID will consider alternatives including purchase or funding of an alternate existing facility, or development at a new site with an appropriate source of water. If a feasible site cannot be identified, Merced ID will re-direct mitigation efforts towards the purchase of suitable eggs, fry or fingerlings from another source to meet population goals or toward commensurate protection, mitigation, and enhancement (PM&E) measures as determined in consultation with and subject to approval by the MRERG.

(ii) The second step shall be to complete implementation planning that addresses the following:

⁴¹ See Conservations Groups' Recommendation IV, *infra*: Merced River Ecological Resource Group.

1. Goals and policies of federal and state agencies regarding conservation facilities and native salmonid recovery
2. Risks and benefits of supplementing both species in the Project area
3. Mitigation measures to be used to reduce risk (e.g., of spreading disease, domestication, etc.)
4. A conceptual level description and engineering design for the facility, with specifications
5. Description of any off-site facilities or techniques that could be used as part of release strategies (e.g., acclimation and volitional release ponds, streamside or instream incubation of eyed eggs, etc.)
6. Sources and techniques to be used for identifying and collecting brood stock
7. Target production levels by life stage
8. A hatchery genetics management plan

(iii) The third step shall be preparation of draft and final engineering plans for the facility, completing any required regulatory review (e.g., NEPA compliance) and obtaining any needed permits. Following approval of final design and permitting, Merced ID will construct the facility and fund operation and maintenance for the license term.

(e) Merced ID shall complete implementation planning within three years of license issuance, and the facility will be operational within six years of license issuance.

(f) Merced ID shall prepare a construction compliance report within one year following construction of the facility. This report will document any variances in implementation planning, engineering and construction.

(g) Prior to initial operation of the fish conservation facility, Licensee shall prepare and present to the MRERG an annual summary of its fish conservation activities. Once the facility is operational, Merced ID shall prepare and present to the MRERG an annual summary that includes the following information:

- (i) numbers, life stages, size and species of fish produced;
- (ii) timing and locations of releases;
- (iii) percent survival between life stages;
- (iv) results of effectiveness monitoring;
- (v) disease outbreaks, other problems and remedies that were implemented to reduce the risk of problems reoccurring;
- (vi) effectiveness monitoring in (j).

(h) Every five years, Licensee shall prepare and file with FERC a status report that summarizes the annual reports and provide more detailed analysis and assessment of trends in the data. The five-year status reports will also describe any changes in production or release strategies developed in consultation with and the state and federal fisheries agencies, and the rationale for implementing the changes.

(i) Licensee, in consultation with and subject to approval by the MRERG, shall establish population goals for the Conservation Program by determining appropriate tributary target fish

populations desirable for the purpose of establishing self-sustaining, native stocks of fish. Optimal outplanting strategies for achieving population goals will be identified by Merced ID in consultation with and subject to approval by MRERG, and through monitoring and evaluating multiple outplanting strategies that consider appropriate fish sizes, outplanting densities, frequency and timing. Each outplanting strategy will have independent markers/identifiers for analysis (e.g., otolith marks utilizing calceine, thermal, strontium chloride). Merced ID shall monitor the initial success of outplanted native salmonids and conduct periodic monitoring until population goals are achieved. Merced ID shall evaluate the reproductive success of outplanted native salmonids to determine, in consultation with and subject to approval by MRERG, if population goals are met. Merced ID shall adjust the conservation schedule and numbers subject to approval of MRERG.

(j) In consultation with the MRERG, Merced ID shall evaluate the effectiveness of the Conservation Program, including the success of alternate outplanting strategies, reproductive success of outplanted fish, or other aspects of the Conservation Program pursuant to the MRERG. The results of effectiveness monitoring will be included in the annual report.

(k) The reporting and implementation schedule for the native salmonid conservation facility is summarized below.

PM&E Measure Activity Schedule

PM&E Measure	Activity Schedule
Complete Implementation Planning	Within three years of license issuance
Facility Draft and Final Engineering Plans	Within four years of license issuance
Facility Construction	Within six years of license issuance
Begin Operations	Within six years of license issuance
Construction Compliance Monitoring	Report within seven years of license issuance
Annual Reports	Every year
Five-year Status Reports	Every fifth year

B. Rationale

Cumulatively, the diversions and operations of Merced ID’s water-and-power complex affect anadromous fishes and their habitats below Crocker-Huffman Dam, as well as their historic habitats above Crocker-Huffman Dam and in and above the FERC-licensed facilities. Project effects include depletion of native stocks, limitation of access to suitable natural

spawning habitat, and diversion of water impacting temperature and habitat below the Project. Introduction into Project reservoirs of fish bred purely for production creates a conflict between recreational use and the biological goal of restoring genetically appropriate fish to the watershed. Historically, fish planted in Project reservoirs affected the Merced River both upstream and downstream of the Project, causing introgression of production-based fish with native stocks. With the Department of Fish and Wildlife's current policy of stocking reservoirs with salmonids that are not capable of reproducing (in order to avoid introgression with native fish), there is no opportunity to create new self-sustaining fish populations in Project reservoirs or to enhance existing populations. In substantial part, this measure speaks to the need to re-create self-sustaining salmon and trout populations.

A conservation hatchery could also be used to mitigate disastrous outcomes from droughts, allowing use of naturally produced broodstock to recolonize the Merced River. 2014 is a textbook example of how, during Critically Dry water-years and multiple dry year sequences, flow releases may not be sufficient to support a self-sustaining, viable fall-run Chinook Salmon and Steelhead trout population in the lower Merced River. The hatchery should be constructed near a persistent source of cold water (e.g., near Lake McClure), and may require the flexibility to employ chillers in cases where the water in Lake McClure becomes too warm to sustain cold water species.

The major purpose of the measure is to offset or mitigate for Project effects on native salmonid fish populations and fisheries in the Merced River. It will provide enhancement of depleted stocks within, above, and below the Project, provide increased access of salmon and trout to suitable upstream spawning and rearing habitat, and a refugium for maintenance of native salmonid genetic broodstock. The measure will add to the benefits of fish stocking as proposed in Licensee's Proposed Measure AQR3 (Lake McClure and McSwain Reservoir Fish Stocking).

C. Consultation

Merced ID neither initiated nor held consultations on the proposed measure.

D. Cost of Measure

A specific capital cost for building rearing raceways, water supply system, and hatchery building/grounds is estimated to be between \$1 million and \$10 million.⁴² Federal and state funds for restoration of anadromous salmonids are available for matching applicant's funding. Annual operation and maintenance costs: \$400,000 per year, 30 years.

⁴² Estimate based upon similar San Joaquin River spring-run Restoration Hatchery. Accessed on 5/13/2014: <http://www.cacoastkeeper.org/news/returning-salmon-to-san-joaquin-river-will-cost-millions>

IV. Conservation Groups' Recommendation: Merced River Ecological Resource Group Consultation, Monitoring and Research

A. Recommended Measure

1. Consultation

Within 3 months of license issuance and in coordination with California Department of Fish and Wildlife (CDFW), State Water Resources Control Board (SWRCB), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and U.S. Bureau of Land Management (BLM), (collectively, the Resource Agencies), and other interested stakeholders, Merced ID shall establish a Merced River Ecological Resource Group (MRERG).

The MRERG shall be consulted at least annually on the implementation of license measures, implementation of monitoring plans, review and evaluation of monitoring data, and review and evaluation of required facility modifications. The date of the annual consultation meeting will be mutually agreed to by Merced ID and the Resource Agencies, but in general should be held by April 15. At least 30 days in advance of the meeting, Merced ID shall notify the operator of the adjacent Merced Falls Project (Commission Project No. 2467) and other interested stakeholders of the meeting location, time and agenda. Merced ID shall attempt to coordinate the meeting so interested agencies and other stakeholders may attend.

Merced ID shall make available to the MRERG, at least two weeks prior to the meeting, an operations and maintenance plan for the year in which the meeting occurs. In addition, Merced ID shall present results from current-year monitoring of special status species as well as any additional information that has been compiled for the Project area, including progress reports on other resource measures. The goals of this meeting are to share information, mutually agree upon planned maintenance activities, identify concerns that Resource Agencies or other MRERG members may have regarding activities and their potential effects on sensitive resources, and reach consensus on any measures required to avoid or mitigate potential effects. In addition, the goal of the meeting shall be to review and discuss the results of implementing the instream flow and reservoir-related conditions, results of monitoring, and other issues related to preserving and protecting ecological values affected by the Project.

Consultation shall include, but not be limited to:

- A status report regarding implementation of license conditions, including those instream flow measures that have specific timing and duration components that require annual adjustment.
- Results of any monitoring studies performed over the previous year in formats agreed to by the Resource Agencies and Merced ID during development of implementation plans.
- Review of any non-routine maintenance.
- Discussion of any foreseeable changes to Project facilities or features.
- Discussion of any necessary revisions or modifications to implementation plans approved as part of this license.

- Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to delisting of a species or, to incorporate new knowledge about a species requiring protection.
- Discussion of elements of current-year maintenance plans, e.g. road and trail maintenance.
- Discussion of any planned pesticide use.

A record of the annual meeting shall be kept by Merced ID and shall include any recommendations made by Resources Agencies for the protection of natural resources. Merced ID shall file the meeting record with the Commission no later than June 30 of each year.

For at least the first five years after license issuance, in addition to the annual meeting, the MRERG shall meet at least quarterly to consult on license measures such as instream flow, water temperature management planning, hatchery operations, spawning and floodplain habitat restoration, and reservoir stocking, where the measures provide for the collaborative development or adaptive management of specific terms. To the extent that some resource measures may be highly technical and narrowly focused, the MRERG will have the option to designate issue-specific working groups to address technical matters and report back to the larger MRERG. After the first five years, the frequency of MRERG meetings may be modified to less than quarterly (but no less than annually), if all interested parties concur with the proposed change in schedule.

2. Monitoring and research elements for Salmonid Species-Habitat Restoration

The Licensee shall fully fund the following twelve monitoring elements and all targeted research needed to implement habitat restoration projects:

- (A) Conduct annual carcass surveys to estimate fall-run Chinook salmon escapement, monitor spawning distribution, and collect scales, otolith, length, sex, coded-wire-tag, and fecundity data.
- (B) Conduct, two years out of every five, summer snorkel surveys of *O. mykiss* between Crocker-Huffman Dam and the Highway 59 bridge to determine abundance, size distribution, spawning distribution, and summer distribution.
- (C) Conduct annual age analysis for Chinook salmon and *O. mykiss* downstream of Crocker-Huffman Dam using scale and otolith samples (where destructive sampling is permitted).
- (D) Conduct rotary-screw-trap monitoring near Hopeton and Hageman.
 - (D1) Modify traps or the streambed to provide adequate trap capture efficiencies at all flows.
 - (D2) Ensure that traps rotate continuously by removing accumulated debris, particularly during storm events.
 - (D3) Conduct sufficient capture efficiency tests at all flows with all fish sizes.
 - (D4) Operate traps annually from at least mid-January through the end of May.
 - (D5) A representative sample of the juveniles should be weighed and measured. Sample size should be determined by statistical analysis.

- (E) Operate a counting weir in the lower Merced River to estimate salmon and CCV steelhead escapement and to provide data on the percentage of females and migration timing.
- (F) Conduct otolith analysis of adult Chinook salmon and *O. mykiss* annually to estimate the contribution of naturally produced fry-, parr-, and smolt-sized outmigrants to the adult population, the percentage of hatchery fish in the population, the percentage of anadromous *O. mykiss*, and the source of adult salmon strays collected in the Merced River.
- (G) Conduct annual genetic monitoring of Chinook salmon and *O. mykiss* to evaluate changes in genetic diversity at the population level as flow and habitat measures are implemented. The analysis should include an evaluation of habitat restoration, drought conditions, and the percentage of time that temperatures exceed temperature targets on genetic diversity.
- (H) Continuously monitor water temperatures at approximately 5-mile intervals between Exchequer Dam and the Shaffer Bridge.
- (I) Conduct an HEC-5Q analysis of the effects of restored channel morphology, floodplain width, and riparian tree canopies on water temperatures in the Project Area.
- (J) Collect annual microclimate data, including air temperature, wind speed, solar radiation, relative humidity, and soil moisture in areas with mature riparian forests, at least 30 meters in diameter, and in degraded areas between Merced Falls Dam and the Shaffer Bridge. Use the data to calibrate the HEC-5Q analysis described in Monitoring Measure I.
- (K) Monitor sediment size data at spawning habitats between Crocker-Huffman Dam and the Shaffer Bridge to help determine where spawning gravel augmentation is needed. Monitor spawner use at restoration sites and nearby control sites.
- (L) Conduct long-term monitoring of riparian vegetation at floodplain restoration sites.

B. Rationale

Information obtained from the various monitoring elements will allow the Merced ID, the Resource Agencies, and the MRERG to adaptively manage all Project elements and conservation measures throughout the life of the Project to ensure their effectiveness and to protect and enhance fish and wildlife resources. The objectives for monitoring and research shall be to: (1) assess the viability of the naturally produced fall-run Chinook salmon, *O. mykiss*, and other native fish species according to the criteria described by Lindley et al. (2007)⁴³ and (2) determine whether the restoration projects have been effective.

C. Consultation

Merced ID held 3 meetings regarding establishment of a Merced River Technical Advisory Committee: 4/25/2013, 7/25/2013 and 8/22/2013. In the initial meeting, Merced ID presented its “Relicensing: Strawman Flow Proposal.” There was considerable discussion regarding coordination of research and monitoring of anadromous species and flow schedules in this and subsequent meetings. Merced ID, Resource Agencies, and Conservation Groups did not reach agreement on the Merced ID committee proposal, but all agreed that the concept was a good one.

⁴³ Lindley et al., 2007. Framework for assessing viability of threatened and endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin. *San Francisco Estuary and Watershed Science* 5 (1): 1-26. Accessed on July 5, 2014 at: <http://escholarship.org/uc/item/3653x9xc?query=Lindley%202007;hitNum=1#page-1>.

D. Cost of Measure

\$400,000-600,000 per year; 30 years.

V. Conservation Groups' Comments and Recommendations on Proposed Measure GEN1: Annual Consultation with BLM

A. Recommended Measure

Merced ID shall annually consult with Bureau of Land Management (BLM). The date of the joint consultation meeting will be mutually agreed to by Merced ID and BLM but, in general, should be held by April 15. At least 30 days in advance of the meeting, Merced ID shall notify BLM and other interested stakeholders, confirming the meeting location, time and agenda. At the same time, Merced ID shall also provide notice to the: United States Fish and Wildlife Service (FWS); National Park Service (NPS); National Oceanic and Atmospheric Administration, National Marine Fishery Service (NMFS); California State Department of Fish and Wildlife (CDFW); and the State Water Resources Control Board (SWRCB), who may choose to participate in the meeting.

Merced ID shall make available, at least 2 weeks prior to the meeting, an operations and maintenance plan for the year in which the meeting occurs to BLM, interested stakeholders, and the agencies listed above. Merced ID shall present results from current-year monitoring of noxious weeds and special status species as well as any additional information that has been compiled for the Project area, including progress reports on other resource measures. The goals of this meeting are to share information, reach agreement on planned maintenance activities, identify concerns that BLM may have regarding activities and their potential effects on sensitive resources, and as needed discuss measures required to avoid or mitigate potential effects. In addition, the goal of the meeting shall be to review and discuss the results of implementing the streamflow and reservoir-related conditions, results of monitoring, and other issues related to preserving and protecting ecological values affected by the Project.

Consultation shall include, but not be limited to:

- A status report regarding implementation of license conditions.
- Results of any monitoring studies performed over the previous year in formats agreed to by BLM and Merced ID during development of implementation plans.
- Review of any non-routine maintenance.
- Discussion of any foreseeable changes to Project facilities or features.
- Discussion of any necessary revisions or modifications to resource implementation plans, including trails and recreational facilities, approved as part of this license.
- Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to de-listing of species or, to incorporate new knowledge about a species requiring protection.
- Discussion of needed protection measures for newly discovered cultural resource sites.
- Discussion of elements of current-year maintenance plans, e.g. road and trail maintenance.
- Discussion of any planned pesticide use.

A record of the meeting shall be kept by the Merced ID and shall include any recommendations made by BLM for the protection of BLM land and resources. Merced ID shall file the meeting record, if requested, with FERC no later than 60 days following the meeting.

Copies of other reports related to Project safety and non-compliance shall be submitted to BLM, CDFW, FWS, NPS, NMFS, and SWRCB concurrently with submittal to the FERC. These include, but are not limited to: any non-compliance report filed by the Merced ID, geologic or seismic reports, and structural safety reports for facilities located on or affecting BLM lands.

A copy of the record for the previous water year regarding stream flow, study reports, and other pertinent records shall be provided to BLM, CDFW, FWS, NPS, NMFS, and SWRCB by Merced ID at least 60 days prior to the meeting date, unless otherwise agreed.

Copies of other reports related to monitoring, Project safety and non-compliance on BLM land shall be submitted to BLM concurrently with submittal to the FERC, with the goal of providing the material to BLM no later than 90 days in advance of the annual meeting. These include, but are not limited to: any non-compliance report filed by Merced ID, geologic or seismic reports, and structural safety reports for facilities.

During the first several years of license implementation, it is likely that more consultation than just one annual meeting will be required, given the complexity of these projects.

B. Rationale

Merced ID proposed an Annual Consultation with BLM in its Amended FLA.⁴⁴ Conservation Groups agree that this is a necessary measure to ensure coordination and implementation of plans and activities involving Merced ID, Resource Agencies, and interested stakeholders. The purpose and basis for such an annual meeting is to: 1) assure that Merced ID's planned activities are efficiently coordinated to the extent possible with BLM activities; 2) make BLM and other applicable agencies aware of Merced ID's planned O&M activities on federal land; and 3) make Merced ID aware of all pertinent BLM orders, rules and policies that might affect Merced ID's planned activities. It is appropriate that Merced ID hold the meeting in the first quarter of each year with BLM and other agencies to discuss Merced ID's planned Project O&M activities for that calendar year since Merced ID normally develops an annual maintenance plan early in each calendar year. By documenting the meeting in a filing with FERC, Merced ID will inform not only the Commission and BLM but also the public of its planned maintenance activities.

C. Consultation

Merced ID held 9 meetings regarding Recreation PM&Es: 4/28/2011, 6/23/2011, 8/25/2011, 4/19/2012, 2/28/2013, 4/25/2013, 5/25/2013, 7/10/2013, and 8/22/2013 in which there was some discussion regarding coordination of recreation activities and recreation plan for

⁴⁴ FERC eLibrary Accession # 20120227-5055; Merced ID's Proposed Measure GEN 1.

the Project. Merced ID generally agreed that an annual coordination meeting with BLM was necessary, at a minimum. Relicensing Participants requested that they be informed regarding the Merced ID-BLM coordination activities.

D. Cost of measure

\$10,000 per year for 30 years.

VI. Conservation Groups' Comments and Recommendations on Proposed Measure G&S2: Development of Large Woody Debris Management Plan

A. Recommended Measure

Within six months of license issuance, Licensee shall develop a plan that : 1) describes potential locations of Large Woody Debris (LWD) collection in Lakes McClure and McSwain; 2) describes potential options for moving the LWD collected in Lakes McClure and McSwain Reservoir into the Merced River downstream of Crocker-Huffman Diversion Dam; 3) identifies suitable locations in the Merced River downstream of Crocker-Huffman Diversion Dam where LWD can be placed within the active channel; 4) consults with State and Federal agencies regarding effects of LWD on safety or maintenance of bridges; and 5) evaluates the efficacy, costs, and permitting requirements of providing permanent anchorage to the placed LWD.

For purposes of the LWD enhancement and management plan “LWD” is defined as structurally sound logs, with or without root wads, that are ≥ 3 feet long and ≥ 8 inches in diameter at 5 feet from the large end.

The composition of LWD augmentation pieces should adhere to the following criteria:

- (1) At least 20% of all LWD augmentation pieces should have rootwads attached;
- (2) At least 50% of all augmentation pieces should be > 10 ft long, and 20% should be greater than 18 ft long;
- (3) At least 50% of the augmentation pieces should have diameters > 12 inch, and 20% should have diameters > 24 inch.

The majority of LWD augmentation pieces will be sourced from local collection at Project reservoirs. However, due to the episodic nature of LWD transport and unquantified rate of LWD delivery into the Project reservoirs, it may be necessary to use resources outside of the Project to source the LWD augmentation pieces. Outside sources should strive to match the species composition native to the Merced watershed, but may also include local hardwoods used in agricultural production (e.g., walnut trees) that are being retired from production. If necessary, selection of LWD sources from non-Project facilities should be done in coordination with the MRERG.

1. Large Woody Debris Guidance and Action

Following any large peak flow (defined as any peak flow equal to or greater than a 1.5-yr return interval flow) into Lake McClure, it will be necessary within a matter of weeks to boat survey the upper reaches of Lake McClure Reservoir (e.g., in the vicinity of the Highway 49 Bridge crossing and all the way upstream to the reservoir backwater extent) and secure (likely by cabling together) all LWD floating in the reservoir or perched on the reservoir margin such that it can be relocated and retrieved for removal later that season.⁴⁵ LWD found in Project Reservoirs should be removed on an annual basis and stored and stockpiled for placement in downstream reaches.

The Licensees shall initially place 80 to 100 pieces of wood (depending, in part, on quantity and caliber of wood available) in the five restoration reaches per year (RM 55 to 32.8). The annual wood augmentation should continue until a wood frequency of 100 pieces per mile of stream channel is reached (about 6 pieces per 100 m of channel length) on average throughout the restoration reaches. Wood frequencies within a given reach may be higher or lower than the target average frequency, but a minimum frequency of 70 pieces per mile should be met in each of the sub-reaches. Once an average frequency of 100 pieces per mile is met, monitoring (frequency dependent on peak flow occurrence) will determine whether the target frequencies are being maintained throughout the subreaches (minimum of 70 pieces per mile within a subreach and an average of 100 pieces per mile over the entire length of the action area). Additional LWD augmentation will be necessary if LWD frequencies fall below the targets.

LWD should be placed within the active channel, side channels and on floodplain benches. At least 50% of the augmentation wood should be placed in the active channel. Configurations of large wood will include single (1), aggregate (2-10 pieces), and jams (>10 pieces), in orientations similar to naturally occurring large wood.

2. Mapping of LWD in the lower Merced River from RM 55 to 32.8

A comprehensive map that includes a GIS database should be developed to inventory all LWD in the lower Merced restoration reached. The mapping effort should begin with an initial inventory of existing wood, which would then help prioritize the initial LWD augmentation efforts. The map should be updated as LWD is augmented each year. For water years when a high flow occurs sufficient to mobilize and transport LWD, the augmentation reaches should be remapped in order to verify existing wood locations. The flow magnitude that would trigger an annual comprehensive mapping effort is estimated to be 4,000 cfs; this flow magnitude should be evaluated and revised by the MRERG based on information from monitoring and mapping efforts.

⁴⁵ Based on communications with Merced ID, wood that enters Lake McClure apparently sinks within a relatively short time frame and does not reach New Exchequer Dam.

B. Background and Rationale

This measure is a modification of Merced ID's Proposed Measure G&S2 for development of a Large Woody Material Management Plan.⁴⁶ It includes Merced ID's proposed measure by incorporation of a developed plan that: 1) describes existing locations of Large Woody Debris (LWD) collection in Lakes McClure and McSwain; 2) describes potential options for moving the LWD collected in Lakes McClure and McSwain into the Merced River downstream of Crocker-Huffman Diversion Dam; 3) identifies suitable locations in the Merced River downstream of Crocker-Huffman Diversion Dam where LWD can be placed within the active channel; and 4) consults with State and Federal agencies regarding effects of LWD on safety or maintenance of bridges.

The Conservation Groups' (CGs) modifications include: 1) securing State or local approvals for implementation (i.e. a California Fish and Game Code §1600 *et seq.* permit from California Department of Fish and Wildlife), 2) developing the plan under the technical guidance of the Merced River Ecological Resource Group (MRERG)⁴⁷, and 3) filing of the plan, including evidence of consultation with MRERG, with the Commission for approval and input to the plan as directed by the Commission.

Project facilities entrap and eliminate the entire upper watershed supply of LWD to the lower Merced River. The vast majority of LWD supply from the upper Merced watershed sinks and or decays within Lake McClure, and does not reach the protective booms near New Exchequer Dam. The Project inundates more than 27 miles of stream that formerly supported riparian forests which provided a source of LWD for the lower Merced River. The Project also significantly reduces the frequency and magnitude of high flows in the lower Merced River, which in turn limits wood transport, and reduces geomorphic processes that often provide local sources of wood to the channel through channel migration, bank erosion, and exhumation of wood buried in floodplains. While other historic anthropogenic impacts have likely contributed to the lower Merced River being nearly devoid of in-channel wood, the ongoing Project effects of eliminating upstream wood inputs and inundation of over 27 miles of former riparian habitat are two factors that impede the ability of the lower Merced River to develop properly functioning habitat related to LWD.

In a 2005 survey, the lower Merced River had only between 8-10 LWD pieces per mile in all reaches below Project facilities; this is an extremely low density of LWD pieces for a Central Valley floor river.⁴⁸ In a 2012 Central Valley floor river survey including the Merced River, the median number of pieces of large wood per mile for 19 California streams supporting Chinook salmon was 130 pieces per mile, and there were no (0) pieces of large wood in the Merced River reaches that were surveyed.⁴⁹ A 2010 study of the Mokelumne River found 112 large pieces of

⁴⁶ Large Woody Material is referred to as Large Woody Debris in this measure.

⁴⁷ See Section IV, *supra*.

⁴⁸ Stillwater Sciences. 2007. The Merced River Alliance Project: Interim Biological Monitoring and Assessment Report. Stillwater Sciences, Berkeley, California.

⁴⁹ Albertson, L.K., L.E.Koenig, B.L. Lewis, S.C. Zeug, L.R. Harrison, B.J. Cardinale. 2012. How does restored habitat for Chinook salmon (*Oncorhynchus tshawytscha*) in California compare with other Chinook streams? River Res. Applic. 2012. Published online by John Wiley & Sons, Ltd. DOI: 10.1002/rra.1604.

wood per mile;⁵⁰ the Mokelumne is a nearby San Joaquin Valley watershed with a highly regulated river that supports anadromous fish. When the lower Merced River is compared with 19 other California salmonid bearing streams, it has very limited salmonid rearing habitat attributes, with practically no LWD, no undercut banks, and only a sparsely populated riparian forest edge.⁵¹ The lack of all of these particularly important salmon rearing attributes is unique to the lower Merced River. These factors, coupled with high water temperatures, are likely to be significant stressors or limiting factors for salmonids in this river.⁵² When compared to other San Joaquin Valley regulated rivers, the Merced River, downstream of the Project, is severely lacking in wood. This lack of LWD is thought to be a primary stressor or limiting factor for juvenile salmonid habitat under current Project operations. Thus, adding LWD along with gravel, and providing a new instream flow schedule that mimics the natural hydrograph, would substantially enhance lower Merced River salmonid habitats over its currently degraded state.

All reaches of the lower Merced River were found to be deficient in numbers of pieces of LWD that occur:

- Merced Falls Reach: (RM 55.0 – 52.0) Merced Falls Dam to Crocker-Huffman Diversion Dam.
- Snelling Reach: (RM 52.0 - 46.4) Crocker-Huffman Diversion Dam to Snelling “G” Street Bridge.
- Dredger Tailings Reach 2 (DTR2): (RM 46.4 - 44.7) Snelling “G” Street Bridge to DTR2 node.
- Hwy. 59 Reach: (RM 44.7 - 42.0) DTR2 node to Highway 59 Bridge.
- Shaffer Reach: (RM 42.0 - 32.8) Highway 59 Bridge to Shaffer Bridge.

LWD provides a number of environmental or ecological benefits to river habitat.⁵³ LWD can create complex in-channel hydraulics that promote zones of scour and deposition, help accumulate spawning gravels for Chinook salmon and steelhead, support substrate rejuvenation and hyporheic flows, provide hydraulic refugia, and enhance pool formation. All of these processes create cover and refugia zones for juvenile fish rearing and adult fish holding.

C. Consultation

Licensee initiated no consultations on the proposed measure. On April 25, 2013, Merced ID presented a “Strawman Flow Proposal” to Relicensing Participants including a LWD component, but no agreements were reached. The measure was presented to the Relicensing Participants in the Amended Final License Application to FERC on April 23, 2014.

⁵⁰ Senter, A.E. and G.B. Pasternack. 2010. Large wood aids spawning Chinook salmon (*Oncorhynchus tshawytscha*) in marginal habitat on a regulated river in California. River Res. Applic. 2010. Published online by John Wiley & Sons, Ltd. DOI: 10.1002/rra.1388.

⁵¹ Albertson et al, op cit, p. 1.

⁵² *Id.*, p. 7.

⁵³ Senter and Pasternack, op cit, p. 14.

D. Cost of Measure

Estimated costs assume a one-time cost of \$30,000 to develop a plan, engineering design for the plan and coordination with permitting agencies and MRERG. Annually, between 400 and 500 pieces of LWD are to be moved from McClure/McSwain Lakes. Truck transport costs are estimated at \$14,000 per year.⁵⁴ Collection and loading costs are estimated at \$22,000 per year. Placement costs are estimated at \$15,000 per year. Monitoring cost is estimated at \$10,000 per year. Total estimated annual cost is \$61,000.

VII. Conservation Groups' Comments and Recommendations on Proposed Measure: Gravel Augmentation and Rehabilitation

A. Recommended Measure

1. Licensee shall provide and place 20,000 yd³ of properly-sized gravel annually in the Merced River between Merced Falls Dam (RM 54.9) and Shaffer Bridge (RM 32.5) to meet the long-term target of additional spawning surface area of 64,139 m² (above the currently available 4,385 m²) to support fish production to support the AFRP doubling goal target for the Merced River. Once this target spawning surface area is achieved, Licensee shall place gravel annually to maintain volume so that there is no net loss of spawning habitat thereafter (we estimate this will require 2,600 yds³ to 10,400 yds³ per annum).
2. Licensee shall establish a Merced River Ecological Resource Group (MRERG) within two years of license issuance. The annual implementation program for gravel augmentation will be managed as an “adaptive management” program by the recommended Merced River Ecological Resource Group with representatives from federal and state agency fisheries technical experts, Conservation Groups, and Merced ID.
3. Within three years of license issuance, Licensee shall develop a plan that: 1) describes potential locations of gravel collection for the reaches of the Merced River between Merced Falls Dam and Shaffer Bridge; 2) describes potential geographic and physical options for providing and placing gravel in the reaches of the Merced River between Merced Falls Dam to Shaffer Bridge; and 3) includes consultation with MRERG regarding annual gravel augmentation with respect to geomorphic and hydrologic annual variations. The plan shall identify and analyze distinct reaches (or sub-reaches) of the Merced Falls Dam to Shaffer Bridge reach, based upon geomorphic and hydrologic factors, access, and suitability for gravel addition. It shall also report and evaluate any legal constraints on gravel placement, and any federal, state, or local permits that may be needed. When it is completed, Licensee shall provide the plan to the MRERG for a three month review. After the review period, Licensee shall assemble recommended edits,

⁵⁴ 28-35 log loads at 60 miles per load per year (\$400 per load).

revisions and additions, prepare a final report, including an appendix documenting consultation, and file the plan with FERC.

4. Once gravel placement has commenced, Licensee shall annually monitor the quantity and quality of placed gravel, the locations and durations of placement, the results of monitoring of the placement of gravels, and subsequent geomorphic distributions (movement, representative gravel quality, and bedload morphological change) and improvement (additions) of suitable anadromous salmonid spawning and rearing habitat by individual reach. Licensee shall document this monitoring in a draft annual report that it will provide to the MRERG by March 1 of each year. After a two month review period by the MRERG, Licensee shall assemble recommended edits, revisions and additions, prepare a final report, and submit the report to FERC. The final report will include an appendix documenting annual consultation with the MRERG, including both general adaptive management consultation and consultation specific to the annual report.

B. Rationale

The existing need for gravel augmentation on the Merced River is derived from the historic and current impacts due largely to the creation and operation of the Merced River Hydroelectric Project and its predecessor, Old Exchequer Dam. There is a deficit of 540,000 tons to 1,640,000 tons (~450,000 to 1,400,00 yd³) of suitable gravel for anadromous fish habitat that needs to be returned to the river as initial injections of coarse gravel, including oversized rock to raise the channel bed and surface material in the AFRP-recommended size range to support improvement of spawning and rearing habitats for salmon and *O. mykiss*.

Please see Appendix II for a detailed discussion of the development of this measure and for documented rationale.

C. Consultation

Licensee proposed no gravel augmentation measure for the lower Merced River in its Amended FLA. Resource agencies and Conservation Groups presented several iterations of straw proposals for gravel augmentation in relicensing meetings in 2013.

D. Cost of Measure

It is our understanding that gravel is readily available at no cost on land owned by the California Department of Fish and Wildlife that is adjacent to the lower Merced River.

Estimated cost of sorting available gravel ranges from ~\$11.00 to \$15.00 per yd³. Estimated cost of transporting gravel to restoration sites is an additional ~\$4.00/yd³. These cost estimates are based on restoration activities on the Merced River from 2009 to 2013 performed by the Merced Fly Fishing Club and U.S. Fish and Wildlife Service's Anadromous Fish Restoration Program.

Annual Cost for 20,000 yd³ of sorted and delivered gravel would thus range from \$300,000 to \$380,000. This is substantial savings due to the availability of on-site gravel that does not need to be purchased or transported long distances. (Estimates of purchased and transported gravel are as high as \$25/ton). Estimated annual cost of MRERG activities related to gravel placement is \$25,000. Estimated annual cost for gravel monitoring and report is \$75,000.

VIII. Conservation Groups' Comments and Recommendations on Proposed Measure ARQ3: Lake McClure and McSwain Reservoir Fish Stocking

A. Recommended Modification to Licensee's Proposed Measure

This measure proposes to modify Merced ID's Proposed Measure ARQ3 for Lake McClure and McSwain Reservoir Fish Stocking by substituting production hatchery fish for genetically compatible conservation hatchery fish. It relies upon implementation of Conservation Groups' Native Salmonid Conservation Management Program measure for both development of a fish propagation facility and a plan for development and implementation.

Beginning in the first full calendar year after license issuance, Merced ID shall annually stock fish in Lake McClure and McSwain Reservoir at the average annual historic levels, which are:

- Lake McClure
 - Between 444,600^{55,56} and 973,000 Southern Sierra Nevada DPS watershed genetically-compatible⁵⁷ fingerling rainbow trout⁵⁸ with a 5-year running average target number of 667,200 fish (i.e., approximately 200 fish per pound)⁵⁹
 - Between 40,000^{60,61} and 90,000 fingerling Central Valley spring-run Chinook salmon ESU⁶² with a 5-year running average target number of 60,000 fish (i.e., approximately 200 fish per pound)

⁵⁵ Costs per fingerling versus catchable-sized rainbow trout from United States Department of Agriculture, National Agricultural Statistics Service 2014 Trout Production Report. Available at:

<http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1172>

⁵⁶ Conversion of catchable-to-fingerling costs based upon: 2014 California catchable costs (\$2.08 per fish) and 2014 National (average) fingerling costs (0.15 per fish). Report declined to state value of California fingerling costs. *Id.*

⁵⁷ National Marine Fisheries Service . 2009. "Public Draft Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead." NMFS, Southwest Region, Sacramento, California. October 7, 2009. Available at:

<http://swr.nmfs.noaa.gov/recovery/centralvalleyplan.htm>.

⁵⁸ California Fish and Game Commission. 2006. Fisheries Policies for anadromous rainbow trout. Article I, See:

<http://www.fgc.ca.gov/policy/p2fish.aspx>.

⁵⁹ Baseline catchable trout numbers are maintenance of historic rainbow trout plants under proposed Measure AQR-3. CGs proposed condition substitutes catchable trout numbers for equivalent fingerling trout number, which results in equivalent cost to the Merced ID's proposed measure.

⁶⁰ Eliminate planting non-native species in the Merced River historic spring-run Chinook salmon habitat. Planting kokanee salmon. California Fish and Game Commission "Salmon" Fisheries Policy Article VIII. See:

<http://www.fgc.ca.gov/policy/p2fish.aspx>.

- McSwain Reservoir

- Between 1,000 and 2,000 genetically-compatible catchable-sized rainbow trout with a 5-year running average target number of 1,500 fish

Merced ID shall stock the fish in one to four events per species between March 1 and October 31 of each year. If California Department of Fish and Wildlife or another party stocks fish in either reservoir in any year, Merced ID's stocking effects as described in this measure will make up the difference between what is stocked by California Department of Fish and Wildlife or another party and the annual fish-stocking targets described above.

In years of low reservoir levels, Merced ID may reduce the stocking volume and frequency, in consultation with California Department of Fish and Wildlife.

Merced ID's preferred approach for fish stocking is to contract with California Department of Fish and Wildlife and/or State-registered private hatcheries to raise and plant the average target number and weight of fish each year. If fish are supplied by private hatcheries, Merced ID shall ensure that fish are drawn from the appropriate genetically-compatible strains for each species to restore and maintain historic Merced River watershed genetic characteristics. Merced ID shall deny delivery of any fish, regardless of the source, if Merced ID has any reason to suspect the fish contain harmful pathogens or parasites that could impact resident fish populations.

Merced ID shall collect angler data during the Recreation User Survey, to be conducted every twelfth year of the license, as part of the Recreation Facilities Plan, including questions related to the quality of the angling experience and species of fish caught. Merced ID shall review the results of the Recreation User Surveys with Cal Fish and Wildlife after the final report is completed.

Merced ID may implement a fee for anglers at Lake McClure and McSwain Reservoir to support the fish-stocking program. The primary use of collected fees shall be to purchase fish for stocking. Surplus annual fees, if any, may be used for the purchase of fish in subsequent years or the improvement of services and facilities at Lake McClure and McSwain Reservoir as they relate to fishing. Merced ID shall utilize the funds in the manner that best supports the fish-stocking program and the angling experience at the reservoirs.

B. Rationale

Merced ID has proposed Measure AQR3 for stocking rainbow trout, kokanee salmon, and fall-run Chinook salmon in Lake McClure and rainbow trout in Lake McSwain at average historical numbers (= baseline condition). Conservation Groups support supplemental planting of native fishes, where populations are reduced because of hydroelectric projects, irrigation

⁶¹ Kokanee salmon fingerling numbers added to Chinook salmon plantings.

⁶² California Fish and Game Commission "Salmon" Fisheries Policy Article VIII.

diversions, natural environmental conditions, over-fishing pressure, or unknown causes of population reductions. Both locations for fish stocking are in an anadromous salmonid watershed. Anadromous Rainbow Trout and Salmon Policies of the California Fish and Game Commission⁶³ include statements that “salmon shall be managed to protect, restore, and maintain the populations and genetic integrity of all identifiable stocks” and that “domesticated or non-native species will not be planted, or fisheries based on them will not be developed or maintained, in drainages of salmon waters, where in the opinion of the Department (of Fish and Wildlife), they may adversely affect native salmon populations.” The National Marine Fisheries Service (2009)⁶⁴ has identified potential reintroduction and recovery scenarios for the Southern Sierra Nevada Central Valley Steelhead DPS and the Central Valley Spring-Run Chinook Salmon ESU in the upper Merced River, above Lake McClure. Salmon and rainbow trout in Lake McClure can volitionally pass into the upper Merced River under certain flow conditions.⁶⁵

The proposed measure is likely to be implemented within the Licensee’s proposed schedule, beginning the first year after license issuance. The project-related effects on fishing and natural populations of anadromous salmonids are mitigated by this proposed measure. All stocking of salmonid species occurs within the Project Boundary.

The steps necessary to implement the measure and the preliminary schedule for implementing the measures are contained in Conservation Groups’ Native Salmonid Conservation Management Program.

The purpose of the measure and benefits that they would provide are presented in the Licensee’s Proposed Measure AQR3 Lake McClure and McSwain Reservoir Fish Stocking. Conservation Groups’ proposal added the benefits of providing native anadromous salmonid fish stocking, contrasting with Licensee’s proposal for stocking non-native fish.

C. Consultation

The Licensee initiated no consultations on the propose measure. It was presented to the Relicensing Participants in the Amended Final Application to FERC on April 23, 2014.⁶⁶

D. Cost of Measure

The costs of both fish-stocking sources will be similar to historic (baseline) conditions. On average, Licensee will have to plant 727,200 fingerling salmon and trout, which should cost \$109,000 per year.⁶⁷ The Licensee suggests that some of the costs will be recovered by others

⁶³ California Fish and Game Commission. Available at: <http://www.fgc.ca.gov/policy/p2fish.aspx>

⁶⁴ National Marine Fisheries Service (NMFS). 2009. "Public Draft Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead." NMFS, Southwest Region, Sacramento, California. October 7, 2009. Available at: <http://swr.nmfs.noaa.gov/recovery/centralvalleyplan.htm>.

⁶⁵ NMFS 2013 Merced River fish barrier survey. Available at FERC eLibrary, Accession # 20140106-5047.

⁶⁶ See eLibrary no. 20140423-5220

⁶⁷ This is part of the operation and maintenance cost identified in CGs Measure No. 3.

entities planting fish and/or by charging fees for trout fishing in Lake McClure or Lake McSwain.

IX. Conservation Groups' Comments and Recommendations on the Amended Recreational Facilities Plan

A. Recommended Modification to Licensee's Proposed Measure

Conservation Groups have met on numerous occasions with representatives of the land-management and resource agencies and the applicant over the course of more than four years to discuss the specifics of the Recreational Facilities Plan with particular emphasis on the enhancement of whitewater boating and recreational trails. In July 2013, substantial agreement was reached between the BLM and Merced ID on measures to improve existing area recreational resources and potentially to provide for their significant expansion in the future.⁶⁸ At this meeting, Merced ID agreed in principle to the inclusion of a number of PM&E measures. Some of these are embodied in Merced ID's Amended Recreation Facilities Plan in the Final Amended License Application. They include the following:

- Construction of a whitewater rafting take-out and associated facilities near the Shepherd's Point Primitive campground at Bagby;⁶⁹
- Construction of a whitewater rafting take-out and associated facilities near Sherlock Creek at Lake McClure, contingent upon BLM securing public access and ensuring an adequate road to the location via Mosher Road;⁷⁰
- Restoration of the historic trail on the south side of the River from Sherlock Creek to the Bagby campground and construction of a bridge across the River connecting to the trail on the north side of the River, contingent upon securing the necessary legal access/easements along the south side trail and BLM's construction of a bridge across the North Fork,⁷¹
- Preparation of a comprehensive conceptual trail development plan which identifies and evaluates three different potential trail corridors from Bagby to McSwain.

At the July 2013 meeting, Merced ID also discussed its prior tentative commitments to the construction of a trailhead parking area north of the Bagby bridge, to the construction of a trail connecting the parking lot to the trail on the north side of the River, and to annual maintenance of the existing trail along the north side of the River from the Project Boundary up to the Bagby Bridge once the reservoir has receded. This latter tentative commitment appears in the Amended Recreation Facilities Plan.⁷² This trail alignment, although blocked by intermittent

⁶⁸ Portions of this agreement are expected to be contained in the Department of the Interior's 4(e) conditions and 10(a) recommendations.

⁶⁹ Amended FLA, Vol. 1: Amended Exhibits A, B, and D for Merced River Hydroelectric Project (Amended Exhibits A, B, and D), Merced ID, 2014, eLibrary no. 201440423-5220. Amended Recreation Facilities Plan (Amended Rec Facilities Plan), Attachment A, Figure A-4, p A-5. p. 1159 (map), pdf pagination.

⁷⁰ *Id.*, p. 1160 (map), pdf pagination.

⁷¹ Amended FLA, Exhibits A, B, and D, 2014, § 3.0 Recreation Facilities Measures, pp. 1132–1133, pdf pagination.

⁷² Amended FLA Exhibits A, B, and D, 2014, § 3.0 Recreation Facilities Measures, pp. 1132–1133, pdf pagination.

reservoir high water, does have the advantage of facilitating easy reservoir/river access and not requiring unnecessary elevation gain to reach Highway 49. Thus this is a desirable element of a Recreational Facilities Plan.

However, the construction of a formal north side parking area and trail to it do not appear in the Amended Recreational Facilities Plan. Apparently, Merced ID prefers that such facilities be constructed by the BLM without licensee involvement. If true, we believe that the Commission, BLM, and the Licensee still need to sort this out. While there is informal roadside parking north of the Highway 49 Bridge, the most extensive and useful parking available for Northside trail users in the absence of formal north side parking would be at Bagby, south of the Highway 49 Bridge. While pedestrian or even equestrian use of the highway bridge can and does occur, safety issues argue for the alternative north side arrangements developed in the Recreation Facilities Plan discussions.

B. Boating Take-Outs, Facilities and Information

There are three paddling reaches directly impacted by Merced River Hydroelectric Project, FERC Project 2179, one of which is also affected by the Merced Falls Hydroelectric Project, FERC Project 2467:

- Briceburg to Bagby on the Wild and Scenic Merced River – (FERC Project 2179)
- Merced Falls to Crocker-Huffman Dam – (FERC Project 2179 & 2467)
- Crocker-Huffman Dam to Shaffer Bridge – (FERC Project 2179)

The Conservation Groups made previous PM&E proposals for these river sections with respect to access, flow information and recreational flow.

Overall, Merced ID has addressed the access issues for Briceburg to Bagby on the Wild and Scenic Merced River in Proposed Measure RR1, which would implement the Amended Recreation Facilities Plan within 1 year of license issuance. These matters included the amount of flat-water paddling due to the fluctuating reservoir levels, the distance from the river shore to the take-out facilities due to fluctuating reservoir levels and the inundation of the Old Yosemite Railroad trail on the north river shore used for scouting, portaging and emergencies. Moving the take-out and providing capital improvements to Shepherd's Point Primitive Area will shorten flat-water paddling by one mile and will reduce the distance to carry equipment from the shoreline.

At this time, however, Conservation Groups note there is no provision in the Amended Recreation Facilities Plan for actual access to the Shepherd's Point take-out facility and would like Merced ID to provide and maintain public access to this area on a year-round basis. We expect that the BLM will share that view in its conditions and recommendations. Additional Merced ID proposals to maintain existing public access and to clear the Old Yosemite Railroad trail of fallen debris and siltation once the reservoir has receded to 830-ft elevation will ensure continued through access on a trail historically used by whitewater paddlers. Connecting this

historical trail to a trailhead parking area north of the Bagby Bridge would eliminate the need to carry boating equipment across the bridge for transport in cases of a portaging emergency. Further Merced ID plans to develop an upstream take-out facility at Sherlock Creek, contingent upon BLM securing public access and upgrading the road conditions, would again, significantly reduce the paddle out and would be well received by the boating community.

Boating access from Merced Falls to Crocker-Huffman Diversion Dam is addressed to some extent within the relicensing process through Merced ID's Proposed Measure RR2, which will provide river access signage at Crocker-Huffman Dam. Additionally, the proposed action of PG&E will operate and maintain Project 2467 and its recreational sites as they have been historically. Conservation Groups note this includes the boating portage route around Merced Falls Dam, as discussed during the NGO site visit on May 2, 2012. Outside of the license, the Conservation Groups look forward to working with Merced ID on maintaining a portage route around Crocker-Huffman Dam and constructing a formal put-in/take-out below Crocker-Huffman Dam. Conservation Groups note and support the current work of Merced ID & Merced County to secure grant funding through the Integrated Regional Water Management Plan (IRWMP) to design and construct a formal non-motorized boating put-in/take-out below Crocker-Huffman Dam. It is also commendable that Merced ID and Merced County recognize in the Crocker-Huffman Dam project description the need to "create a more functional stretch of river for river boaters, anglers and other river recreationists by providing defined, improved and managed upstream and downstream river reach access sites."

In terms of the reach from Crocker-Huffman Dam to Shaffer Bridge, flow information was identified as key to informing the public of the opportune time to paddle on this section of the lower Merced. Typically, to get a full picture of all boatable Merced River reaches, it is helpful to have an idea of the flows at all access points. Therefore, with real-time information already publicly available at Merced Falls and Snelling (CDEC gauges MMF & MSN), the Conservation Groups support Merced ID's Proposed Measure RR2 to supply flow information at Shaffer Bridge either by working with DWR to include this information on CDEC or by providing the information internally through Merced ID's website.

The NGO's commend Merced ID for incorporating a significant number of these measures into the Recreational Facilities Plan. The contemplated measures pertaining to recreational trails will revitalize the longstanding efforts to establish a trail along the Merced River corridor from Merced to Yosemite National Park. The concept of the Merced River Trail has been endorsed by a wide variety of governmental agencies (BLM, NPS, USFS, Yosemite National Park, Mariposa and Merced Counties, Merced County Association of Governments) as well as by Merced ID, and led to the formation of the Merced River Trail Steering Committee as early as 1989.⁷³ Efforts to implement the vision of the Merced River Trail lost momentum in the

⁷³ See Conservation Groups Supplemental Information Filing to their comments on the Draft License Application,, eLibrary no. 20120104-5037: Mariposa County Bicycle Transportation and Pedestrian Plan, pp. 106–108, pdf pagination; and Merced River Trail, pp. 68-100 pdf pagination. These supplements were excerpted from the Mariposa County Bicycle Transportation and Pedestrian Plan, p. 123 pdf; and the Mariposa County Bicycle Transportation and Pedestrian Plan, p. 132 pdf.

early 1990s, but the facilities, maintenance actions, and renewed planning efforts will revitalize that effort.

The Recreational Facilities Plan will establish the recreational priorities and opportunities in the area for the next 50 years. Inclusion of agency recommendations and conditions in the Recreational Facilities Plan and PM&E measures, along with a sincere, good-faith effort to conduct a timely evaluation of the potential to enhance and extend recreational trails along the Merced River corridor alongside Project reservoirs, are essential steps towards realizing regional recreational opportunities, goals and objectives such as the BLM Merced River Plan, the Merced River Trail concept, and the recently adopted Mariposa County Bicycle and Pedestrian Transportation Plan.

NEPA ANALYSIS AND ALTERNATIVES

Pursuant to its obligations under NEPA and FPA, the Commission must assess the Project's direct and cumulative effects on the environment, develop and adopt appropriate protection, mitigation or enhancement measures to mitigate the adverse effects of the Project, and develop and analyze reasonable alternatives to the proposed Project.

X. Alternatives

NEPA expressly requires that a NEPA document consider a reasonable range of alternatives to the proposed action which would achieve a given purpose. *See* 42 U.S.C. § 4332(2)(E); 40 C.F.R. § 1508.9(b). An EIS must include those reasonable alternatives that “are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.” *See* CEQ, “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” 46 Fed. Reg. 18026 (Mar. 23, 1981), Question 2a. FERC is required to “[i]nclude reasonable alternatives not within [its] jurisdiction.” *See* 18 CFR § 1502.14.

The Commission should analyze the following alternatives in its NEPA document: 1) a Bay-Delta Water Quality Control Plan Alternative that describes within it the following: a) State Board Phase I Flow Alternative that evaluates a license assuming action by the State Board as outlined in its forthcoming environmental document for the San Joaquin portion of the update of the Plan; b) the Conservation Groups’ Flow Proposal Alternative in combination with similar requirements on the Tuolumne and the Stanislaus; and c) a Low Exports Alternative that may be required pursuant to Phase II of the Bay-Delta Plan update; and 2) a Salmon and Steelhead Reintroduction and Fish Passage Alternative that evaluates a) the consequences of re-establishing passage through Crocker-Huffman Dam; and b) opportunities for reintroducing salmon and steelhead upstream of New Exchequer Dam.

A. Bay-Delta Water Quality Control Plan Alternatives

The State Water Resources Control Board (State Board) is in the process of updating the Bay-Delta Plan “to restore and protect the Delta ecosystem.”⁷⁴ Phase I of this process includes updating “flow objectives to protect fish and wildlife in the San Joaquin River (SJR) and its salmon-bearing tributaries,” and developing a plan to implement those objectives.⁷⁵ The Amended FLA mentions the Water Quality planning efforts but provides little analysis regarding the significant effect it may have on the Merced watershed and Project storage and operations.⁷⁶ It is reasonably foreseeable that the State Board will adopt new flow objectives that will affect the Merced River during the term of the new license; indeed, since the State Board may use its Clean Water Act §401 Water Quality Certification authority as a legal basis for portions of the Bay-Delta Plan update, it is foreseeable that portions of the update may be directly incorporated into the Certification and thus the new FERC license for the Merced River Project.⁷⁷

In addition, Phase II of the update of the Water Quality Control Plan will consider changes to export restrictions and requirements on the south Delta pumps of the State Water Project and the Central Valley Project. The Amended FLA describes the effect that export operations have on water and anadromous fish that originate in the Merced River:

Once the San Joaquin River enters the Delta at Vernalis, its flow is heavily influenced by state and federal Delta export facilities, part of the State Water Project (SWP) and federal Central Valley Project (CVP). Average annual diversions by the two projects have increased by a factor of two in the past 20 years. The winter and spring export rate from the State and federal Delta pumping facilities exceeds the inflow to the Delta from the San Joaquin basin at nearly all times except during flood conditions. As a result of export operations, much of the San Joaquin River outflow never reaches the San Francisco Bay.

Analyses of out-migrating Chinook salmon paired-release studies in the San Joaquin River associated with the VAMP study have shown that state and federal export rates, as well as the operation of hydraulic barriers designed to prevent fish entrainment at the pumps, are important determinants in the survival of out-migrating juvenile Chinook salmon in the Delta.⁷⁸

In combination, these phases of the Bay-Delta Plan update will significantly influence the efficacy of flow requirements established for the Merced River Project (and also for the

⁷⁴ SWRCB, “Bay Delta Plan Update: Draft San Joaquin River Flow and Southern Delta Salinity Requirements Released for Public Comment,” *available at* http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2012_sed/docs/sjr_factsheet2012.pdf.

⁷⁵ *Id.*

⁷⁶ Amended FLA, Ex. E, p. E3-36.

⁷⁷ See Revised Notice of Preparation for “Update to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Water Quality Objectives for the Protection of Southern Delta Agricultural Beneficial Uses; San Joaquin River Flow Objectives for the Protection of Fish and Wildlife Beneficial Uses; and the Program of Implementation for Those Objectives, Attachment 2, p. 4. Available at http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/notice_sjr_flow_southern_delta_scoping_mtg_with_attachments.pdf

⁷⁸ Amended FLA, Ex. E, p. E3-22.

Tuolumne River, immediately to the north, where the Don Pedro Project is also currently undergoing relicensing).

In an extraordinary FERC proceeding in 2009 relating to the Tuolumne River and the operation of the nearby Don Pedro Project, consultants for Turlock and Modesto irrigation districts and for the City and County of San Francisco pointed strongly to the importance of coordination of San Joaquin tributary flows and of Delta export operations. For instance, biologist Noah Hume testified:

Perhaps the largest improvements in conditions affecting Chinook salmon could take place in the San Joaquin River and Delta. ... Other than drastic reductions in exports from the state and federal pumping facilities, major flow factors affecting Chinook salmon downstream of the Don Pedro Project include management of San Joaquin River basin outflows during winter and spring from all three tributaries (Stanislaus, Tuolumne and Merced) and implementation of seasonal barriers in the Delta that shift migration routes and improve survival. ... Absent major reductions in export levels, however, it is unlikely that predator habitat suitability and predation levels in the Delta will markedly improve.⁷⁹

Testifying on behalf of the City and County of San Francisco, biologist Peter Moyle also placed great emphasis on lower San Joaquin River flow and on Delta operations:

Numbers of adult spawners of anadromous fish (fall Chinook salmon, steelhead, and Pacific lamprey) are the outcome of four interacting factors that affect survival of the fish: (a) habitat in the Tuolumne River, (b) combined spring outflows of the Merced, Tuolumne, Stanislaus and San Joaquin rivers, (c) conditions in the San Francisco estuary, especially the Delta, and (d) conditions in the ocean.⁸⁰

Dr. Moyle unfortunately used this observation to downplay the importance of Tuolumne River flows, stating:

However, significant increases in the abundance of anadromous fishes are more likely to result from improvements of conditions outside the system, especially in the lower San Joaquin River and Delta, than from further changes to the Tuolumne River itself. Once survival rates of salmon and steelhead have improved significantly outside the river, then factors limiting survival and growth within the river are more likely to become important.⁸¹

In the Merced River Project relicensing, Commission staff has regrettably narrowed the geographic scope of consideration in the extreme, and declined even to study effects of non-power operations of the Project on resources in the Merced River upstream of the FERC flow compliance gauge at Shaffer Bridge.⁸² The DEIS is the Commission's opportunity to correct this

⁷⁹ Testimony of Noah Hume, eLibrary no. 20090914-5160, pp. 16-17.

⁸⁰ Testimony of Peter Moyle, eLibrary no. 20090914-5175, p. 10.

⁸¹ *Id.*, pp. 21-22.

⁸² See e.g. Director's Study Plan Determination, eLibrary no. 20110401-3042, Appendix B, p. 5ff.

error by looking at the three factors as defined by Dr. Moyle, as quoted above, that can be managed (tributary habitat, combined lower San Joaquin flows, Delta operations). By careful use of a robust alternatives analysis, the DEIS can provide decision-makers with the analysis of these key factors that NEPA requires.

1. State Board Phase I Flow Alternative

The DEIS should analyze the preferred alternative set forth in the State Water Board's forthcoming recirculated Substitute Environmental Document (SED) for Phase I of the Update of the Bay-Delta Water Quality Control Plan. If the recirculated SED is not made public in time for analysis in the DEIS, the DEIS should use existing information (much of which is already in the Merced River Project relicensing record) to analyze a scenario that requires release from the Merced River of 40% of February – June unimpaired flow from each of the three major San Joaquin River tributaries, including the Merced.

2. Conservation Groups' Merced River Flow Proposal Alternative

The DEIS should evaluate the Conservation Groups' flow proposal for the Merced River relicensing as an alternative. This would be significantly different from the Phase I State Board Alternative because the Conservation Groups' address Critically Dry years and dry-year sequences in a way that corrects a major problem with the State Board's approach as it has been articulated to date. Even if the State Board effectively addresses Critically Dry years and dry-year sequences, the flow amounts are different enough to provide an important basis of comparison. In analyzing this alternative, the DEIS should evaluate the effects on the lower San Joaquin River of combining Conservation Groups' flow proposal for the Merced River with a similar 60% of February – June unimpaired flow requirement for the Tuolumne and Stanislaus rivers (with the same reduced monthly requirements based on water-year type). The water-balance model developed for use in the Don Pedro relicensing will be helpful in this analysis for the Tuolumne River.

3. Low Exports Alternative

The DEIS should evaluate an alternative that evaluates Licensee's proposal, the Phase I alternative, and Conservation Groups' flow alternative in combination with reduced exports at the SWP and CVP south Delta pumps.

The Vernalis Adaptive Management Program, which was discontinued after 2010, combined a mid-April to mid-May pulse flow with export reductions during the period of the pulse flow. While many observers agreed that the approach was conceptually sound, positive results were limited; much of this limitation was attributed to the small magnitudes of the pulses. As the VAMP review panel put it:

VAMP flows generally have been too restricted in range and have included more low flows than high flow. From an experimental or adaptive management perspective, it is

impossible to learn much about effects of higher flows without having a chance to observe survival (and carry out acoustic tagging experiments) at such higher flows.⁸³

In testimony before the State Water Board in February, 2010, Dr. Christina Swanson of the Bay Institute recommended specific export limitations during biologically critical spring periods. Dr. Swanson concluded:

... current Delta hydrodynamic conditions resulting from the combined effects of low San Joaquin River inflows and high export rates are almost always inadequate to provide conditions necessary to support or sustain San Joaquin Basin salmon population abundances or meet these objectives. We also concluded that only Delta hydrodynamic conditions with a VF:E [Vernalis Flow to Exports] ratios that were greater than 4.0 consistently corresponded to salmon abundance levels that approached the population abundance objectives for this species.⁸⁴

Dr. Swanson recommends the following measures:

1. “Hydrodynamic conditions in the Delta should be managed to maintain OMR flows that are greater than -2000 cfs during the period from October-June in all years.”⁸⁵
2. “Hydrodynamic conditions in the Delta should be managed to maintain a March–June VF:E ratio that is greater than 4.0 in 40% of years, greater than 3.0 in 60% of years, greater than 2.0 in 80% of years and greater than 1.0 in 100% of years.”⁸⁶

We recommend that the Commission use these recommendations as the cornerstone of export limitations for evaluation in combination with the flow alternatives listed above. The geographic scope of this analysis, at a minimum, should extend to the confluence of the San Joaquin and Sacramento Rivers, consistent with Commission direction on listed species in Scoping Document 2:

“At this time, we have tentatively identified the upper and lower Merced River, including the San Joaquin between the confluence with the Merced and the Sacramento Rivers as our geographic scope of analysis of federally listed species.”⁸⁷

With this geographic extent, the Commission must consider Delta smelt. Scoping Document 2 does not identify a geographic scope for non-listed aquatic species, but it is reasonable to use this geographic scope for other anadromous species including fall-run Chinook and for additional pelagic species such as longfin smelt.

⁸³ The Vernalis Adaptive Management Program (VAMP): Report Of The 2010 Review Panel, p. 9. Available at: <http://www.sjrg.org/technicalreport/2009/2010-VAMP-Peer-Review-Panel-Report.pdf>

⁸⁴ Testimony of Christina Swanson Regarding Flow Criteria for the Delta Necessary to Protect Public Trust Resources: Delta Hydrodynamics, February 16, 2010, p. 11. Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/bay_inst/tbi_e_xh4.pdf

⁸⁵ *Id.*

⁸⁶ *Id.*, p. 12.

⁸⁷ Scoping Document 2, p. 10, eLibrary no. 20090417-3001.

B. Fish Passage and Salmon and Steelhead Reintroduction Alternatives

Merced ID states in the Amended FLA that “[t]he Crocker-Huffman Diversion Dam represents the lowest downstream barrier to fish and is not part of the Project. As a result, fish-passage issues as related to the Project offer no additional incremental effect.”⁸⁸ Because Crocker-Huffman Dam is technically not a Project facility, the FLA does not propose measures to facilitate fish passage past Crocker-Huffman Dam, nor does it offer any actions to improve habitat accessibility for anadromous fish in the upper Merced River. Conservation Groups strongly dispute the position of Merced ID. The Commission has broad jurisdiction and authority to issue a new license which integrates and protects all beneficial uses of waterways and their resources (including fish and wildlife resources) and includes measures necessary to protect those resources.

The Amended FLA fails to acknowledge that populations of anadromous fish have deteriorated to extremely low numbers in the Merced River due in large part to the continued operation, maintenance and new development of the Project. Improving anadromous fish access to historic habitat is a rational means of partially mitigating that impact consistent with the direction of several Resource Agency comprehensive plans for the waterway. Conservation Groups recommend that the Commission’s DEIS acknowledge that Merced ID’s and PGE’s continued operation and maintenance of the Projects directly and cumulatively affect volitional anadromous fish passage. The DEIS should analyze measures that will improve anadromous fish access to historic habitat as a means of partially mitigating the effect.

1. Crocker-Huffman fish ladder

A Fish Passage Alternative should include analysis of actions to make operable the currently non-functional fish ladder owned and operated by Merced ID at Crocker-Huffman Diversion Dam. A 2013 fish-passage report by NMFS⁸⁹ evaluated the Crocker-Huffman to Merced Falls reach and concluded the following:

Fish habitat for the species of interest within this reach consists of limited spawning, holding and rearing habitat for salmonids. It also provides temperature refugia for salmonids during migration. The reach is heavily modified, but still provides suitable habitat that will benefit the fishes of interest if passage is provided. This reach has been the subject of several recent studies including Vogel (2007)⁹⁰ and Stillwater Sciences (2008).⁹¹

The report also concluded that several habitat modifications or improvements in this reach could improve habitats for species of interest. The favorable temperature regime and the

⁸⁸ Amended FLA, p. E3.3.3-180.

⁸⁹ Merced River Fish Passage Feasibility Study, Technical report prepared by Ecosystem Sciences, GHD, and GeoEngineers under contract with NOAA’s National Marine Fisheries Service, West Coast Region. 2013. See eLibrary no. 20140106-5047.

⁹⁰ California Fish and Game Commission “Salmon” Fisheries Policy, Article VIII.

⁹¹ Stillwater Sciences 2008. Biological monitoring and assessment, Vol II Final Report. Prepared for East Merced Resource Conservation District and State Water Resources Control Board. Stillwater Sciences, Berkeley, California. 296 p.

presence of existing spawning habitat indicate that an investigation into possible aquatic habitat improvements, including side channel construction and gravel augmentation, should be considered.⁹²

This analysis is consistent with previous Commission and Resource Agency direction. For instance, in response to a draft SWRCB order directing MID to re-operate the fish ladder at Crocker-Huffman Dam to minimize potential negative impacts to anadromous fish and their habitat from temporarily modified operations, the Commission objected, noting that:

“re-operation of the fish ladder on a temporary basis related to the temporary variance request should not be required at this time, and that decision should be deferred to the current relicensing proceeding.”⁹³

The Commission further noted that:

“re-operation of the fish ladder is being analyzed in the relicensing proceeding for this project, and requiring this measure at this time may preclude any ongoing analyses and negotiations among project stakeholders.”⁹⁴

Additionally, both California Department of Fish and Wildlife and National Marine Fisheries Service have requested that Merced ID restore the existing Crocker-Huffman fish ladder to operable condition. The relicensing proceeding has produced little information or serious analysis related to restoring the Crocker-Huffman fish ladder to operation. Therefore such analysis must occur in the DEIS.

2. Re-establishing access for anadromous fish to the upper Merced River

The Alternative should also analyze actions to re-establish access to historic fish habitat in the upper Merced River. Historically, fall-run and spring-run Chinook salmon, and also steelhead, had significantly more available habitat as a result of their access to spawning and rearing habitats in the higher elevation river reaches of the upper Merced River. There are several efforts occurring in the watershed to assess and prioritize fish passage and reintroduction actions to this upper river habitat, yet the Amended FLA does not consider an alternative that includes such actions.

The most notable efforts to assess reintroduction actions are being facilitated by NMFS. In early spring of 2011, NMFS contracted with two consultants to develop and assess a range of reasonable fish-passage alternatives for the four dams on the Merced River. The consultants built upon an earlier NMFS Technical Memorandum.⁹⁵ The consultants used existing information, field data collection efforts assisted by NMFS, and fish-passage feasibility information from

⁹² NMFS, 2013, op cit, p. 12.

⁹³ Commission Order Granting Extension of Temporary Variance of Minimum Flow and Minimum Pool Requirements Under Articles 40 and 44. May 2, 2014. See eLibrary no. 20140502-3017.

⁹⁴ Id.

⁹⁵ NMFS. 2010. NOAA Technical Memorandum. Evaluation of fish passage and habitat conditions in the Merced River reach between New Exchequer Dam and Crocker-Huffman Dam. NOAA Fisheries, Southwest Region, Fisheries Bioengineering Branch, NOAA NMFS, Sacramento, CA 20 p.

other similar projects from across NMFS' West Coast Region. The results of this additional effort were published in a 2013 Technical Report, which concludes that feasible alternatives exist for passing fish at each dam, including McSwain Dam (bypass channel) and New Exchequer Dam (collection and transport).⁹⁶ The relevant information that has been generated from NMFS is readily available and should be utilized by the Commission to inform the development and analysis of this Alternative in the NEPA document.

XI. Comments Regarding Cumulative Effects of the Proposed Action

The Commission's NEPA document must address cumulative effects, which are defined as

“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” (40 C.F.R. § 1508.7.)

The Commission's policy is to “address and consider cumulative impact issues at original licensing and relicensing *to the fullest extent possible* consistent with the Commission's statutory responsibility to avoid undue delay in the relicensing process and to avoid undue delay in the amelioration of individual project impacts at relicensing.” 18 C.F.R. § 2.23 (emphasis added).

The new licenses, in conjunction with present water supply operations, will cumulatively affect fish and wildlife and recreation resources. The Amended FLA does not include sufficient information regarding other present and/or reasonably foreseeable future actions to facilitate the Commission's evaluation of the Project's cumulative effects. For instance, the Amended FLA does not include actions to restore fish access above Crocker-Huffman or New Exchequer Dam, information regarding the update to the State Water Resources Control Board Water Quality Control Plan, the San Joaquin River Restoration Program, or foreseeable changed operations at Don Pedro Dam. However, information regarding these actions is publicly available. We request that the Commission utilize all available sources to inform its cumulative effects discussion in the DEIS consistent with the comments below.

A. Fish Passage

The Amended FLA does not propose to mitigate the Project's cumulative effects on fish-passage given the non-Project status of Crocker-Huffman Diversion Dam.

“The Crocker-Huffman Diversion Dam represents the lowest downstream barrier to fish and is not part of the Project. As a result, fish-passage issues as related to the Project offer no additional incremental effect.”⁹⁷

As noted in the Alternatives section, Conservation Groups' strongly dispute the position of Merced ID. The Commission has broad jurisdiction and authority to issue a new license

⁹⁶ NMFS, 2013, *Merced River Fish Passage Feasibility Study*, op cit, p. 19.

⁹⁷ Amended FLA, p. E3.3.3-180.

which integrates and protects all beneficial uses of waterways and their resources (including fish and wildlife resources) and includes measures necessary to protect those resources. Improving anadromous fish access to historic habitat is a necessary means of partially mitigating the Project's impact on anadromous fish populations consistent with the direction of several Resource Agency comprehensive plans for the waterway.

Given the notable progress and current trajectory of the fish and wildlife agency planning efforts and Water Board regulatory efforts (*see* Fish Passage and Salmon and Steelhead Reintroduction Alternative, *supra* p. 53), it is reasonably foreseeable that the fish ladder at Crocker-Huffman Diversion Dam will be restored to functionality, and/or that salmon and steelhead will be reintroduced above New Exchequer Dam during the term of the new license. The DEIS must analyze the continuing and incremental impacts of the Project on fish passage and develop appropriate mitigation measures that reduce the impacts attributable to the existence and use of Project facilities.

B. San Joaquin River Restoration Settlement Act

The FLA identifies the San Joaquin River Restoration Program (SJRRP) as “[o]ne program that will have significant effects on streamflows in the basin...”⁹⁸ However, the Amended FLA does not include adequate information to determine how reoperation of Friant Dam pursuant to the SJRRP affects the project's cumulative effects on salmon and steelhead in the San Joaquin River. The FLA instead indicates that the program's funding and timelines are too uncertain to ascertain the “effects the SJRRP will have on the Merced River anadromous salmonids or on fish in the San Joaquin River.”⁹⁹

Despite the misgivings of the Licensee, the SJRRP is on track to reintroduce Central Valley spring-run Chinook salmon to the San Joaquin River by 2025 and should be considered within the time span of the new license. In fact, Central Valley spring-run Chinook salmon juveniles were released into the San Joaquin River this year near its confluence with the Merced River for study purposes, the results of which will inform the longer-term reintroduction efforts.¹⁰⁰ The SJRRP expects some of these juveniles to return to the watershed as adults in 2017.¹⁰¹ The continued reintroduction of Central Valley spring-run Chinook salmon to the San Joaquin River above Merced River confluence in the 2014 to 2025 timeframe will likely cause this species to stray into the Merced River. Reintroduction would therefore occur within FERC's SD2 described geographic scope for cumulative effects on federally listed species.¹⁰²

The Commission's DEIS should highlight and discuss the Project's cumulative effects on spring-run Chinook salmon and steelhead in the San Joaquin that are likely to result from reasonably foreseeable San Joaquin River restoration actions, such as reoperation of Friant Dam. For instance, increased releases from Friant Dam in February and March will provide additional cold water to the San Joaquin River, including the reach downstream of the confluence with the

⁹⁸ Amended FLA at Ex. E., p. E3-33.

⁹⁹ *Id.*

¹⁰⁰ San Joaquin River Restoration Program Update, May 2014. Available at: restoresjr.net/program_library/01-General_Outreach/Prog_Updates/2014/20140507-SJRRP-Update-v9-WEB.pdf

¹⁰¹ *Id.*

¹⁰² *See* SD2, *op cit*, p. 10.

Merced River. This may improve success of rearing and outmigration of juvenile salmon and steelhead from the Merced River. During April, increased releases will likely transition in water temperature, and depending on magnitude and ambient meteorology may have more mixed results, improving flow but having variable effect on water temperatures. In May and especially in June, increased releases from Friant may have reduced benefits or even adverse impacts to out-migrating Merced River salmon and steelhead because of thermal increases. In addition, the Licensee and Commission should consider potential measures that would create benefits for Merced River salmon and steelhead from increased Friant releases. Increased releases from Friant Dam may result in fall water temperatures in the San Joaquin River downstream of Merced River confluence that inhibit upstream migration of Merced River salmon; however, depending on temperature, this increased mainstem San Joaquin flow may encourage or enhance upstream fall-run salmon migration, particularly as temperatures cool.

Documents that could inform this analysis include the San Joaquin River Restoration Program Programmatic EIS/EIR prepared by the Bureau of Reclamation and California Department of Water Resources, the Salmon Conservation and Research Facility and Related Management Actions Project EIR prepared by California Department of Fish and Wildlife, and the Final 10(j) Rule establishing a Nonessential Experimental Population of Central Valley spring-run Chinook salmon prepared by National Marine Fisheries Service.¹⁰³

Finally, the Licensee should prepare a Biological Assessment (BA) for spring-run Chinook salmon and initiate ESA and CESA consultations with appropriate federal and state fisheries agencies.

C. Update of Bay-Delta Water Quality Control Plan

It is reasonably foreseeable that the State Board will adopt new flow objectives that will affect the Merced River during the term of the new license. Therefore, it is also reasonably foreseeable that the State Board will take action, through its water rights or water quality certification authority, to ensure the implementation of objectives adopted in the Bay-Delta Plan. This should be considered in the cumulative effects analysis.

The Amended FLA discusses Delta Water Quality Control Planning, including the Bay-Delta Water Quality Control Plan.¹⁰⁴ The State Board is in the process of updating the Bay-Delta Plan “to restore and protect the Delta ecosystem.”¹⁰⁵ Phase I of this process includes

¹⁰³ Bureau of Reclamation, Department of Water Resources. July 2012. Final Program Environmental Impact Statement/Report for the San Joaquin River Restoration Program. Available at www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=2940;

California Department of Fish and Wildlife (CDFW). June 2014. Salmon Conservation and Research Facility and Related Management Actions Project Final EIR. Available at www.dfg.ca.gov/regions/4/sanjoaquinriver/#docs;

National Marine Fisheries Service (NMFS). 2013. 50 CFR Part 223 (Final Rule). 10(j) Rule establishing a Nonessential Experimental Population of Central Valley spring-run Chinook salmon below Friant Dam in the San Joaquin River, Available at www.westcoast.fisheries.noaa.gov/publications/frn/2013/78fr79622.pdf.

¹⁰⁴ Amended FLA at Ex. E, p. E33-36.

¹⁰⁵ SWRCB, “Bay Delta Plan Update: Draft San Joaquin River Flow and Southern Delta Salinity Requirements Released for Public Comment,” *available at* http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2012_sed/docs/sjr_factsheet2012.pdf.

updating “flow objectives to protect fish and wildlife in the San Joaquin River (SJR) and its salmon-bearing tributaries,” and developing a plan to implement those objectives.¹⁰⁶ Phase II of the update of the Water Quality Control Plan will consider changes to export restrictions and requirements on the south Delta pumps of the State Water Project and the Central Valley Project.

In the Amended FLA, Merced ID acknowledges that the process is ongoing, but states that it is uncertain how implementation of objectives will affect the Merced River and that, due in part to expected legal actions, the “outcome of the SWRCB’s actions will likely remain uncertain for many years.”¹⁰⁷ We disagree with the implication that a thorough analysis is not warranted given lack of information. There is sufficient information available to conduct a thorough cumulative effects analysis.

The State Board intends to issue a final draft Substitute Environmental Document (SED) later this year.¹⁰⁸ Accordingly, the DEIS should consider how Project operations would be modified in response to implementation of the preferred alternative set forth in the State Board’s forthcoming recirculated Substitute Environmental Document (SED) for Phase I of the Update of the Bay-Delta Water Quality Control Plan. However, if the recirculated SED is not made public in time for analysis in the DEIS, the DEIS should use existing information to consider how Project operations would be modified in response to a requirement to release 40% of February – June unimpaired flow from each of the three major San Joaquin River tributaries, including the Merced. The State Board’s Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives, (February, 2012) that was prepared in support of Phase I of the Update contains sufficient detail regarding the alternatives that are currently under consideration by the State Board to inform this analysis. This document, and the Delta Flow Criteria Report, strongly support the likelihood that increased flows from the Merced River will be required.

Additionally, it is reasonably foreseeable that the State Board will require reduced exports at the SWP and CVP south Delta pumps during the biologically critical spring periods as part of its Phase 2 decision (See “Reduced Exports Alternative,” Section X, *supra*). The Amended FLA notes that export operations affect water and anadromous fish that originate in the Merced River, notably the survival of outmigrating juvenile Chinook salmon in the Delta.¹⁰⁹ The DEIS should analyze how aquatic resources will be cumulatively affected by State Board actions including adoption of export restrictions at SWP and CVP south Delta pumps.

In conclusion, the DEIS should consider how Project operations would be modified in response to implementation of the preferred alternative set forth in the State Board’s forthcoming recirculated Substitute Environmental Document (SED) for Phase I. The analysis should also include a sub-part that considers how aquatic resources will be cumulatively affected by the above action in conjunction with a State Board action to restrict exports at SWP and CVP south Delta pumps during the spring period. The geographic scope of this analysis, at a minimum,

¹⁰⁶ *Id.*

¹⁰⁷ Amended FLA at Ex. E, p. E3-36.

¹⁰⁸ SWRCB, “Bay Delta Planning Efforts Fact Sheet,” *available at* www.swrcb.ca.gov/publications_forms/publications/factsheets/docs/bd/pineff_fs.pdf

¹⁰⁹ Amended FLA, Ex. E, p. E3-22. *See* additional analysis in section on NEPA alternatives, *supra*.

should extend downstream to the confluence of the San Joaquin and Sacramento Rivers, consistent with Commission direction on listed species, as cited above.¹¹⁰

With this geographic extent, the Commission must consider Delta smelt. The Scoping Document does not identify a geographic scope for non-listed aquatic species, but it is reasonable to use this for other anadromous species including fall-run Chinook and for additional pelagic species such as longfin smelt.

D. Water Management in the Tuolumne River

The Merced and the Tuolumne Rivers each contain FERC-jurisdictional rim dams that essentially control all instream flows downstream of the storage reservoirs (the Don Pedro Project on the Tuolumne River is on a relicensing timeline approximately two years behind the Merced River Projects). FERC EIS's for both the Merced and Tuolumne relicensings must consider the effects of each proposed action on the other, and how the combined actions can best address flow requirements in the lower San Joaquin River and the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

The Amended FLA notes that “flows in the lower San Joaquin River are primarily governed by tributary inflows from the Merced, Tuolumne and Stanislaus Rivers.”¹¹¹ In addition, it acknowledges the State Water Board’s Bay-Delta Water Quality Control Planning efforts.¹¹² However, the Amended FLA does not expressly acknowledge the regulation of flow on the Tuolumne River as an out-of-basin project that could cumulatively affect resources in the Bay-Delta. It also doesn’t discuss any reasonably foreseeable changes at the Project facilities on the Tuolumne River in response to the State Board’s adoption of new water quality objectives. As discussed above, the State Board is proposing to set an objective that requires a release of a percent of February - June unimpaired flow into the Merced, Stanislaus, and Tuolumne Rivers in order to protect water resources and aquatic resources in the Bay-Delta.

The Don Pedro Project (P-2299) has two times the storage of the Merced River Project and more potential miles of over-summering habitat for *O. mykiss*. Given the importance of the releases from the Tuolumne River to protecting the fishery in the Bay-Delta, it is extremely important that the Commission consider how changes to the Merced River Project operations may affect operations at the Don Pedro facilities. Conversely, it is also important to understand how changes to the Don Pedro Project operations may affect operations at the Merced River Project facilities. The Commission is well-situated to undertake this analysis given its regulatory authority over both projects, its access to large amounts of relevant information contained in the records of both relicensing processes, and its overriding duty to consider how projects are best suited to comprehensive plans of development. Accordingly, the DEIS should consider how Don Pedro Project operations would be modified or coordinated in response to implementation of the preferred alternative set forth in the State Water Board’s forthcoming recirculated Substitute Environmental Document (SED) for Phase I of the Update of the Bay-Delta Water Quality Control Plan. As suggested above, if the recirculated SED is not made public in time

¹¹⁰ Scoping Document 2, p. 10

¹¹¹ Amended FLA, p. 3-9.

¹¹² Amended FLA at Ex. E, p. E3.3-36.

for analysis in the DEIS, the DEIS should use existing information to consider how Don Pedro Project operations would be modified in response to a requirement to release 40% of February – June unimpaired flow from each of the three major San Joaquin River tributaries, including the Merced.

COMPREHENSIVE PLANNING

The Amended FLA does not provide the Commission sufficient information to meet the comprehensive development standard articulated in section 10(a)(1) of the Federal Power Act (FPA). As stated above, the Amended FLA neglects to provide relevant information or analysis regarding actions to restore fish access above Crocker-Huffman or New Exchequer Dam, the update to the State Water Resources Control Board Water Quality Control Plan, the San Joaquin River Restoration Program, and foreseeable changed operations at Don Pedro Dam. Conservation Groups' recommend that the Commission consider these actions in the DEIS as separate alternatives and as part of the cumulative effects analysis, consistent with our comments above. Such analysis must be completed to provide a sufficient basis for a Commission finding that the new license is in the public interest and best suited to a comprehensive plan of development for the river. 16 U.S.C. § 803(a)(1).

CONCLUSION

Thank you for the opportunity to provide comments and recommendations in response to the Notice of Ready for Environmental Analysis for the relicensing of the Merced River Hydroelectric Project.

Respectfully submitted,



Chris Shutes
FERC Projects Director
California Sportfishing Protection Alliance
1608 Francisco St, Berkeley, CA 94703
blancapaloma@msn.com
(510) 421-2405



Chandra Ferrari

Chandra Ferrari
California Water Policy Director
Trout Unlimited
1808 B 5th Street
Berkeley, CA 94710
(916) 214-9731
(510) 528-7880 (fax)
cferrari@tu.org



Dave Steindorf

Dave Steindorf
California Stewardship Director
American Whitewater
4 Baroni Dr.
Chico, CA 95928
dave@amwhitewater.org



Ronald Stork
Senior Policy Staff
Friends of the River
1418 20th Street, Suite 100
Sacramento, CA 95811
(916) 442-3155 x 220
rstork@friendsoftheriver.org



Steve Rothert
Director, California Field Office
American Rivers
432 Broad St.
Nevada City, CA 95959
srothert@americanrivers.org



Cindy M. Charles

Cindy M. Charles
Conservation Chair
Golden West Women Flyfishers
1940 Sacramento Street #6
San Francisco, CA 94109
cindy@ccharles.net



Michael Martin

Michael Martin, Ph.D.
Director
Merced River Conservation Committee
PO Box 2216, Mariposa, CA 95338
(209) 966-6406
mmartin@sti.net



Gary Lasky

Gary Lasky
Conservation Chair
Sierra Club Tehipite Chapter
4677 N. Safford Ave.
Fresno, CA 93704
(559) 790-3495
data.nations@gmail.com

**BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

_____)	
Merced Irrigation District)	
Merced River Hydroelectric Project)	P-2179-043
_____)	

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Comments and Recommendations on the Ready for Environmental Analysis of California Sportfishing Protection Alliance, Trout Unlimited, American Rivers, American Whitewater, Merced River Conservation Committee, Friends of the River, Golden West Women Flyfishers and the Sierra Club in the above-captioned proceeding has this day been filed online with the Federal Energy Regulatory Commission and served via email or surface mail upon each person designated on the Service List compiled by the Commission Secretary for this Project.

Dated at Bend, OR this 22nd day of July, 2014.



Megan Hooker
American Whitewater
Associate Stewardship Director
503-928-7711
megan@americanwhitewater.org