

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

Modesto and Turlock Irrigation Districts)	
Don Pedro Project)	P-2299-075
)	

**CONSERVATION GROUPS’ COMMENTS ON DRAFT LICENSE APPLICATION
AND UPDATED STUDY REPORT**

Pursuant to 18 C.F.R. § 5.16(e), American Rivers, American Whitewater, California Sportfishing Protection Alliance, California Trout, Inc., Central Sierra Environmental Resource Center, Friends of the River, Golden West Women Flyfishers, Northern California Council Federation of Fly Fishers, Trout Unlimited, Tuolumne River Trust, (collectively, Conservation Groups) provide these comments on Modesto and Turlock Irrigation Districts’ (collectively, Districts) Draft License Application (DLA), eLibrary no. 20131126-5015 (Nov. 26, 2013) for the relicensing of the Don Pedro Project (P-2299). Pursuant to 18 C.F.R. § 5.15(f) we also provide comments on the Districts’ Updated Study Report (USR), eLibrary no. 20140106-5091 (Jan. 6, 2014).

The Districts have elected to file a DLA rather than a preliminary licensing proposal as permitted under Rule 5.16(c). Under the same rule, a DLA should include the contents of a license application as specified in 18 C.F.R. § 5.18. However, the Districts do not include any proposed changes to current operations or Protection, Mitigation, and Enhancement (PM&E) measures. DLA at Ex. B, p. 2-39, Ex. E, p. 2-7. Instead, the Districts

intend that the DLA describes the base line conditions for, and the effects of, current Project operations under the premise that a thorough evaluation of the Project effects under the Base Case are necessary before resource protection and enhancement measures can be proposed The Districts are evaluating alternatives and may include measures in the FLA.

DLA at Ex. E, p. 3-200. The Districts leave open the possibility that the FLA will propose operational changes.

We disagree with the Districts’ omission of PM&Es from the DLA. We recommend PM&E measures the Districts should consider in preparing the FLA,¹ but focus our comments on whether there is adequate information in the DLA and USR to support findings regarding the

¹ Under 18 C.F.R. § 5.18(b)(5)(ii)(C), the Districts “must provide, by resource area, any proposed new environmental measures, including, but not limited to, changes in the project design or operations, to address the environmental effects identified above and its basis for proposing the measures.”

extent and significance of project effects on beneficial uses. For example, the Conservation Groups dispute whether the Districts' findings regarding project effects on fall-run Chinook salmon and *O. mykiss* in both its anadromous (steelhead) and resident (rainbow trout) life-histories are supported by evidence in the record.

Pursuant to 18 C.F.R. § 5.15(f), we also request that the Districts provide, or that the Office of Energy Project (OEP) directs the Districts to provide, additional information² prior to filing the FLA so that the application provides an adequate basis for OEP's environmental analysis (*see* 18 C.F.R. § 380.3) and development and study of alternatives. There is good cause for the additional information requests. As stated above, the Districts' DLA and USR Meeting Summary make findings that we dispute. For example, the Districts find that the existing minimum flow schedule encourages a resident rather than anadromous life history for *O. mykiss*. If the Districts propose to develop an instream flow schedule based in part on this finding, they must first show that it is supported by reliable scientific evidence in the record. As the applicants, the Districts have the burden of proof in showing that their licensing proposal is in the public interest. 5 U.S.C. § 556(d); *see also* 16 U.S.C. 808(a)(2).³

Our comments are organized as follows. Section I addresses project effects on specific resources and recommends information and/or PM&E measures the Districts should consider in the FLA and/or supplements to the various updated study reports. Section II addresses the project's cumulative effects in relation to non-project actions within the Tuolumne River basin. Section III addresses the Districts' analysis of the project's consistency with comprehensive plans. Section IV summarizes our recommendations.

I. Additional Information is Needed to Evaluate Project Effects on Beneficial Uses of the Tuolumne River.

Federal Power Act (FPA) section 10(a)(1), 16 U.S.C. § 803(a)(1), requires that the project as licensed be, in the Commission's judgment,

best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in section 797(e) of this title . . .

² Consistent with OEP's guidance, additional information "is information that is readily available and that can be provided to help clarify the proposal." OEP, "A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria" (Mar. 2012), available at <http://www.ferc.gov/industries/hydropower/gen-info/guidelines/guide-study-criteria.pdf>. We do not believe that providing the additional information will require additional field work beyond that which is already needed to comply with the approved study plan.

³ The Districts held their USR meeting on January 16, 2014, and filed their Summary of this meeting on January 27, 2014. *See* eLibrary 20140127-5182 (Jan. 27, 2014) ("USR Meeting Summary").

Based on our review of the DLA and USR, the Districts have not provided adequate information on which the Commission can base a finding that the project is best adapted to a comprehensive plan of development. We understand that this is only the draft license application. However, there are significant data gaps and not much time remaining before the Districts must file their final license application. OEP should direct the Districts to provide additional information and specific explanation regarding their findings of project effects prior to accepting the FLA and issuing the Notice of Readiness for Environmental Analysis (NREA).

A. The Districts Should Propose Modifications to the Technical Advisory Committee Process Protocols to Make it an Effective Forum for Resolving Technical Disputes.

The DLA rightly states, “[t]he Don Pedro Project and its potential environmental effects have undergone continuous study and evaluation since the Project’s initial license was issued.” DLA at Ex. E, p. 1-13.

Disputes regarding the necessity, process, and substance of studies have likewise been continuous since the original license issued. This fact is not clear based on the DLA’s description of the Tuolumne River Technical Advisory Committee (TAC), which was initiated in the 1990s. For the past decade the TAC has not served as an effective forum to resolve technical disputes. *See* Conservation Groups, “Motion to Intervene and Comments on 10-Year Study Report,” eLibrary no. 20050725-5060 (July 25, 2005) (“Motion to Intervene”), ¶¶ 30-32 (stating the need for objective facilitation and other procedural reforms).

We believe relicensing presents an opportunity to restore the TAC. This is based on our positive experience in working with the Districts and their consultants and other resource agencies in developing, implementing, and evaluating relicensing studies. With the reforms we previously recommended, we believe that the TAC would be effective in helping the Districts manage fishery and recreation protections under the new license.

Recommendation: The FLA should include a measure to continue the TAC, subject to the development of process protocols and definition of roles and responsibilities in consultation with interested agencies and NGOs. The TAC should provide membership for the Conservation Groups.

B. Additional Information is Needed to Evaluate and Mitigate Project Effects on Groundwater Storage.

The DLA describes “drought hydrology,” stating that “[s]uccessive dry years are challenging for water managers” because demand goes up when supply is scarce. DLA at Ex. E, p 3-30. It describes the use of groundwater during drought years. *Id.* It also states that greater irrigation in wet years serves to recharge the groundwater basin. *Id.* However, “[r]ecent studies have indicated that groundwater storage has been reduced and may no longer be in a state of equilibrium as had existed in the 1990s (TID 2008).” *Id.*

This description suggests that there is a baseline condition of groundwater overdraft in the Turlock sub-basin. It also refers to the Turlock Irrigation District (TID) Groundwater Management Plan (2008), which states that groundwater recharge in the sub-basin is almost entirely a by-product of irrigation, rather than through natural recharge or through engineered recharge facilities.

Recommendation: More information is needed to understand project effects on groundwater hydrology. The FLA should provide updated groundwater data that includes 2008 to present. It should use existing information to quantify the extent of groundwater overdraft, including any variations by location. If the FLA finds instream flow improvements at the project may reduce groundwater recharge, it should evaluate measures to mitigate that impact. Such measures may include construction of recharge facilities, reduction of groundwater pumping within the Districts, and management of out-of-District groundwater pumping.

C. Additional Information is Needed to Evaluate and Mitigate Project Effects on Fall-run Chinook Salmon.

1. Salmon Studies Needed to Develop PM&Es are Incomplete.

The DLA states that studies were conducted in 2012 “to better understand Chinook salmon populations in the lower Tuolumne River and assess potential cumulative effects to the species resulting from activities inside and outside the basin.” DLA at Ex. E, p. 3-80. However, a number of studies necessary to understand the project’s effects on fall-run Chinook salmon are outstanding. Several of these⁴ are not scheduled to be completed until after the FLA is filed:

- Chinook Salmon Otolith Study (W&AR-11) (scheduled for completion in summer 2014);
- Temperature Criteria Assessment (W&AR-14) (scheduled for completion in 2014);⁵
- Supplement to the PHABSIM Instream Flow Study addressing (1) effective WUA by salmonid life stage, and (2) an evaluation of bass habitat (scheduled for completion in June, 2014); and
- Lower Tuolumne Floodplain Hydraulic Assessment (scheduled for completion in 2014).⁶

⁴ On February 14, 2014, the Districts also requested a one-year extension of the 2014 Predation Study Plan. See eLibrary no. 20140214-5167. If OEP grants the extension, the study will not be complete until March 2016.

⁵ The temperature criteria assessment will include: literature review of available temperature tolerances of Chinook salmon, desktop study on the influence of temperature on growth of Chinook salmon in the Tuolumne River, and desktop study on the influence of temperature on timing of initial spawning of Chinook salmon in the Tuolumne River. DLA at Ex. E, p. 3-80.

⁶ The Floodplain Hydraulic Assessment will include: (1) “[a] hydraulic analysis of the amount of floodplain inundated between RM 52.5 and 21.5 of the lower river at flows between 1,100 and 3,100 cfs, 3,100 and 5,300 cfs, and 5,300 and 8,400 cfs to supplement the USFWS (2008) assessment of floodplain inundation . . . ;” and (2) “[a]n evaluation of the floodplain inundation frequency and period at a range of flows that reflect alternative future Project operating conditions that can be compared to baseline conditions.” *Id.*

The DLA does not explain how the Districts can develop and support PM&Es in the FLA without the benefit of these study results.

Recommendation: The Districts should clarify how they intend to reconcile the current study schedule with their commitment to include PM&Es in the FLA due in April, 2014. OEP should not accept the FLA as final or issue the NREA until such studies are complete.

We also make the following specific recommendations for completion of certain studies:

1. The Temperature Criteria Assessment Study, which is being conducted by the Districts on their own motion, should include an analysis of temperature preferences and tolerances of largemouth, smallmouth, stripers, and pikeminnow.
2. The Effective WUA evaluation in the Instream Flow Study should use the analysis of these predators' temperature preferences to develop Effective WUA for these fish, in order to improve evaluation of how different flows affect the presence of fish that consume juvenile salmon and *O. mykiss*.

2. **Additional Information Is Needed to Support the DLA's Finding that Project Effects on Spawning Habitat Are Limiting Potential Increases in the Population of Tuolumne River Salmon.**

The general trend of escapement of Tuolumne River salmon has declined dramatically since original license issued in 1964. Although cyclical, there also has been a downward trend for the last ten years. The Districts attribute the decline to out-of-basin factors. DLA at Ex. E, pp. 3-4 – 3-5, 3-89 – 3-90. However, the data in the DLA and USR indicate that project effects on spawning habitat are also limiting escapement.

First, the project appears to limit flows suitable for spawning. The DLA suggests that 200-400 cfs is the optimal range for salmon spawning. *Id.* at 3-86, Table 3.5-10. According to the Lower Tuolumne River Instream Flow Study final report (April 2013) (W&AR-20) (*id.* at Attachment B), existing flows for dry years during the Chinook spawning period are not optimal:

- WUA for Chinook spawning at 150 cfs – the existing flow requirement for October 16-May 31 in the four driest water year types – is only 70% of maximum; and
- WUA for Chinook spawning at 175 to 180 cfs – the flows required for the next driest water year type – is only 80% of maximum.

Id. at Attachment B, p. 46.

Second, the project affects the availability of suitable spawning gravel. The DLA indicates that gravel quality of potential existing spawning habitat for Chinook is “poor in riffles,” and states that since 2001 only 4 out of 10 gravel augmentation projects recommended

by the TAC have been undertaken to improve the quality of spawning gravel in the lower Tuolumne River. DLA at Ex. E, pp. 3-83, 3-100.

By contrast, the USR finds that gravel of the correct size for salmon spawning is abundant in the channel of the lower Tuolumne River from La Grange Dam to about RM 22. *See Spawning Gravel in the Lower Tuolumne River Study Report (W&AR-04)*, p. 5-16, Table 5.5-1. At the USR meeting the Districts' consultant stated that, while there is plenty of gravel in the streambed of the lower Tuolumne River, spawning habitat would become a limiting factor "if populations were to be very substantially increased." USR Meeting Summary, p. 15. However, the USR does not show that all of the gravel is accessible for spawners. If there are limitations in the availability of much of this gravel for actual use, the study should explain both the current nature of the limitations and potential actions to increase availability.

Third, the USR indicates that blockage of fish passage by La Grange Dam⁷ may be limiting access to upstream spawning habitat preferred by fall-run Chinook. Even at low escapement fall-run Chinook preferentially spawn upstream of RM 47/48. *Id.* The USR Powerpoint presentation of the Redd Mapping Study Report (W&AR-08) shows a redd superimposition rate of 15.2%, and that 21.6% of salmon redds were located in gravel augmentation sites. *See USR Meeting Summary at Attachment C, Salmonid Redd Mapping Slide 7.*

Recommendation: The FLA should clarify the Districts' findings regarding project effects on spawning habitat and their significance.

The FLA should consider a PM&E measure that would raise the minimum flow during the Chinook spawning period (October 16 – January 31) to 300 cfs in all water year types, based on the Instream Flow and Redd Mapping study results.

The Districts should clarify whether the amount of suitable, accessible gravel is different from the gross quantity of gravel in the lower river. If there is a difference, the Districts should explain how they calculated the difference and whether there are measures that could increase the availability of suitable gravel. For example, a starting point for such measures might be completion of the channel restoration and sediment management projects recommended by the TAC, or alternative projects that are identified in collaboration with resource agencies and Conservation Groups.

⁷ FERC has ordered the Districts to file an application for original license or exemption for La Grange by June 19, 2016. *See Turlock and Modesto Irrigation Districts*, 141 FERC ¶ 62,211 (2012) (ordering licensing) and eLibrary no. 20130627-3037 (June 27, 2013) (extending deadlines by six months). On January 29, 2014, the Districts commenced the licensing by filing a Pre-Application Document. *See* eLibrary no. 20140129-5254 (Jan. 29, 2014). The Commission has assigned the La Grange Project docket number P-14581.

3. **Additional Information Is Needed to Support the Districts' Finding that Project Effects on Rearing Habitat Are Not Limiting the Success of Outmigration.**

The DLA and USR show that the project impacts rearing habitat, but the Districts argue that rearing habitat is not a limiting factor on salmon.

The DLA describes the juvenile life history of Chinook in the lower Tuolumne River:

Chinook salmon rearing in the Tuolumne River primarily occurs from January to May Low numbers of over-summering juveniles have been found downstream of the La Grange gage . . . during routine snorkel surveys in most years Based on seine and rotary screw trap monitoring, juvenile Chinook salmon out-migrate from the lower Tuolumne River into the San Joaquin River and Delta as fry (<50 mm) as early as February in years with high flows, with smolts (>70 mm) emigrating during April and May in most years

DLA at Ex. E, p. 3-86.

The DLA states that increased flows could improve out-migrant survival of juvenile Chinook in April and May:

Results of rotary screw trap monitoring and Delta out-migrant tracking and survival studies generally support the utility of increased spring pulse flows during April-May as a means of improving out-migrant survival from tributaries to the San Joaquin River Delta (Stillwater Sciences 2012a), if timed correctly. Based on rotary screw trap monitoring data from the Waterford (RM 29.8) and Grayson (RM 5.2) locations, Robichaud and English (2013) suggested that, on average, 35 percent of Chinook smolts moved during the first day of increased flows, and 66 percent moved within the first three days.

DLA at Ex. E, p. 3-89.

The DLA does not address whether increased flows in February and March would improve out-migrant success for juvenile Chinook that leave the river as fry, or whether higher flows or pulse flows in February and March would offer similar benefits. The DLA does not explain the basis for these omissions. The Districts do not account for the value of relatively cool water temperatures in stimulating smoltification and maintaining thermally suitable water temperatures in the lower river in April and May during outmigration of juvenile Chinook, particularly in the lower end of the river near San Joaquin confluence.

The DLA reports that increased floodplain inundation would increase rearing habitat:

Results of the Pulse Flow Study (Stillwater Sciences 2012a) show that flows above bankfull discharge at the locations studied were associated with increases in overbank habitat area suitable for juvenile life stages of Tuolumne River salmonids. Suitable habitat areas for juvenile salmonid life stages increased most rapidly between bankfull

discharges of 1,000 and 3,000 cfs, corresponding to floodplain inundation. The increase in suitable habitat areas was less rapid at nearly all sites from 3,000 to 5,000 cfs. Extensive floodplain habitat does not occur at downstream locations due to higher flow thresholds required for floodplain inundation.

DLA at Ex. E, p. 3-89.

However, the DLA suggests that changes to flow or other operations are not necessary because rearing habitat is not a limiting factor for salmon:

Consistent with increases in juvenile rearing density and smolt production found in monitoring data for years following higher escapement, [Salmon Population] model simulations indicate that Chinook salmon fry and juvenile rearing habitat is not limiting smolt productivity under current conditions.

DLA at Ex. E, p. 3-92.

The Conservation Groups disputed this conclusion in comments on the Salmonid Synthesis Study (W&AR-05). We highlighted the Districts' finding as contrary to scientific evidence submitted by the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS):

The Anadromous Fish Restoration Program (2005) recommended high spring flows to improve migration out of the river and through the San Joaquin. Mesick and Marston (2007) (Limiting Factors Analysis) highlighted the lack of high spring flows, and suggested that lack of floodplain inundation in the Tuolumne River and high flows limited food production and juvenile rearing habitat. Mesick (2010) recommended high spring flows to maintain low water temperatures in the river and to improve outmigration success.

Conservation Groups, "Comments on Initial Study Report," eLibrary no. 20130311-5169 (Mar. 11, 2013), pp. 3-4 ("ISR Comments").

We continue to object to the Districts' rejection of this evidence based on the Districts' presumption "that a habitat limitation would likely lead to either reduced upstream densities or early fry dispersal in non-flood years," which has not occurred. *Id.* The DLA does not provide evidence in support of the Districts' presumption, or otherwise address this objection.

We also continue to have concerns about the accuracy of the Tuolumne River Chinook Salmon Population Model (W&AR-06), as we expressed in our ISR comments. *See id.*, p. 4. The model's presumption that juvenile rearing habitat is not limiting for Chinook, in favor of the theory that predation is the primary cause of low out-migrant success, biases the model and potential outcomes against actions to improve juvenile habitat.

Recommendation: The FLA should consider flow increases to improve juvenile rearing habitat. Such flow improvements could include flows to improve juvenile rearing in-channel and

to improve the regularity, frequency, and duration of floodplain inundation. The FLA should consider flow pulses in February and March to stimulate downstream migration of juvenile Chinook in the fry and parr life stages to diversify the life history strategies of Tuolumne River Chinook. The FLA should consider flow pulses in April and May in order to stimulate outmigration of Chinook in the smolt stage. For all flow pulses, the FLA should consider both long pulses (or simply higher base flows) and short term pulses to stimulate short-term outmigration events.

The FLA should consider post-licensing implementation of a Chinook Salmon Outmigration Study, similar to the studies proposed by the Districts, USFWS, and Conservation Groups for inclusion in the first and second years of the Study Plan but not adopted by OEP. The study is appropriate because there is inadequate understanding of short-term or long-term flow management actions that may induce downstream migration.⁸

In addition, the FLA should consider measures that would complete the channel restoration projects that were previously recommended by the TAC, or alternative projects that are identified in collaboration with resource agencies and Conservation Groups.

4. The DLA Does Not Contain Adequate Information to Support a Finding that Predation is a Limiting Factor that Can Be Successfully Addressed with Non-Flow Measures.

As stated above, the DLA acknowledges the low success of juvenile Chinook outmigrants from lower Tuolumne River. The DLA indicates that changes in project operations, e.g., changes in flow schedule to increase spawning and rearing habitat, could increase success. However, the majority of the DLA's analysis focuses on predation, principally by "non-native piscivores," as the primary cause of low juvenile survival rates. DLA at Ex. E, pp. 3-87 – 3-88.

Conservation Groups agree that many rearing and outmigrating juvenile salmon are eaten by other fish. The project has created or contributed to conditions that favor predators, which tend to be habitat generalists, over native fish such as salmon. However, it is not simply a matter of removing predators directly; the new license should also mitigate the project's effects on salmonid and predator habitat.

The Districts argue that predation has become the primary limiting factor affecting salmon in large part due to CDFW's introduction of non-native, highly efficient salmon predators (smallmouth bass, largemouth bass and striped bass) to the Tuolumne River and Bay Delta ecosystem. *See, e.g.*, DLA at Ex. E, Table 3.5-8. They view predation as "an issue by itself" and recommend "other proven, economical, non-flow methods" to reduce predators rather than increases in flow to improve salmonid habitat:

⁸ "To the extent, if any, that it is not possible to explore and address all cumulative impacts at relicensing, the Commission will reserve authority to examine and address such impacts after the new license has been issued, but will define that reserved authority as narrowly and with as much specificity as possible, particularly with respect to the purpose of reserving that authority." 18 C.F.R. § 2.23.

Thus, increasing flows to address predation simply because it may “possibly” help the situation does nothing more than attempt to alleviate the symptoms rather than truly address the actual problem. Predation is an issue by itself and needs to be treated as such. Even assuming that increased flows would have a positive impact in reducing predation, the application of more water is far too costly a method to employ, and, as the DFG is responsible for introducing these piscivorous non-native species, the DFG should be responsible for eradicating them.

Letter from Tim O’Laughlin, San Joaquin River Group Authority to Charlie Hoppin, SWRCB (Feb. 8, 2011), p. 2, *available at* http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_sprrinfo/02082011sjrga.pdf.

The Districts have not yet proposed specific “proven, economical, non-flow methods” to improve juvenile outmigration by reducing predation. It is impossible to evaluate the effectiveness and compare the costs and benefits of alternatives that are not on the table.

The DLA rightly identifies operation of Delta export pumps as creating a predation gauntlet (DLA at Ex. E, pp. 3-89 – 3-90). However, it does not properly identify or evaluate the project operations which create hazardous conditions in the lower Tuolumne River. Under the current license, required flow during the months of Chinook outmigration is 150 cfs in just over 30% of all water years, 175 or 180 cfs in just less than 20% of years, and maxes out at 300 cfs in all other water years. “Flood flows” provide the only flow variability and relief from the narrow wetted perimeter under the minimum flow schedule. The now abandoned Vernalis Adaptive Management Program (VAMP) flows provided some flow (and thus habitat) improvement in the past, but only from mid-April to mid-May.⁹

By comparison, the limited sampling the Districts did in their first year of the Predation Study found that outmigration was more rapid and more successful at 2100 cfs than it was at 415 cfs or 280 cfs (Predation Study Report (W&AR-07), p. 5-23).

The DLA acknowledges that floodplain inundation may reduce interaction between predatory fish and juvenile salmon. DLA at Ex. E, p. 3-89. However, it states that fish stranding may diminish some of that benefit. *Id.* It does not cite to any evidentiary basis for this stranding hypothesis.

The gaps in the Districts’ analysis regarding the significance of predation relative to poor habitat conditions are demonstrated in the DLA’s discussion of the relationship between juvenile mortality and water temperature. The Chinook Salmon Population Model Study Report (W&AR-06) states that the Districts used lethal temperature values in their Chinook population model as the threshold for determining whether water temperatures cause mortality of various juvenile life stages (fry, “juvenile,” and smolts). *See* Tuolumne River Chinook Salmon Population Model Report (W&AR-06), pp. 4-12, 4-16, 4-20 – 21. The model is limited in that it

⁹ Substantially more VAMP water was released from the Merced River than was released from the Tuolumne River, despite the fact that the Tuolumne has double the average annual runoff of the Merced.

does not identify lower temperature values that would weaken or stress these juveniles prior to or during outmigration. Such effects have been noted in numerous studies, including Brett (1956): “[w]ithin a population, the inability to maintain near optimum growth at less than optimum temperatures is as decisive to continued survival as more extreme temperatures are to immediate life.” Nevertheless, the DLA relies on the model results to claim that water temperature is not limiting to smolts because most outmigration takes place before the water gets too hot to cause direct mortality:

because monitoring data as well as model results indicate the majority of annual smolt emigration occurs early in the spring at lower water temperatures, model sensitivity testing results indicate that water temperature is not limiting smolt productivity under current conditions.

DLA at Ex. E, p. 3-92. Given that non-lethal temperatures stress juveniles, the more reasonable interpretation of the data is that the temporal window for successful outmigration is shortened as water temperatures enter the sublethal range, and that more flow and lower water temperatures in the later spring would extend the annual time period during which smolts successfully outmigrate.

In analyzing proposals to reduce the population of striped bass in the Delta, Dr. William Bennett and Dr. Peter Moyle of the U.C. Davis Center for Watershed Sciences noted: “apparent high predation rates may be the result of . . . management practices that create bass feeding stations.” *See* <http://californiawaterblog.com/2011/01/31/striped-bass-control-the-cure-worse-than-the-disease/>. Bennett and Moyle further noted the perils of removing the dominant predator, which may also prey on other predators. *Id.* The DLA does not evaluate the potential pitfalls of relying on direct predator reduction.

The DLA does not explain why predator reduction should be the preferred method of increasing out-migrant success despite evidence that certain predators, including striped bass, are at very low population levels in the Bay-Delta system.¹⁰

In summary, the DLA’s contention that “predation is an issue in itself” oversimplifies the limiting factors affecting salmon. Its focus on this issue also prevents understanding of the project’s role in the low success of juvenile survival and outmigration from the Tuolumne River.

Recommendation: The FLA should propose numeric objectives for successful outmigration of juvenile Chinook from the Tuolumne River, including percent and size of various lifestages leaving the river. The Districts should develop a suite of PM&E measures to

¹⁰ FISHBIO, consultants to the Districts, reported that six fish species documented since 1967 – striped bass, American shad, threadfin shad, delta smelt, longfin smelt, and Sacramento splittail – “exhibited low abundance in 2013, and many show continued declining abundance trends.” *See* FISHBIO, “Fish numbers in San Francisco Bay Delta remain low,” available at http://fishbio.com/?utm_source=Fish+Report%3A+Fish+Numbers+in+San+Francisco+Bay+Delta+Remain+Low&utm_campaign=Fish+Report%3A+Fish+Numbers+in+San+Francisco+Bay+Delta+Remain+Low&utm_medium=email.

achieve these objectives, including improved flows, pulse flows, and physical habitat improvements. If the Districts wish to propose predator suppression or relocation measures, these measures should work in concert with flow and other measures and should avoid collateral damage to other aspects of the aquatic ecosystem.

5. The DLA Does Not Include Adequate Information to Evaluate In-River and In-Delta Measures.

The DLA analyzes the interaction of facilities, operations, and predation in the Delta that limit successful out-migration:

Predation in the lower San Joaquin River Delta and predation related mortality within the Clifton Court forebay of the State Water Project (SWP) and Central Valley Project (CVP) water export facilities affect the numbers of Chinook salmon recruited to the ocean fishery (TID/MID 2013b). For Chinook salmon out-migrants from the Tuolumne River, increased flows at Vernalis have been shown to reduce predation-related mortality, but the relationship is highly dependent on the presence of the Head of Old River Barrier. Salvage losses of Chinook entrained into the SWP and CVP export facilities increase with increasing export flows, and pre-screen losses of 63–99 percent have been estimated for fish entrained into the Clifton Court forebay. For juvenile Chinook salmon not entrained by the SWP and CVP export facilities, non-native fish introductions, levee construction, and changes in flow magnitudes and timing have increased predator ranges. In addition, water temperature related mortality during late spring explains much of the variation observed during past smolt survival studies in the Delta (TID/MID 2013b).

DLA at Ex. E, pp. 3-89 – 3-90

The percent of freshwater survival is equal to the percent of in-river survival times the percent of Delta survival.¹¹ The current condition of low survival in both environments leaves overall freshwater survival of juvenile salmon extremely low.

The Districts must provide evidence that their proposal will be best adapted to a comprehensive plan for developing or improving all beneficial uses of the Tuolumne River. The Commission has identified anadromous fish as an important beneficial use of this waterway. We do not believe that a licensing proposal by the Districts that does not include measures to improve both in-river and in-Delta conditions for anadromous fish can meet the best adapted standard under Section 10(a)(1).

The project has impacts on in-Delta survival of juvenile Chinook in addition to in-river survival. Of the three major San Joaquin River tributaries, the Tuolumne has the largest annual runoff and the most storage. The DLA acknowledges that “predation-related mortality” is reduced with increased flow at Vernalis. *Id.* The Districts, however, overstate the conditionality of the benefits of flow improvements in the San Joaquin on the Head of Old River Barrier

¹¹ The Chinook Salmon Otolith Study (W&AR-11), due to be completed in summer 2014, will provide some data on residence and migration time of juvenile Tuolumne River Chinook salmon in and through the Delta.

(HORB). HORB is ineffective at flows greater than about 7000 cfs at Vernalis; yet as flows increase at volumes greater than 7000 cfs, outmigration success of juvenile salmon also increases.¹² Further, the installation of HORB is seasonal, and the barrier is generally fully functional only from mid-April through mid-May. As was generally the case with VAMP, HORB helps to protect the smolt lifestage of outmigrating Chinook, but does nothing to protect outmigration of fry or parr before mid-April. While HORB does help in some circumstances, a more permanent engineered barrier or screen could improve on HORB's effectiveness.

Recommendation: The FLA should consider alternatives in which various in-Delta measures are combined with in-river PM&E measures. In-Delta measures should include augmented flow from the Tuolumne River, from the other tributaries, and from the mainstem San Joaquin in various combinations of volume and timing. They should include an engineered fish protection structure at the head of Old River, and potentially at other points downstream on the San Joaquin. They should include different spring operations scenarios for the Delta export facilities.

D. The DLA and Supporting Documents Do Not Accurately Characterize the Overall Condition of *O. Mykiss* in the Lower Tuolumne River.

The DLA states two main characteristics of the lower Tuolumne River *O. mykiss* population: "... it is apparent that increased summer flows since 1996 have resulted in large increases in resident fish, but no evidence of a steelhead run (TID/MID 2013e)." DLA at Ex. E, p. 3-95.

The DLA's claim of "large increases in resident fish" is not supported by the study results. The *O. mykiss* Monitoring Report (*see* eLibrary no. 20110114-5124 (Jan. 14, 2011), p. 13, Fig. 4) shows there was relatively high abundance in 2006 during high flows, but almost no fish were found in surveys in dry years 2007 and 2008. This cycle is typical according to anglers who have fished the river over the past decade.¹³

In addition, the presence in the lower Tuolumne River of steelhead has been settled by the Commission. *See Turlock and Modesto Irrigation Districts*, 128 FERC ¶ 61,035 (Jul. 16, 2009), ¶¶ 60-61. The Commission found sufficient information "to support the conclusion that steelhead are present in the Tuolumne River." *Id.* (citing and discussing Zimmerman, *et al.*, "Maternal Origin and Migratory History of *Oncorhynchus mykiss* captured in rivers of the Central Valley, California" (Mar. 6, 2008)).

The DLA finds that (1) flows are adequate to support resident *O. mykiss*, and (2) oversummering conditions are so agreeable that they discourage the anadromous life history. In support, the DLA makes inappropriate comparisons between the Tuolumne and "other Central

¹² See, e.g., Bay Institute, et al., *Comments on Draft SED On Changes To Bay-Delta WQCP San Joaquin River Flows And Southern Delta Water Quality*, Analytical Appendix 1, p. 13, available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pdsed/docs/comments032913/jonathan_rosenfield.pdf.

¹³ Cindy Charles, Golden West Women Flyfishers, pers. comm. (Dec. 2013).

Valley Rivers.” DLA at Ex. E, p. 3-95. It does not show that the rivers are comparable for this purpose. For example, unlike the Sacramento River downstream of Keswick Dam and the Yuba River downstream of Englebright Dam, the Tuolumne River does not have a robust population of resident rainbow trout supported by high summer flows. According to Dr. Ronald Yoshiyama, consultant to the City and County of San Francisco, “[r]outine fish monitoring by the Districts indicates relatively low numbers of trout have been present over the past 1-2 decades—i.e., far below the numbers occurring in the Sacramento River mainstem and tributaries.” Dr. Ronald Yoshiyama, “Commentary on Evaluating the Temperature-Related Flow Requirements of Steelhead-Rainbow Trout (*Oncorhynchus Mykiss*) in the Lower Tuolumne River: A Literature Review and Synthesis,” eLibrary no. 20120807-5082 (July 5, 2012), p. 2 (“Yoshiyama Memo”).

Despite the suggestion that *O. mykiss* are more apt to exhibit the anadromous life history in response to stressful temperatures, the DLA does not explain why the lack of cold water releases in dry years did not lead to a population of anadromous *O. mykiss* in 2001, when average monthly June through September releases to the lower Tuolumne ranged from 54 to 112 cfs or in 2002, when average monthly June through September flows ranged from 68 to 97 cfs. See Salmonid Populations Information Integration and Synthesis Report (W&AR-05), p. 3-26, Table 3.4-8. Similarly, it does not explain why steelhead were not present prior to 1996, when the Districts were not required to release any flow for the benefit of *O. mykiss*.

Contrary to the DLA’s claims, the evidence in the record shows the current condition of *O. mykiss* in the lower Tuolumne River is one of a depauperate population of resident and anadromous *O. mykiss*, where at times the populations go very low. See Salmonid Populations Information Integration and Synthesis Report (W&AR-05), pp. 5-48 – 5-49 (snorkel survey results for *O. mykiss*). These results show population spikes in wet years 2006 and 2011 that are not sustained in subsequent years. In spite of claims of density dependence that crowds out juveniles from riffle-pool transitions (DLA at Ex. E, p. 3-96), juvenile and adult populations follow parallel annual trends. See *id.*

1. The DLA Documents Poor Conditions for *O. mykiss* In-River Rearing in the Lower Tuolumne River.

The DLA documents poor physical habitat for *O. mykiss*:

Because of its generally small size, location in the channel, and lack of complexity, most [large woody debris (LWD)] in the lower Tuolumne River is unlikely to provide significant cover and habitat for *O. mykiss* (TID/MID 2013g). In addition, the amount of instream shelter in the form of boulders, aquatic vegetation, small woody debris, and terrestrial vegetation is very low. During a 2012 survey, riffles, flat water, main channel pools, and scour pools had shelter ratings (on a scale of 0–300) of 10, 31, 49, and 40, respectively (TID/MID 2013g). Low levels of instream cover for juvenile *O. mykiss* result in greater exposure to predation. Cover provided by overhanging terrestrial vegetation and small woody debris accumulations in the mainstem may persist to a greater extent under the regulated flow regime than they would under more widely varying flows (TID/MID 2013g).

DLA at Ex. E, p. 3-97.

The absence of other structural features (e.g., boulders, large woody debris (LWD), characteristic of alluvial rivers of the Central Valley, is associated with reduced rearing densities for all age classes (TID/MID 2013g).

Id., p. 3-98.

The DLA also recognizes limitations created by high summer water temperatures: “The downstream extent of suitable water temperatures may limit habitat for age 0+ fish.” *Id.*

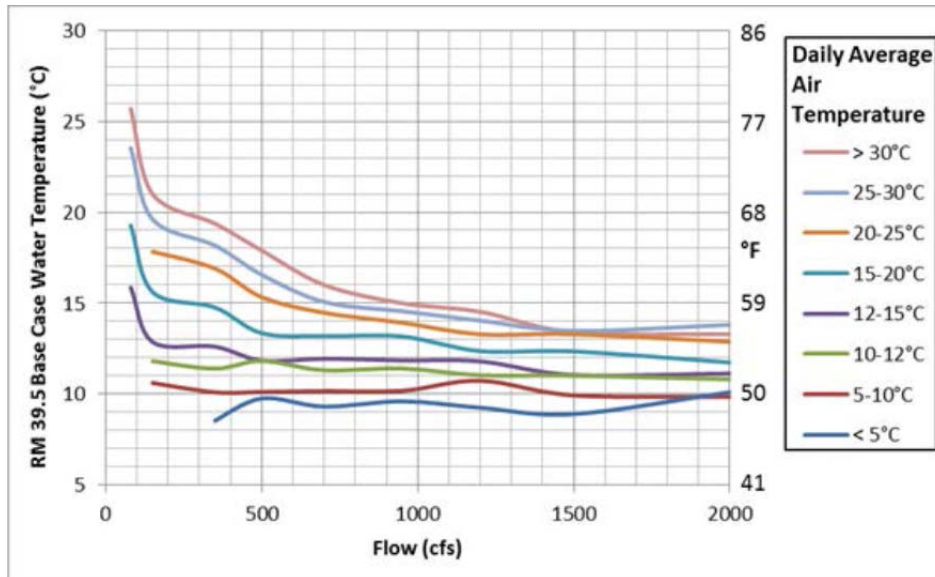
The Effective WUA calculations that will be included in the supplement to the Instream Flow Study will better quantify the loss of *O. mykiss* habitat to high summer water temperatures. Absent this data, we rely at present on the Yoshiyama Memo to quantify the thermally suitable oversummering habitat for *O. mykiss* in the lower Tuolumne at different flows:¹⁴

The analysis showed that sufficiently cool water (i.e., 65°F or lower) can be maintained in at least the uppermost 1.5 miles (from La Grange Dam to below Old La Grange Bridge) by 50 cfs flows throughout May-September (Stillwater Sciences memo, Figure 2a). At 75 cfs, roughly the same amount of cool-water refuge (65°F or less) is maintained during June-August as with 50 cfs flows, but the cool water extends a few miles further downstream during May and September (Figure 2b). Even flows of 150 cfs will provide no more than about 5-6 miles of cool water below La Grange Dam during most of June-August and somewhat less than 10 miles of cool water during the warmer halves of May and September (Figure 2c).

Yoshiyama Memo, p. 6.

¹⁴ Yoshiyama’s analysis uses the 2003 Stillwater temperature analysis for its data. *See* Districts, “Annual Article 58 Report for P-2299,” eLibrary no. 20040401-0268 (Mar. 31, 2004).

The DLA also shows a thermal benefit to oversummering *O. mykiss* with flows as low as 200 cfs:



DLA at Ex. E, p. 4-67, Fig. 4.3-7. This exceedence plot shows that average daily water temperatures at 200 cfs are almost always less than 20° C. at RM 39.5 (Roberts Ferry Bridge), and at 300 cfs are always less than 20° C. at RM 39.5.

The *O. mykiss* Population Model Study Report (W&AR-10), see Fig. 5.1-2, 5.1-3, 5.1-4, takes the numbers from 2008-2011 snorkel surveys (cited above) and uses them to calibrate the model. The snorkel surveys found very low numbers of *O. mykiss* in dry years 2008 and 2009, slightly higher numbers in average water year 2010, and an order of magnitude greater numbers observed in wet year 2011. However, the Population Model predicts only a quarter of the fish that were observed in wet year 2011.

Finally, the DLA reports clear benefits to inundation of floodplain habitat in the lower Tuolumne River, that the quantity of this habitat increases most rapidly between 1100 and 3000 cfs, and that these increases line up with improvements in suitable depth and velocity:

As noted above, results of the Pulse Flow Study (Stillwater Sciences 2012a) show that flows above bankfull discharge at the locations studied along the Tuolumne River were associated with increases in overbank habitat area suitable for life stages of salmonids. Although little information exists suggesting juvenile *O. mykiss* use floodplain habitats in the Central Valley (TID/MID 2013b), suitable habitat areas for juvenile *O. mykiss* life stages increased most rapidly between bankfull discharges of 1,000 and 3,000 cfs, corresponding to floodplain inundation.

DLA at Ex. E, p. 3-98.

2. The New License Must Protect All Life Stages of *O. Mykiss* in The Lower Tuolumne River.

The DLA states:

Results from the current IFIM study (Stillwater Sciences 2013) show that juvenile *O. mykiss* habitat is maximized in the 50–350 cfs range, and adult WUA is maximized in the 150–400 cfs range (Table 3.5-10). Prior PHABSIM modeling combined with water temperature suitability (Stillwater Sciences 2003) suggests that flows which maximize habitat for larger fish are generally higher, and may therefore limit juvenile habitat (TID/MID 2013b).

Id. at Ex. E, p. 3-98. As noted above, the DLA does not make management recommendations to benefit *O. mykiss* in the lower Tuolumne. The Districts acknowledge that current operation of the project, their default proposed action, limits thermally available habitat for both juvenile and adult *O. mykiss*, and limits availability of desired depth and velocity for adult *O. mykiss*.

However, the Yoshiyama Memo suggests that juveniles should be managed preferentially over adults:

Adult *O. mykiss* that occur in the Tuolumne River during summer and early fall are presumably resident rainbow trout and are not listed (protected). Hence, flow-related efforts to accommodate those adults should be subordinate to any flow measures needed to protect juvenile *O. mykiss*. Those juveniles may include individuals of the anadromous (steelhead) life-history type and, furthermore, represent the future spawning stock that potentially may produce anadromous individuals.

Yoshiyama Memo, pp. 4-5. We do not believe this is justified biologically, legally, or as policy. There is competing evidence in the record that recommends against such an approach.

In addition to Zimmerman's finding that the progeny of anadromous fish often adopt a resident life history, recent studies have shown that resident rainbow trout may also have anadromous progeny. *See, e.g.,* Courter, et al., 2013: *Resident Rainbow Trout Produce Anadromous Offspring in a Large Interior Watershed*. In addition, the distinction made between juveniles and adults in the Lower Tuolumne River Instream Flow Study (cutoff at 150 mm) is not necessarily indicative of the size at which a juvenile in the Tuolumne may smolt. Rotary screw traps in the Calaveras River reported by FISHBIO show outmigrant *O. mykiss* captured in 2013 ranging in size from 100-299 mm. *See e.g.* FISHBIO Report, March 1, 2013. The likelihood of survival increases with increased size of outmigrating steelhead. *O. Mykiss* Population Model Study Report (W&AR-10), pp. 6-7. A good case can be made that one should manage for these larger smolts. These are fish whose habitat preferences would be reflected in the WUA for the adult life stage.

The WUA for the adult life stage climbs steadily up to about 500 cfs, and is three times greater at 300 cfs than it is at 50 cfs. *See* Lower Tuolumne River Instream Flow Report (W&AR-10), p. 46, Fig. 22. The WUA for juvenile *O. mykiss* is about 93% of maximum at 300

cfs. Considering the thermal benefits of flows of 300 cfs to all life stages and the physical habitat benefits to adult *O. mykiss*, choosing a flow requirement of 150 cfs over 300 cfs to achieve a seven percent increase in modeled habitat for juveniles, based on a juveniles-first rationale, is not warranted.

The Districts have not yet released their Study Report for the Temperature Criteria Assessment (W&AR-14) that the Districts undertook on their own motion. In the interim, we do not believe that the thermal targets suggested by the Yoshiyama Memo are adequate:

Water temperatures of 64.5-68°F appear to represent an adequate target-range for practicable flow management in maintaining steelhead-rainbow trout (*O. mykiss*) during the warmer seasons. Those temperatures are not optimal, but they are not expected to be so highly stressful to the trout as to cause substantial mortalities and significantly impair population viability.

Yoshiyama Memo, p. 4.

If adopted as management criteria, these targets would maintain the current degraded condition of the lower Tuolumne *O. mykiss* fishery. In 2005, the Conservation Groups called for increased summer flows to support both resident and anadromous *O. mykiss*. See Motion to Intervene ¶¶ 44-49. The current constriction of thermally suitable summer habitat in the lower Tuolumne, down to one to four miles in half of all water years, will not allow the Tuolumne River to reach the critical mass sufficient to support a consistent *O. mykiss* fishery.

3. The Causes of an Anadromous Life-History of Tuolumne River *O. mykiss* are Not Well Understood.

As stated above, the DLA argues that existing in-river conditions favor a resident life history for *O. mykiss* over an anadromous life history. See, e.g., DLA at Ex. E, p. 3-95.

Others have suggested competing theories. The Yuba Accord Monitoring and Evaluation Interim Report (2013)¹⁵ suggests that even in-river conditions much better than those in the Tuolumne are not inhibiting adoption of an anadromous life history. This report suggests:

Previously, it has been surmised that perhaps the inclination towards *O. mykiss* residency rather than anadromy was associated with cold water temperature conditions provided in the river. However, research in the Central Valley does not necessarily support that presumption. For example, Satterthwaite et al. (2010) do not predict that a cool summer with high flow will strongly favor residency - rather, they conclude that the single most important factor in preserving the anadromous life history of *O. mykiss* is survival during the period between emigration to the ocean and returning to spawn.

¹⁵ We do not necessarily agree with the conclusion of the Yuba M&E Report that life history outside natal Central Valley rivers is more limiting of anadromous *O. mykiss* than in-river conditions; we offer it to emphasize that there is no scientific consensus on the conditions favoring or disfavoring anadromy in Central Valley *O. mykiss*.

Yuba River Management Team Interim Monitoring and Evaluation Report, p. 7-15, *available at* http://www.ycwa-relicensing.com/Technical%20Memoranda/TM%2007-08%20-%20ESA_CESA-Listed%20Salmonids%20Below%20Englebright%20Dam%20-%20FINAL%20POSTED%20042913/TM%207-8.pdf.

As we pointed out in our January 7, 2014 comments on the *O. mykiss* Population Study Workshop #2, isolating the effect of Don Pedro reservoir operations on steelhead only during their residence in the Tuolumne River is arbitrary because the fish and the water released from the reservoir experience the Tuolumne, San Joaquin, and freshwater Delta as a river continuum. Stopping the analysis of Tuolumne River reservoir operational impacts on steelhead at the confluence with the San Joaquin denies the physical reality of this continuum and may result in management that “solves” problems in the Tuolumne while exacerbating actual population bottlenecks that result from Tuolumne River operations and manifest downstream. Most if not all of the issues that confront Chinook outmigrants passing through the Delta also at least potentially confront steelhead outmigrants. *See* DLA at Ex. E, pp. 3-89 – 3-90, as quoted above. This is particularly critical in weighing modeled physical habitat against the benefits of increasing flow to reduce duration of outmigration and/or to help maintain adequate water temperatures.

The Yoshiyama Memo offers an additional hypothesis, which we support, regarding the importance of low temperatures in the spring in promoting adoption of an anadromous life history:

An important point indicated from the literature reviews summarized below is that steelhead that are undergoing smoltification definitely require cooler temperatures—i.e., ~54°F (12°C) or lower—compared with the water temperatures they can tolerate during the preceding freshwater rearing period. Failure to provide necessary cool conditions during this sensitive period will impair the smoltification process and may cause direct mortality, disruption of physiological and behavioral adaptations leading to reduced marine survival, and other negative consequences.

Yoshiyama Memo, p. 5. This apparent need can be addressed by requiring high flows to maintain cold water temperatures for as long as possible into the outmigration season (the DLA states that peak is March through May).

Finally, we note that an unusual event on the Merced River in 2012 may provide insight into what stimulates downstream migration of *O. mykiss* in the spring. A small storm apparently combined with in-river work on an agricultural diversion caused an unprecedented number of *O. mykiss* to be collected in a rotary screw-trap at Hopeton (Merced River Mile 37.5).¹⁶ Since there is a very small existing dataset for anadromous *O. mykiss* in the Tuolumne River, it may be

¹⁶ “The majority of *O. mykiss* were caught during a substantial storm event during Week 15 (April 13-15, 2012), when 319 *O. mykiss* were captured (310 at Hopeton and 9 at Stevinson) within a 36-hour period.” Merced Irrigation District, *2012 Annual Report: Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River*, p. ES-1.

necessary to rely on data from such events, including events on other rivers, to gain understanding into life history strategies.

Recommendations: The FLA should include measures to stabilize and increase the *O. mykiss* population in the lower Tuolumne River. Whether this may reduce the likelihood of anadromy is a second order question. Low flows prior to 1996 certainly did not increase the steelhead population. *O. mykiss* juveniles that survive oversummering in the Tuolumne River are 100% more likely to adopt an anadromous life history than *O. mykiss* juveniles that do not survive oversummering.

The data reported in the DLA indicate that oversummering conditions are the primary limiting factor for *O. mykiss* in the lower Tuolumne River. The FLA should evaluate increasing summer flows to 300 cfs in all years. The water cost of increased summer flow could be mitigated in significant part by completion of the Infiltration Galley/Turlock Area Drinking Water Project at Geer Road (River Mile 26).

The DLA also describes physical habitat conditions that require improvement, including lack of large wood and other forms of cover and lack of channel complexity. *O. mykiss* use the areas where gravel has been added and where channel structure has been improved. The FLA should propose measures to improve the physical habitat conditions in each of these categories.

E. Additional Information is Needed to Evaluate and Mitigate Project Effects on Whitewater Recreation.

According to the DLA, a thorough evaluation of project effects on current operations is necessary before PM&E measures can be proposed. The DLA does not specifically propose any PM&E measures for enhancing recreation at the project, but the FLA may. DLA at Ex. E, p. 3-200.

The DLA acknowledges that the project has unavoidable adverse effects on whitewater recreation. *Id.* It states that these unavoidable effects are offset by the benefits to whitewater recreation upstream of the project. *Id.*

In determining the terms on which to issue the new license, the Commission should seek to harmonize otherwise competing uses of the waterway. *Namekagon Hydro Co.*, 12 FPC 205, 206-07 (July 30, 1953). We believe that there are measures that could enhance whitewater recreation without adversely affecting flatwater recreation or other beneficial uses of the project. We request that the FLA include additional information in order to develop and evaluate such measures pursuant to the Commission's policy to seek "the ultimate development of these [recreational] resources, consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project." 18 C.F.R. § 2.7.

1. The DLA Does Not Estimate Future Demand for Whitewater Recreation.

The DLA does not forecast future demand for whitewater recreation at the project. By contrast, the Districts used existing information to forecast a near doubling in demand for reservoir recreation parking at the developed boat launches by 2050. *See* Recreation Facility Condition, Public Accessibility, and Recreation Use Assessment Study Report (RR-01), p. 5-158, Table 5.11-12.

Since a small number of boaters began paddling the Tuolumne in the late 1960s and early 1970s, use of the Tuolumne whitewater run has grown to approximately 6,000 paddlers in a year. Whitewater Boating Take-out Feasibility Study Report (RR-02), pp. 1-4. This is projected to increase over the term of the new license. *See, e.g.,* Dept. of Boating and Waterways, *Non-Boating Recreation in California* (Mar. 2009), pp. ES-7 – ES-8, *available at* http://www.dbw.ca.gov/PDF/N-M_Boating/NM_Boating_in_CA-March_2009.pdf.

Recommendation: The FLA should use existing information to forecast the change in whitewater recreation over the term of the new license. We recommend that the Districts consider information from the U.S. Forest Service and Bureau of Land Management maximum put-in rules as well as all the reasons for variations in the past 48 years in projecting future demand. A meeting of whitewater users, including outfitters, other rafters, kayakers, federal agencies, and others interested persons, would provide useful insights for understanding number of put-ins to help project growth. Also, data is available from commercial sources such as those listed in the Recreation Facility Condition, Public Accessibility, and Recreation Use Assessment Study (RR-01), Section 8.0, which deals with annual survey of trends. Any forecast should consider future usage assuming both existing facilities and improved facilities; these figures will differ, since the present takeout is unsafe and a major impediment to use.

FERC’s requirement that the licensees gather recreation use data for 12 months, including both night and day use, beginning not later than March 15, 2014,¹⁷ appears to include Wards Ferry; this should assist FERC in quantifying existing whitewater use.

2. The DLA Considers Improvements to the Whitewater Boat Ramp but Not to Other Related Take-Out Facilities.

The DLA appropriately identifies lack of safe, efficient take-out facilities as a limiting factor on whitewater recreation. DLA at Ex. E, p. 3-200. It states that relicensing participants identified improvements that could be made to Wards Ferry Bridge to provide safe and efficient whitewater takeout. *Id.* It also identifies Moccasin Point Recreation Area and Deer Creek and Deer Flats as potential additional take-out locations. *Id.*

As stated in our comments on the initial Whitewater Boating Take-Out Improvement Feasibility Study (RR-02),¹⁸ we support the Districts’ study and implementation of take-out

¹⁷ OEP, “Letter to Turlock Irrigation District,” eLibrary no. 20140122-3119 (Jan. 22, 2014).

improvements at Wards Ferry Bridge and additional locations. However, we believe the Districts should consider other facilities improvements that address the complete whitewater experience. We compare existing takeout plans to a funnel, with whitewater boats and their passengers taking out into the large end of a funnel that compresses them and all their gear through the small end of that funnel onto a two-lane, rural road having one locked toilet, no potable water, very limited parking, and passenger buses maneuvering among lift trucks, dunnage, and boats.¹⁹ At the same time, local bank fishers and normal through-traffic are also using the area.

Recommendation: The FLA should consider whitewater facility improvements comparable to those provided for reservoir boaters to meet existing and future non-motorized boating needs. Such amenities should include broad take-out ramps, ample parking, potable water, good toilet buildings, warm showers, and availability of DPRA staff. Such facilities would greatly enhance the recreational experience. They would help mitigate project effects on whitewater recreation.

For the Wards Ferry Bridge takeout, or an alternative facility in that area, we specifically request that the FLA consider the following improvements:²⁰

1. A boat ramp that is at least 15 feet wide, with added width for installed guard rails, to provide for vehicle access all the way to the water at a range of reservoir levels. We are concerned that the current proposal would only provide vehicle access to the river's edge under high-water conditions. A major barrier to paddling the Tuolumne is the poor take-out option. We believe that an improved take-out will attract many new users and that the whitewater run will become increasingly popular. To accommodate this growth, ramps should be constructed on both sides of the river at Wards Ferry Bridge. A single ramp on one side of the river will not be sufficient to avoid overcrowding and conflicts.

¹⁸ See ISR Comments, pp. 13-15.

¹⁹ Very few improvements have been made for whitewater boating since the original license issued. Early in the License the Don Pedro Recreation Agency (DPRA) added a bollard at the top of the takeout path to stop local traffic from blocking the old road ramp. In 1987, the Districts agreed to a small toilet (License Article 53) that has been heavily vandalized, and to woody debris removal in Wards Ferry arm (License Article 52), which has been effective. Prior to these improvements, whitewater boaters pushed and pulled their way for hours through miles of wood debris, and there was no toilet at all.

By contrast \$8,000,000 was made available in 1966 for the present recreation facilities around the Don Pedro Project site; \$1,142,250 from Modesto Irrigation District, \$2,179,342 from Turlock Irrigation District, \$3,878,408 from City and County of San Francisco (CCSF), plus some Davis-Grunsky State of California recreation funds. Today those three government bodies (TID, MID and SFPUC) fund and control the operation of DPRA that manages the Project recreation facilities.

²⁰ Whitewater boaters do not need the green grass, raised BBQ grills, electric hookups, or coin-operated phone booths provided at Fleming Meadows because boaters generally will not spend a long time at this day-use facility. Similarly, we do not support the proposal to tow whitewater boats to Moccasin Point boat launch. See Whitewater Boating Take-Out Improvement Feasibility Study (RR-02) at 6-3. Tow options are currently available to whitewater boaters but infrequently used. This would not improve take-out options for whitewater boaters.

2. Graded footpaths on both sides of the river down to the low water mark to help alleviate overcrowding on the boat ramps.
3. Improved toilet facilities. The facilities at Wards Ferry Bridge are unlocked only when whitewater outfitter employees are present, because of vandalism. An alternative should be developed that provides toilet access to all whitewater users.
4. Access to potable water. At present, there is none.
5. Adequate, safe parking. At present, there are approximately 20 marked spaces. Vandalism at night is common, and is becoming more common even during daylight hours.
6. Reduction of potential user conflicts with bank fishers and other reservoir users who might park on an improved ramp meant for outfitter truck and kayaker truck and car use. The three current takeout ramp plans do not include a gate for controlling vehicle access to improved ramp(s).
7. Avoidance of overcrowding while arriving boaters wait on the two-lane Wards Ferry Bridge for a shuttle bus or car shuttle to arrive. The Districts have not forecasted future increase in use over the life of the license. Instead, they state “projected future use alone cannot guide decisions” about the take-out. Whitewater Boating Take-out Feasibility Study (RR-02), Attachment A, p. 3-14. The Districts should quantify present use (number of people and vehicles) using Wards Ferry Bridge, similar to the quantification for the reservoir recreation facilities study.²¹ This will inform the Commission in setting the number of take-out ramp(s) and other take-out facilities to build for present and for projected future need. We believe that ramps on both sides of the river at Wards Ferry will alleviate overcrowding.
8. A radio repeater and/or cell tower that would allow law enforcement, DPRA, and individuals cell phone use for injury and communication with shuttles, as well as personal use. Local boaters have been told that County sheriff’s deputies now do not go to Wards Ferry at night because of lack of cell connectivity.
9. Increased security for cars left overnight and for facilities, such as toilets. The Districts should consider recreation payment agreements to provide resources for coordinated security patrol/presence by BLM, USFS, and/or DPRA.

²¹ Recreation Facility Condition, Public Accessibility, and Recreation Use Assessment Report (RR-01), p. 5-34, Table 5.4-4. The Districts have reported numbers of vehicles and persons at one time (PAOT) at Fleming Meadows and other reservoir facilities. Equivalent quantification is needed for the Wards Ferry Bridge take-out location and for the county road that serves kayakers, rafters, and guides.

10. An unobstructed turnaround for outfitter shuttles at Wards Ferry Bridge or at the other possible take-out sites that is kept clear for boater use.
11. Warm showers and changing rooms similar to those now offered at one third of other DPRA facilities.
12. As a potential alternative to recommended amenities immediately adjacent to the take-out site, an organized shuttle operated by DRPA to a nearby site that provides such amenities. This alternative, first raised at the field meeting with Nancy Crain, HDR (Sept. 13, 2013), could quickly move whitewater boaters and passengers and their gear away from the congestion on Wards Ferry Bridge.

3. The DLA Does Not Resolve the Lowest Boatable Flow.

The DLA identifies existing flows as a potential limiting factor on recreational boating in the lower Tuolumne River, and describes the boating flow study undertaken by the Districts to determine the lowest boatable flow. DLA at Ex. E, p. 3-193.

We thank the Districts for a much-improved effort to collaboratively implement the Boatable Flow Study (RR-03) in 2013.²² The data from the surveys presented in the Boatable Flow Study Report is accurate, but we have concerns about the Districts' data analysis. The report appears to imply that 125 cfs and 150 cfs could be considered boatable. The data analysis conducted by the National Park Service shows that this is not the case.

Our primary area of concern with the Boatable Flow Study Report is how it addresses the survey question: "Would you return at this cfs level?" The Districts weighed "Definitely No" against "Possibly," "Probably," and "Definitely Yes." This gradation results in an evaluation where 50% of survey respondents say that 150 cfs is boatable. The National Park Service's analysis of the same question weighs "Definitely No" and "Possibly" against "Probably" and "Definitely Yes." This ranking makes a flow of 150 cfs clearly not boatable in the opinion of survey respondents, and significantly reduces the positive responses to a flow of 175 cfs. We also note that the report states that the two drift boaters who participated in the 200 cfs flow reported a negative experience.

Recommendation: The FLA should consider 200 cfs as the "Lowest Boatable Flow" for all watercraft types, with the exception of drift boats, which have a higher minimum, to be determined. The FLA should consider flow release schedule(s) that provide adequate flows for boating on the lower Tuolumne during the April-November paddling season. It should consider how best to coordinate boating flow releases with releases for other purposes such as water supply and protection of fisheries, particularly in the spring and summer months. Improved flows will allow a significant increase in usage along 52 miles of the Tuolumne River. This will

²² Whereas the 2012 efforts did not keep to the approved schedule, collected very little data, and did not adequately analyze conditions for a range of watercraft type, the 2013 effort made significant improvements on all these fronts.

also provide socioeconomic benefits to one of the fastest growing regions in the state, which is currently lacking in outdoor recreation activities.

F. The DLA Does Not Adequately Consider the Project’s Socioeconomic Effects on Non-Consumptive Uses.

The DLA highlights the importance of the project to the economies of the central San Joaquin Valley and San Francisco Bay Area.²³ DLA at Ex. E, pp. 3-267, 3-268. It states,

As the Don Pedro Project is primarily a water supply project serving regional agriculture, municipal, and industrial water users, any changes in Project operations may have broad socioeconomic effects well beyond changes to hydropower operations.

Id. at Ex. E, p. 3-267.

We agree that the project has broad socioeconomic effects. We are concerned that the DLA and Socioeconomics Study Report (W&AR-15) do not adequately consider socioeconomic effects related to improved fisheries, recreation, tourism, and ecosystem services in the lower Tuolumne River.

We request that the Districts supplement the Socioeconomics Study Report and include in the FLA additional information to determine and mitigate the socioeconomic effects of the project on all sectors of the economy.

1. The Socioeconomics Study Does Not Differentiate Between Water Supply and Instream Flows.

The DLA and Socioeconomic Study focus on the potential economic impacts of reduced water supplies on areas served by the Districts. DLA at Ex. E, pp. 3-268, 3-269. This is different than the potential economic impacts of improved instream flows in the lower Tuolumne, which FERC will ultimately determine. The two have a limited correlation.

In many years there is “excess” water in the system (more water than is used for human purposes and to meet the existing instream flow requirements), enabling excess water to be captured for future years. In years when Don Pedro Reservoir is at or near capacity, additional water is released downstream. Therefore, in many cases an improved flow schedule would have limited impacts on water supply.

Recommendation: The Socioeconomics Study should be supplemented or amended to include additional information to evaluate the potential impact of increasing instream flows on the lower Tuolumne. The Districts should look at past hydrological conditions and water use and

²³ OEP determined, “[f]or water resources, aquatic resources, and socioeconomics we define the geographic scope as extending upstream on the Tuolumne River to Hetch Hetchy and extending downstream to San Francisco Bay.” OEP, “Scoping Document 2,” eLibrary no. 20110725-3020 (July 25, 2011), p. 34.

estimate how often, and by how much, the Districts might expect to face water shortages under various new instream flow requirements.

The study should also consider measures that the Districts could implement to improve the efficiency of their water delivery systems. In 2012, when Modesto Irrigation District (MID) and the San Francisco Public Utilities Commission (SFPUC) were negotiating a potential water transfer, MID announced it could make an additional 25,000-40,000 AFY (acre-feet per year) available by preventing water loss from aged infrastructure. An alternative to selling this water to an out-of-basin user could be to make it available for in-District use or to meet instream flow requirements.

2. The Socioeconomics Study Does Not Consider Alternative Consumer Response to Reductions in Water Supply.

The DLA emphasizes growers' and producers' dependence on reliable water supplies from the project. DLA at Ex. E, p. 3-269. The DLA does not propose any changes to project operations and so does not forecast any effects to these users. However, the Socioeconomics Study Report suggests that any increases in instream flows would have significant effects on these users.

The Socioeconomics Study Report presents a worst-case scenario of economic losses resulting from increased instream flows. It assumes losses would occur across the board and would be proportional to reductions in water supply. Table 8.1-1 simply shows "[e]stimated gross revenue by crop for a range of agricultural water supply shortages," assuming a reduction in water supply would result in an equal reduction in crop value.

In reality, consumers will adjust to reductions in water supply in order to minimize economic losses. See "Rebuttal Testimony of Roger Mann, Ph.D.," eLibrary no. 20090922-5055 (Sept. 21, 2009), pp. 8-9. Through irrigation efficiency, farmers could grow more crops with less water. *Id.* at 9-10. There would be a cost to purchasing and installing the necessary equipment, but much of this money would stay in the Districts, creating new jobs.

The Socioeconomics Study Report assumes high water efficiency and conservation are already in practice, yet for irrigated acreage, hay and corn-silage are the second and third most common crops. These are very low marginal-value crops. A major series of engineering, agricultural, and economic studies in the Yakima Basin for the Bureau of Reclamation and Washington Department of Ecology recently found that using transactions to shift water from low-value crops to high-value crops during drought periods effectively led to no net loss of farm revenue, particularly because net revenue of low value crops, like hay, per acre-foot of water is very low.²⁴

²⁴ U.S. Bureau of Reclamation, "Yakima River Basin Integrated Water Resource Management Plan: Four Accounts Analysis of the Integrated Plan" (October 2012), available at: <http://www.usbr.gov/pn/programs/yrbwep/reports/fouraccounts.pdf>.

These studies also demonstrate all manner of system-wide irrigation efficiencies and crop choice opportunities to avoid any significant net loss of revenue to farmers. Plentiful water supply for senior water rights holders had previously resulted in little incentive for efficiency or optimization of water usage under scarcity. This same series of studies found the value of instream flows for salmon to provide the largest share of benefits across all project benefits, including agricultural and municipal water uses.

The Socioeconomics Study Report states, “MID and TID do not currently have policies that allow for a one-year short term transfer of water from one grower to another grower. Therefore water could not be transferred from growers of annual crops to growers of permanent crops.” Socioeconomic Study Report, p. 5.5. We understand that this is a policy decision that is changeable at the Districts’ discretion.

Regarding “Regulated Deficit Irrigation” (RDI), the Socioeconomics Study Report states, “[f]or the baseline we assume growers in TID and MID are practicing RDI and reductions in irrigation supplies that could result from the relicensing go beyond the desired RDI levels.” *Id.* at 8-3. This is not necessarily the case. While RDI can improve the quality of grapes, it can also reduce the quantity, and not all growers would be eager to make this trade-off. An assumption like this should be supported by empirical evidence.

Recommendation: The Socioeconomics Study Report should be supplemented or amended to include data on water use, crop production, and crop value per unit of water applied over the past few decades. If there is a demonstrated trend towards greater production efficiency, it should evaluate whether the trend is likely to continue, thereby lessening the economic impacts of reduced water supply. It should include more specific information regarding existing RDI practices. It should also consider other measures that could offset reductions in water deliveries such as short-term water transfers.

3. The Socioeconomics Study Does Not Adequately Consider the Socioeconomic Effects of Fishery Benefits and Costs.

The Socioeconomics Study Report does not address socioeconomic effects related to the depressed anadromous fisheries.

According to CDFW, “[t]he University of the Pacific has estimated the cost of the single 2008-2009 salmon fishery closure to include: (1) \$47.9 million in lost commercial income and 961 lost commercial jobs; and (2) \$70.5 million in lost recreational income and 862 lost recreational jobs (Michael 2010).”²⁵

The Districts have dismissed proposals to consider project costs borne by third parties other than water supply customers. For example, they responded to requests by Conservation

²⁵ Letter from Scott Cantrell, CDFW, to Charles Hoppin, SWRCB (Mar. 28, 2013), Enclosure 1, pp. 7-10 (citing Jeffrey Michael, “Employment Impacts of California Salmon Fishery Closures in 2008 and 2009” (2010)), available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pdsed/docs/comments032913/scott_cantrell.pdf.

Groups for more complete assessments of the economic consequences of fishery effects by claiming that connections between the project and fishery effects cannot be ascertained from data because the relationship is not adequately understood. By contrast, the Districts have dismissed considerable data that farmers have enjoyed record earnings despite drought and recession in favor of relying on assumptions about groundwater responses, which are much more difficult to track than the direct effects of water and habitat scarcity on fisheries. These modeling approaches overstate the benefits of unchanged project operations.

Recommendation: The Socioeconomics Study Report should be supplemented or amended to include an analysis of project effects on fishery resources and related economic benefits and costs, including commercial, sport, and recreational fishing. The declines in fishery resources and related industries in the Tuolumne River and the greater San Francisco Bay-Delta ecosystem are well-documented, and yet the Districts have not used existing information to adequately evaluate the project's role in this decline from an economic perspective.

4. The Socioeconomics Study Does Not Adequately Consider the Socioeconomic Effects of Increased Recreation Usage.

The Socioeconomics Study quantifies the economic benefits of recreation associated with Don Pedro Reservoir, but does not explain how increasing releases from the Don Pedro Development might impact the value of that recreation. Socioeconomics Study Report at Chapter 8; *see also* DLA at Ex. E, p. 3-270. Despite the amount of data provided, there is no marginal analysis (change in value) that might result from adjustments to the instream flow schedule.

While the impact of lower water levels on reservoir-based recreation is unclear, low river flows have a profound impact on rafting, canoeing, and fly fishing. The study does not quantify the potential positive economic benefits of improving recreational opportunities on the lower Tuolumne. The real net welfare effect for society in terms of recreation is largely a function of the scarcity of opportunities.

The potential economic benefits of increased recreation are significant. A study by John Loomis, the source of recreation values used in the Socioeconomics Study Report, found instream flow values for the Stanislaus River at \$45 to \$116 per acre-foot in 1989 dollars, which equates to \$85 to \$219 today.²⁶ These estimated benefits are likely low because they do not account for other instream flow values such as improvements in anadromous fisheries or the increasing demand for outdoor recreation, particularly river-based.

Recommendation: The study should be supplemented or amended to consider the scarcity of river-based recreation opportunities in the region, in terms of landscape, accessibility, difficulty and type of experience, as compared to reservoir recreation scarcity.

²⁶ John Loomis and Michael Creel, "Recreation Benefits of Increased Flows in California's San Joaquin and Stanislaus Rivers" (1992), *available at* http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/1995wqcp/admin_records/part05/374.pdf.

5. **The Socioeconomics Study Does Not Adequately Consider the Economic Value of Power Generation.**

Similar to recreation, the study provides data on the economic value of hydroelectricity, but fails to analyze how the new license might impact that value. Socioeconomic Study Report at ¶¶ 5.4, 6.2., 6.3, 6.5, 9.4; *see also* DLA at Ex. E, p. 3-270. Improving instream flows on the lower Tuolumne would not reduce the amount of hydroelectricity generated, but may affect the timing and value of project generation.

Recommendation: The study should be supplemented or amended to include analysis of the marginal cost of price differentials under alternative flow schedules.

6. **The Socioeconomics Study Does Not Consider the Potential Benefits of Reducing Landscape Irrigation.**

The Socioeconomics Study Report states, “[u]nder existing conditions, total [municipal and industrial (M&I)] water demand in the City of Modesto has averaged approximately 71,200 AFY between 2007 and 2011.” *Id.* at 8-6. This equals 23,211 million gallons per year, or 63.6 million gallons per day (mgd) for the City’s service area population of 264,000. This amounts to 241 gallons per capita per day.

In comparison, San Francisco, the largest city that depends primarily on Tuolumne River water, has a population of 825,000 and more than 450,000 jobs, but uses only 73 mgd. This amounts to 88 gallons per capita per day (based on residential population, not daytime population, which is much larger).

Climate and population density play a major role in the difference between water use in Modesto and San Francisco, but mostly in regard to landscape irrigation, which is largely non-essential. Therefore, it can be assumed that a reduction in water supply to the City of Modesto would largely impact landscaping, which provides aesthetic value, but has little economic impact.

Recommendation: The Socioeconomics Study Report should be supplemented or amended to consider the potential benefits of replacing water-thirsty landscaping with climate-appropriate vegetation and incorporating water-efficient irrigation.

7. **The Socioeconomics Study Overestimates the Value of M&I Water.**

The Socioeconomics Study Report states, “M&I water values range from \$143 per AF (for groundwater pumping) to \$700 per AF, reflecting the estimated willingness to pay by the SFPUC for municipal water supplies.” Socioeconomics Study Report, p. 9-3.

The water that SFPUC sought to purchase in 2012 was not intended for use within San Francisco, where the City has a very comfortable water allocation, including during droughts (future demand projections suggest water use might even decline). The transfer water was intended to meet the drought needs of the SFPUC’s wholesale customers, represented by the Bay

Area Water Supply and Conservation Agency (BAWSCA). However, BAWSCA is currently exploring a water transfer with EBMUD, with an established price of \$275 per acre foot.

Recommendation: The study should be amended to consider \$275 per acre foot as the upper limit for the value of M&I water.

8. The Socioeconomics Study Does Not Adequately Describe the Limitations of IMPLAN Data.

The Socioeconomics Study Report does not adequately describe the limitations and appropriate interpretation of IMPLAN data.²⁷ IMPLAN provides gross estimates of employment and spending impacts, but an appropriate marginal analysis would require runs including how money spent in the analytical scenario might otherwise be spent. The reality is that some share of expenditures would still occur, possibly with different targets. So some jobs and income would remain the same, and some other share would be reallocated to other businesses. For example, if there were a decline in agricultural production in the area, businesses processing the products of the project area would either process crops from other areas or shift resources towards other investments and services. Loss of a share of agriculture in the project area would not mean a corresponding loss of the full share of business associated with indirect and induced effects. In addition, other uses of the water, including instream flows, would increase jobs in other sectors, and downstream in other communities.

Recommendation: The Socioeconomics Study Report should be supplemented or amended to include additional runs of IMPLAN to better assess spending impacts under various project alternatives.

9. The Socioeconomics Study Does Not Adequately Incorporate Socioeconomic Elements Affected by the Project in the Benefit-Cost Analysis.

The Socioeconomics Study Report uses a benefit-cost analysis that omits significant benefits, such as recreation along the lower Tuolumne River, fish and wildlife resources, and ecosystem services. This is a departure from professional standards for preparing economic analyses, in particular the Office of Management and Budget's (OMB) Circular A-4, which provides guidance to federal agencies regarding regulatory analysis:

A good regulatory analysis should include . . . an evaluation of the benefits and costs—quantitative and qualitative—of the proposed action and the main alternatives identified by the analysis If you are not able to quantify the effects, you should present any relevant quantitative information along with a description of the unquantified effects, such as ecological gains, improvements in quality of life, and aesthetic beauty.

OMB, *Circular A-4* (2003), available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

²⁷ We described the limitations of IMPLAN data in our Comments on the Proposed Study Plan. See eLibrary no. 20111024-5102 (Oct. 24, 2011), pp. 29-30.

It further provides:

Benefit-cost analysis is a primary tool used for regulatory analysis. Where all benefits and costs can be quantified and expressed in monetary units, benefit-cost analysis provides decision makers with a clear indication of the most efficient alternative, that is, the alternative that generates the largest net benefits to society (ignoring distributional effects). This is useful information for decision makers and the public to receive, even when economic efficiency is not the only or the overriding public policy objective.

Id.

According to the guidance, all benefits and costs should be considered. For a balanced trade-off analysis, a common metric, dollars, is most appropriate.

When important benefits and costs cannot be expressed in monetary units, BCA is less useful, and it can even be misleading, because the calculation of net benefits in such cases does not provide a full evaluation of all relevant benefits and costs You should monetize quantitative estimates whenever possible.

Id.

U.S. Environmental Protection Agency (EPA) provides guidance for conducting economic analysis via *Guidelines for Preparing Economic Analyses*. It directly references Circular A-4 and reiterates the importance of capturing all benefits and costs, including passive use values:

Non-use value is the value that individuals may attach to the mere knowledge of the existence of a good or resource, as opposed to enjoying its direct use. It can be motivated for a variety of reasons, including bequest values for future generations, existence values and values of paternalistic altruism for others' enjoyment of the resource.

See EPA, "Guidelines for Preparing Economic Analyses," (Dec. 2010), p. xiv, *available at* <http://yosemite.epa.gov/ee/epa/eed.nsf/pages/guidelines.html>.

It is important to differentiate between benefit-cost analysis and economic impact analysis. Benefit-cost analysis is concerned with valuation of changes in the quality and quantity of goods and services, both market and non-market. Economic impact analysis, on the other hand, looks at how these changes in value translate to changes in jobs and income. The two types of analyses cannot be directly combined. For example, labor is a cost for benefit-cost analysis, and a job (a desirable thing) in economic impact analysis.

It is important to understand how the various types of economic analyses differ and complement each other to understand the overall picture of changes in amounts of value to society and distribution of that value. The implication for understanding the EPA guidance is that jobs and income are not part of a benefit-cost analysis and provide a different perspective on

some of the same values. Some of the goods and services are captured in market values and market activity that involves changes in output and employment, but no part of the benefits of the regulation are captured in the impact analysis by EPA.

Just as there are concerns with understanding all of the benefits and costs for a complete picture, so should consideration of output and job impacts consider the changes in economic activity associated with benefits and costs of a regulation.

It is difficult to understand the impacts of benefits, but just as with passive use values, it is not appropriate to assume a qualitative description is a measure of zero. One way to understand the completeness of an economic impact analysis is to consider the share of benefits and costs that are associated with its results. In this way, economic impact analysis can be considered something of a distributional analysis, as it shows where some of the value manifests in terms of economic activity.²⁸

Recommendation: The Socioeconomics Study should be supplemented or amended to incorporate benefits and costs of all elements, including benefits and costs to recreation along the lower Tuolumne River, fish and wildlife resources, and ecosystem services, consistent with professional standards for benefit-cost analysis.

II. Comments Regarding Cumulative Effects of the Proposed Action

As stated above, the FLA must explain the effects of the applicants' proposal on resources and otherwise provide information necessary for the Commission to prepare the Final Environmental Impact Statement. *See* 18 C.F.R. §§ 5.18, 380.3. This includes information regarding cumulative effects, which are defined as

²⁸ EPA states in its *Guidelines*:

An EIA identifies the specific entities that benefit from or are harmed by a policy, and then estimates the magnitude of their gains and losses. These estimates are derived from a study of the economic changes that occur across broadly defined economic sectors of society, including industry, government, and not-for-profit organizations. An EIA also examines more narrowly defined sectors within these broad categories, such as the solid waste industry or even an individual solid waste company. Therefore, EIAs may measure a broad variety of impacts, such as direct impacts on private business - including individual plants, whole firms, and industrial sectors - and indirect impacts on consumers and suppliers The term—impacts includes changes in profitability, employment, prices, government revenues or expenditures, and trade balances. For any regulation, it is essential to ensure consistency between the EIA and the benefit-cost analysis (BCA). If a BCA is conducted, the corresponding EIA must be conducted within the same set of analytical assumptions. To the extent possible, adjustments to these assumptions or to the overall modeling framework used for the BCA should only be made when absolutely necessary, and then should be noted clearly in the text of the analysis [T]otal social benefits and total social costs are not of primary importance in an EIA as they are in a BCA. Rather, the main focus is on the components and distribution of the total social benefits and costs.

Id., pp. 9-1 – 9-2.

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 DLA discusses project and other in-basin actions that are relevant to the Commission's evaluation of the project's cumulative effects on (1) water resources; (2) aquatic resources, including anadromous fish and their habitat; (3) geomorphology; and (4) socioeconomic resources. DLA at Ex. E, p. 4-1. However, the information provided is insufficient in several respects for the Commission to fully consider the project's cumulative effects or reasonable alternatives to mitigate those effects.²⁹ We request that the Districts clarify and/or supplement this discussion in the FLA consistent with the comments below.

A. The FLA Should Propose Measures to Mitigate the Direct and Cumulative Effects of Project Operations for All Purposes.

The DLA states that "all flow-related effects on the Don Pedro Project downstream of the La Grange Diversion Dam are, by definition, cumulative effects." DLA at Ex. E, p. 4-1. More specifically:

Don Pedro operations contributes to cumulative effects in the lower Tuolumne River by storing water which is then scheduled for release; however, under base line conditions, the direct effects to resources in the Tuolumne River are due to the diversion of water from the river at La Grange Dam, and not the operations of the Don Pedro Project.

Id. at 4-7.

The record does not show that the project does not have direct effects below La Grange Dam.

Conservation Groups have disputed the direct effects of project operations in a functionally identical situation in the relicensing of the Merced River Project (P-2179) (regarding whether releases of water from a FERC project storage reservoir passing an agricultural diversion downstream directly affect the reach downstream of the intervening diversion). *See, e.g.,* Conservation Groups, "Comments to [Merced] Study Dispute Panel," eLibrary no.

²⁹ FERC is "under a statutory duty to give full consideration to alternative plans," even where it "has no authority to command the alternative." *Scenic Hudson v. FPC*, 354 F.2d 608, 617-18 (2d. Cir. 1965) (internal citations omitted); *Green Island Power Auth. v. FERC*, 577 F.3d 148, 167 (2d. Cir. 2009). National Environmental Policy Act (NEPA) regulations similarly require that the NEPA document, "[i]nclude reasonable alternatives not within the jurisdiction of the lead agency" 40 C.F.R. § 1502.14.

20091123-5016 (Nov. 23, 2009), pp. 6-9; Conservation Groups, “Comments on [Merced] Initial Study Report,” 20110131-5038 (Jan. 31, 2011), p. 10.

The Director of OEP responded:

Regarding potential project effects upon downstream water temperature, we suggest that early season project releases from New Exchequer dam have a direct impact on water temperatures in lower Merced River. The model shows that the downstream of the [sic] extent of the project impacts upon water temperatures are highly dependent upon operational scenarios, but typically extend several miles downstream of Crocker-Huffman from late spring through early fall, beyond which the influence of ambient meteorology would require large volumes of release water as a means to control water temperatures.

OEP, “Revisions to [Merced] Study Plan,” eLibrary no. 20110401-3042 (April 1, 2011), App. B, p. 2. The Director continued:

Regarding downstream water quantity, existing hydrology data, and information in the [PAD] suggests that during the non-irrigation season (approximately November – February) when little or no diversions from Crocker-Huffman are occurring, the magnitude and duration of releases from New Exchequer dam have a direct effect upon flow-related habitat conditions in the lower Merced River, and also have an influence upon water storage availability during the remainder of each water year.

Id. at 5.

In the Merced relicensing, Conservation Groups continue to dispute whether releases from the project storage reservoir *during the irrigation season* directly affect the reach downstream of the licensee’s agricultural diversion. We nonetheless argue here that *at minimum* there is precedent on point that finding that project releases during times when there are “little or no diversions” from the intervening diversion dam are direct effects of the project. The bar should be no lower for the Don Pedro relicensing than it is for the Merced Project located only a few miles away.

The DLA distinguishes between project effects based on function. It states that power operations are incidental to water supply operations and have no adverse cumulative effects:

Hydroelectric generation at the Don Pedro Project does not impact any of the potentially cumulatively affected resources identified by FERC, except socioeconomic, because the flows released are not done so for purposes of power production and, absent power production at the Don Pedro Dam, these flows would be released on essentially the same schedule. The socioeconomic effect of power generation is a positive one due to it being a low cost source of energy and not a source of greenhouse gases.

Id. at 4-8.

Plainly the Districts release water from Don Pedro for multiple purposes. However, the DLA's distinction is not relevant to FERC's obligation to mitigate project effects and otherwise ensure that the project as licensed is best adapted to a comprehensive plan for developing or improving the Tuolumne River for the beneficial uses listed in FPA section 10(a)(1). The Commission's licensing authority does not turn on the purpose of an instantaneous flow release.

"The Commission has traditionally exercised jurisdiction to license even those dams which are not exclusively or even primarily built for the purpose of power generation." *Nat'l. Wildlife Fed'n v. FERC*, 912 F.2d 1471, 1482 (D.C. Cir. 1990). Under FPA section 4(e), the Commission may consider non-power benefits of a project in making its licensing decision under FPA section 10(a)(1). *Id.* Contrary to the DLA's arguments, this is not a one-way street. FERC's balancing decision under Section 10(a)(1) must address both the benefits and costs of non-power purposes and ensure that the project, for all purposes, is best adapted to a comprehensive plan of development.

Recommendation: The FLA should propose PM&Es that address the adverse effects of the project's regulation of flow, regardless of whether the primary purpose of flow regulation is water supply.

B. The DLA Does Not Include Sufficient Information Regarding Other In-Basin Actions to Evaluate the Project's Cumulative Effects.

1. La Grange Dam

The DLA states, "[t]he operation of La Grange Dam directly effects [sic] the flows in the lower Tuolumne River . . ." DLA at Ex. E, p. 4-13. La Grange is also the terminal barrier to upstream fish passage on the Tuolumne River.

The DLA does not propose to mitigate the Don Pedro Project's cumulative effects on fish passage on this basis:

As stated in FERC's July 25, 2011 SD2, the Don Pedro Project does not block the upstream migration of anadromous fish because the upstream extent of anadromous fish in the Tuolumne River is currently limited to areas below La Grange Dam.

DLA at Ex. E, p. 1-6. The Director of OEP's decision not to require fish passage studies at Don Pedro was based on (1) La Grange being the terminal barrier to fish passage, and (2) there being no mechanism for requiring fish passage at La Grange in the near future:

As we stated in Scoping Document 2 in response to requests to consider project effects on fish passage, the Don Pedro Project does not block the upstream migration of anadromous fish because the upstream extent of anadromous fish in the Tuolumne River is currently limited to areas below La Grange dam.

La Grange dam is not a Commission-licensed facility under the FPA. Even though NMFS states they need to study all fish passage options now, the facts are clear. The

unlicensed La Grange dam is the downstream barrier to the upstream migration of anadromous fish, and as a result, anadromous fish do not have access to areas upstream including to Don Pedro dam. Consequently, there is no nexus between the Don Pedro Project and direct effects on fish passage of anadromous fish.

OEP, “Study Plan Determination,” eLibrary no. 20111222-3041, p. 74 (Dec. 22, 2011).

On December 19, 2012, the Commission determined that it has mandatory licensing jurisdiction over La Grange on three separate grounds³⁰ and ordered the Districts to submit an application for license or exemption within 36 months. *See* 141 FERC ¶ 62,211 (2012). The Commission upheld the Order on Rehearing.³¹ *See* 144 FERC ¶ 61,051 (2013). The Districts have appealed to the D.C. Circuit Court of Appeals. The Commission denied the Districts’ Motion for Stay pending the outcome of the appeal.³² The Districts commenced licensing on January 29, 2014, filing a Pre-Application Document. *See* eLibrary no. 20140129-5254. On February 24, 2014, the Districts will hold a meeting regarding selection of a licensing process.

As a result of the Order, La Grange Dam is now subject to compliance with whatever fish passage requirements may apply under the FPA. The Director of OEP’s basis for not requiring fish passage studies at La Grange no longer stands.

Recommendation: At minimum, the FLA should use existing information to identify potential alternatives for addressing the project’s cumulative effects on fish passage.

2. San Joaquin River Restoration Settlement Act

The DLA describes the San Joaquin River Restoration Program, which “outlines a comprehensive long-term effort to provide flows in the San Joaquin River from Friant Dam to the confluence of the Merced River to restore a self-sustaining spring-run Chinook salmon fishery while reducing or avoiding adverse water supply impacts.” DLA at Ex. E, p. 4-45.

The DLA does not include adequate information to determine how reoperation of Friant Dam affects the project’s cumulative effects on salmon and steelhead in the San Joaquin River.

³⁰ The Commission found that La Grange Complex is jurisdictional under FPA section 23(b)(1) because it (1) is located on a navigable water of the United States, (2) occupies lands of the United States, and (3) is located on a Commerce Clause water, has had post-1935 construction, and affects the interests of interstate or foreign commerce. *Turlock and Modesto Irrigation Districts*, 141 FERC ¶ 62,211 (2012). Any one of these bases is sufficient to establish mandatory licensing jurisdiction.

³¹ The Districts’ challenged each basis for jurisdiction. Districts, “Request for Rehearing and Motion for Stay,” eLibrary no. 20130118-5187 (Jan. 18, 2013). Conservation Groups’ supported the finding of jurisdiction, but challenged FERC’s finding that La Grange was not used and useful to power generation at the Don Pedro Project. Conservation Groups, “Motion to Intervene and Partial Request for Rehearing,” eLibrary no. 20130118-5256 (Jan. 18, 2013). Tuolumne River Trust has also petitioned for judicial review of the Order, and several Conservation Groups have intervened.

³² “Order on Rehearing, Clarifying Intervention Status, and Denying Stay Pending Judicial Review,” eLibrary no. 20130719-3031, p. 45.

For example, 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 Tuolumne River. This may improve success of rearing and outmigration of juvenile salmon and steelhead from the Tuolumne 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 to outmigrating Tuolumne River salmon and steelhead because of thermal increases.

Recommendation: The FLA should include alternatives that consider various flow releases from Friant Dam and varying water temperature impacts, and should consider potential measures that would create benefits for Tuolumne River salmon and steelhead from increased Friant releases.

3. Update of Bay-Delta Water Quality Control Plan

The DLA discusses Delta Water Quality Control Planning, including the Bay-Delta Water Quality Control Plan. DLA at Ex. E, p. 4-46. The SWRCB is in the process of updating the Bay-Delta Plan “to restore and protect the Delta ecosystem.”³³ 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. *Id.* The SWRCB is

proposing narrative flow objectives to support and maintain the natural production of viable native SJR watershed fish populations migrating through the Delta, and will recommend actions to others for non-flow measures and other factors not within its authority. This SJR flow proposal will establish February through June flow requirements of 35 percent of unimpaired flow for three salmon bearing tributaries—the Merced, Stanislaus and Tuolumne rivers Currently, median February through June flows in the Merced, and Tuolumne rivers are less than 35% of unimpaired flow more than half of the time, so this proposal would require increased flows to meet the proposed requirement.

Id.

In comments on the SWRCB’s Substitute Environmental Document (SED) for Phase I, the Districts disputed the SWRCB’s authority to establish instream flows on rivers below FERC-licensed projects: “[t]he proposed project is unlawful because the State Water Board does not

³³ 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.

have jurisdiction to set minimum stream flows on the Stanislaus, Tuolumne, and Merced Rivers below [FERC] licensed facilities.”³⁴

Conservation Groups support the Board’s use of its planning authority to establish instream flows for the Tuolumne and other tributaries. In addition, there does not appear to be any legal dispute regarding the SWRCB’s authority under Clean Water Act section 401, 33 U.S.C. § 1341, to prescribe instream flows for the Tuolumne River in any water quality certification it issues for the project. *Id.* It is reasonably foreseeable that the State Water Board will condition certification on instream flow releases that are needed to help achieve tributary flow objectives adopted in the Bay-Delta Plan.

Recommendation: The FLA should use existing information to consider how project operations would be modified in response to a requirement that the Tuolumne River release between 30% and 60% of February – June unimpaired flow measured at the La Grange Gauge. It should consider that this requirement may be modified in multiple sequential dry year scenarios. It should also consider whether changes at the project would likely be made in coordination with changes at in-basin non-project facilities, e.g., CCSF’s Hetch-Hetchy system.³⁵ It should consider how alternative operating scenarios to comply with higher instream flows would change the project’s cumulative effects on water resources, aquatic resources, geomorphology, and socioeconomics.

4. Water Management in the Merced River

The DLA identifies flow regulation on the Merced River as one of the out-of-basin projects that cumulatively affect resources in the Bay-Delta. DLA at Ex. E, p. 4-33 – 4-34. It describes various water control projects on the Merced, but does not discuss any reasonably foreseeable changes at those projects.

³⁴ See San Joaquin Tributaries Authority, “Substantive Comments on the Draft Substitute Environmental Document” (Mar. 29, 2013), p. 6, available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pdsed/docs/comments032913/valerie_kincaid.pdf.

³⁵ “To the extent CCSF’s diversions affect compliance with the Districts’ FERC license, FERC may indirectly shape CCSF’s decisionmaking CCSF’s water bank storage credits in New Don Pedro are subject to reduction if, in further proceedings before the FERC . . . the FERC increases the water release requirements for fish that impair the Districts’ water entitlements.” Restore Hetch Hetchy, “Comments on Draft SED for San Joaquin Flow and Salinity” (Mar. 29, 2013), Attachment 3, p. 8, available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pdsed/docs/comments032913/spreck_rosekrans.pdf. In 1995, the Districts and CCSF agreed that the Districts would provide all of the water required to satisfy the minimum flow schedules set forth in the 1995 Settlement Agreement (and later adopted in the 1996 License Amendment), in exchange for an annual payment by CCSF to the Districts of \$3,500,000. It is not clear whether the Districts and CCSF would adopt a similar arrangement in response to any increased instream flow requirements in the new license. It is also not clear whether the Fourth Agreement controls the Districts’ and CCSF’s obligations if an entity other than FERC (e.g., State Water Board) requires increases to instream flow releases.

As discussed above, the State Water 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 Merced River Project (P-2179) has half the storage of Don Pedro Project and fewer potential miles of over-summering habitat for *O. mykiss*. This makes summer releases from the Tuolumne River even more important to protecting this fishery in the Bay-Delta.

Recommendation: The FLA should use existing information to consider how Don Pedro Project operations would be modified or coordinated in response to a requirement that the licensee of the Merced River Project release between 30% and 60% of February - June unimpaired flow into the lower Merced River as measured at the Shaffer Bridge Gauge. It also should consider that this requirement may be modified in multiple sequential dry year scenarios.

5. Bay Delta Conservation Plan and CVP and SWP Export Operations

The DLA summarizes expectations that the Bay Delta Conservation Plan (BDCP) will “provide for water supply reliability and recovery of listed species through a Habitat Conservation Plan (HCP) under federal law and a Natural Community Conservation Plan (NCCP) under state law.” DLA at Ex. E, p. 4-47. We do not dispute that these are desired outcome of proponents of BDCP. However, it is not yet clear that BDCP will meet these desired outcomes.

Further, operation of tunnels constructed as part of the BDCP is only one of several potential future scenarios for Delta export operations. A statement of expectations is inadequate to support the Commission’s evaluation of the project’s cumulative effects on water resources and aquatic resources in the Bay-Delta.

Recommendation: The FLA should use existing information to consider project operations in the context of a suite of reasonable Delta export operations, including South Delta export reductions or cessation in the February through June period, on their own or combined with operation of exports under BDCP (north Delta diversion) scenarios. In addition, the FLA should evaluate the benefits to Tuolumne River salmon and steelhead of the placement of various barriers in South Delta channels, as suggested above.

III. The Final License Application Should Describe the Specific Bases for Any Findings of Consistency with Comprehensive Plans.

Under 18 C.F.R. § 5.18(b)(5)(ii)(F), the FLA must “[i]dentify relevant comprehensive plans and explain how and why the proposed project would, would not, or should not comply with such plans and a description of any relevant resource agency or Indian tribe determination regarding the consistency of the project with any such comprehensive plan.”

The DLA states, “[a]n updated list and review of consistency will be included in the FLA.” DLA at Ex. E, p. 6-1.

Recommendation: The FLA should demonstrate the consistency of its specific PM&E measures with the specific goals and objectives in the relevant comprehensive plans.

IV. Summary of Recommendations

This section summarizes our recommendations for information to be included in the FLA, or for supplement or amendment to various updated study reports.

Technical Advisory Committee

1. The FLA should include a measure to continue the TAC, subject to the development of process protocols and definition of roles and responsibilities in consultation with interested agencies and NGOs. *See p. 3, supra.*

Project Effects on Groundwater

2. The FLA should provide updated groundwater data that includes 2008 to present. It should quantify the extent of groundwater overdraft, including any variations by location. If the FLA finds instream flow improvements at the project may reduce groundwater recharge, it should evaluate measures to mitigate that impact. *See p. 4, supra.*

Project Effects on Chinook Salmon

3. The Districts should clarify how they intend to reconcile the study schedule with their commitment to include PM&Es in the FLA due in April, 2014. *See p. 5, supra.*

4. The FLA should clarify the Districts' findings regarding project effects on spawning habitat and their significance; alternative spawning flow schedules; and the accessibility of suitable spawning gravel. The FLA should evaluate measures to improve accessibility of salmon to suitable spawning gravel. *See p. 6, supra.*

5. The FLA should consider measures to improve rearing and outmigration, including: flow increases to improve juvenile rearing habitat; pulse flows to stimulate outmigration; post-licensing Chinook Salmon Outmigration Study; and measures to complete channel restoration projects previously recommended by the TAC, or alternative projects. *See pp. 8-9, supra.*

6. The FLA should propose numeric objectives for successful outmigration of juvenile Chinook from the Tuolumne River, including percent and size of various lifestages leaving the river. It should consider a suite of PM&E measures to achieve these objectives, including improved flows, pulse flows, and physical habitat improvements, and not be limited to non-flow predator removal measures. *See pp. 11-12, supra.*

7. The FLA should consider alternatives in which various in-Delta operational improvements are combined with in-river PM&E measures. *See p. 13, supra.*

Project Effects on *O. mykiss*

8. The FLA should include measures to stabilize and increase the *O. mykiss* population in the lower Tuolumne River by evaluating an increase of summer flows to 300 cfs in all years and by proposing measures to improve the physical habitat conditions. *See* p. 20, *supra*.

Project Effects on Recreation

9. The FLA should include a reasonable estimate of change in whitewater recreation over the term of the new license by considering information from the Forest Service and BLM, convening a meeting of interested parties, and utilizing commercial data. *See* p. 21, *supra*.

10. The FLA should consider whitewater facility improvements comparable to those provided for reservoir boaters to meet existing and future non-motorized boating needs. Such amenities should include broad launch ramps, ample parking, potable water, good toilet buildings, warm showers, and DPRA staff. We provide specific recommendations for the Wards Ferry Bridge takeout. *See* pp. 22-23, *supra*.

11. The FLA should consider: 200 cfs as the “Lowest Boatable Flow” for all watercraft types, with the exception of drift boats, which have a higher minimum, to be determined; flow release schedule(s) that provide adequate flows for boating on the lower Tuolumne during the April-November paddling season; and how best to coordinate boating flows with flow releases for other purposes such as water supply and protection of fisheries, particularly in the spring and summer months. *See* pp. 24-25, *supra*.

Project Socioeconomic Effects on Non-Consumptive Uses

12. The Socioeconomics Study Report should be supplemented or amended to include additional information to evaluate the potential impact of increasing instream flows on the Lower Tuolumne. The Districts should look at past hydrological conditions and water use and estimate frequency and magnitude of water shortages under various new instream flow requirements. The study should also consider improving the efficiency of the Districts’ water delivery systems. *See* pp. 25-26, *supra*.

13. The Socioeconomics Study Report should be supplemented or amended to include data on water use, crop production, and crop value per unit of water applied over the past few decades. *See* p. 27, *supra*.

14. The Socioeconomics Study Report should be supplemented or amended to include an analysis of project effects on fishery resources and related economic benefits and costs, including commercial, sport, and recreational fishing. *See* p. 28, *supra*.

15. The Socioeconomics Study Report should be supplemented or amended to consider the scarcity of river-based recreation opportunities in the region, in terms of landscape, accessibility, difficulty and type of experience, as compared to reservoir recreation scarcity. *See* p. 29, *supra*.

16. The Socioeconomics Study Report should be supplemented or amended to include analysis of the marginal cost of price differentials under alternative flow schedules. *See p. 29, supra.*

17. The Socioeconomics Study Report should be supplemented or amended to consider the potential benefits of replacing water-thirsty landscaping with climate-appropriate vegetation and incorporating water-efficient irrigation. *See p. 29, supra.*

18. The Socioeconomics Study Report should be amended to consider \$275 per acre foot as the upper limit for the value of M&I water. *See p. 30, supra.*

19. The Socioeconomics Study Report should be supplemented or amended to include alternative runs of IMPLAN to better assess spending impacts under various project alternatives. *See p. 30, supra.*

20. The Socioeconomics Study Report should be supplemented or amended to incorporate benefits and costs of all elements, including benefits and costs to recreation along the lower Tuolumne River, fish and wildlife resources, and ecosystem services, consistent with professional standards for benefit-cost analysis. *See p. 32, supra.*

Cumulative Effects of the Proposed Action

21. The FLA should propose PM&Es that address the adverse effects of the project's regulation of flow, regardless of whether the primary purpose of flow regulation is water supply. *See p. 35, supra.*

22. The FLA should include proposals for addressing the project's cumulative effects on fish passage. *See p. 36, supra.*

23. The FLA should include alternatives that consider various flow releases from Friant Dam and varying water temperature impacts, and should consider potential measures that would create benefits for Tuolumne River salmon and steelhead from increased Friant releases. *See p. 37, supra.*

24. The FLA should use existing information to consider how project operations would be modified in response to changes in flow requirements: requirement that the Tuolumne River release between 30% and 60% of February – June unimpaired flow measured at the La Grange Gauge; requirement modification in multiple sequential dry years scenarios; coordination with changes at in-basin non-project facilities. It should also consider how alternative operating scenarios would change the project's cumulative effects on water resources, aquatic resources, geomorphology, and socioeconomics. *See p. 38, supra.*

25. The FLA should use existing information to consider how Don Pedro Project operations would be modified or coordinated in response to a requirement that the licensee of the Merced River Project release between 30% and 60% of February - June unimpaired flow into the

lower Merced River as measured at the Shaffer Bridge Gauge. It also should consider that this requirement may be modified in multiple sequential dry year scenarios. *See p. 39, supra.*

26. The FLA should use existing information to consider project operations in the context of a suite of reasonable Delta export operations, including South Delta export reductions or cessation in the February through June period, on their own or combined with operation of exports under BDCP (north Delta diversion) scenarios. *See p. 39, supra.*

Consistency with Comprehensive Plans

27. The FLA should demonstrate the consistency of its specific PM&E measures with the specific goals and objectives in the relevant comprehensive plans. *See p. 40, supra.*

V. Conclusion

We request that OEP direct the Districts to include adequate information to evaluate and mitigate the project's effects on beneficial uses of the Tuolumne River and waterways downstream consistent with the recommendations stated above. We thank OEP for this opportunity to provide comments.

Dated: February 24, 2014

Respectfully submitted,



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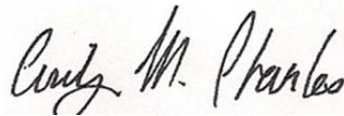
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CERTIFICATION OF SERVICE

**Turlock Irrigation District and Modesto Irrigation District,
Don Pedro Project (P-2299-075)**

I, Nicholas Niiro, hereby certify that I have this day served the foregoing document, "Conservation Groups' Comments on Draft License Application and Updated Study Report," by electronic mail on each person with an email address designated on the official service lists compiled by the Secretary in the P-2299-075 docket.

Dated: February 24, 2014

By:



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