



## Central Sierra Environmental Resource Center

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December 1, 2016

Jeanine Townsend, Clerk of the Board  
State Water Resources Control Board  
1001 I Street, 24<sup>th</sup> Floor  
Sacramento, CA 95814-0100



Dear Jeanine and members of the State Water Board:

This comment letter is submitted in response to the Draft Substitute Environmental Document (DSED) for proposed amendments to the 2006 Bay-Delta Water Quality Control Plan in regards to flow objectives for the Lower San Joaquin River (LSJR) and its three major salmon-bearing tributaries – the Stanislaus, Tuolumne, and Merced Rivers in order to enhance fish and wildlife beneficial uses, particularly for fall-run Chinook salmon and Central Valley steelhead.

Our non-profit center (the Central Sierra Environmental Resource Center) works to protect water, wildlife, and wild places in the Northern Yosemite Region of the Sierra Nevada. For much of the past two decades, CSERC staff has been involved in FERC relicensing for the Tuolumne and Stanislaus Rivers. CSERC understands the complex, multi-use demands on these rivers that provide highly valuable agricultural, industrial, and domestic water in the region, in addition to supplying water for the City and County of San Francisco. It is also pivotal to emphasize that the water left to flow downstream in these rivers provides for a wide range of highly important environmental benefits that are critical to the health of the basin ecosystem. As a result of all these demands, the three rivers have experienced significantly decreased river flows among other ecosystem-related consequences related to water temperature, dissolved oxygen levels, high fine sediment loads, and a loss of floodplain acreage, riparian habitat, and wetlands (DSED, p. 19-5; Kiernan et al. 2012). There has also been staggering declines, and even local extinction, of native fish populations in the basin, linked to decreasing spawning, rearing and outmigration success associated not only with insufficient flows but also increasing water temperatures, habitat degradation, introduction of non-native predatory fish species, pollution derived from agricultural, industrial, and private waste runoff, and numerous other stressors.

Based upon extensive dialogue our Center's staff has had with biologists and other specialists with state and federal wildlife agencies, it is clear that flows in the three rivers will better provide more optimum conditions for salmon and steelhead populations as well as other aquatic species, if the flows mimic the natural hydrographic conditions (e.g., relative magnitude,

duration, timing, and spatial extent of flows) of the basin that native fish species and other species have adapted to. However, our Center also understands the conflicting water needs within the basin. Therefore, despite the fact that scientific evidence suggests flows that more closely mimic the natural hydrograph better support native and at-risk fish populations (Marchetti and Moyle 2001; Kiernan et al. 2012), our Center does recognize the political and economic rationale for the State Water Resources Control Board (SWB) proposal to increase unimpaired flows for salmonids during important rearing and outmigration period (February through June) in the Stanislaus, Tuolumne, and Merced Rivers at their confluences with the LSJR to 40 percent as the starting point (LSJR Alternative 3).

Even though our Center agrees with many of the DSED concepts, our position is that there is still a need for substantial improvement in the final SED. The first section of this letter contains specific comments related to items within the DSED. The second section of this comment letter provides specific suggestions for improving the long-term success of salmonid recovery and the overall ecological restoration of the basin.

## **Specific Comments for Draft SED**

### **I. Alternatives**

#### **i. LSJR Alternative 1**

LSJR Alternative 1 will do little to contribute to salmonid recovery in the LSJR, Stanislaus, Tuolumne, and Merced Rivers due to allowing the continued removal of the vast majority of natural flow amounts to be diverted out of the three major tributaries to the LSJR. Our Center opposes LSJR Alternative 1, which would allow the continuation of the current flow requirements in the basin (or the lack thereof) in the Water Quality Control Plan adopted in 2006. Current water supply allocation in the basin is not enhancing fish and wildlife beneficial uses, but rather is actually leading to salmonid decline in the basin.

Presently, flows left in the Stanislaus, Tuolumne, and Merced Rivers below New Melones, Don Pedro, and Lake McClure, respectively, are often less than 20 percent of unimpaired (i.e., natural) flows. The current flow objectives in the Bay-Delta Plan for February-June depend on month and water year classification, which admittedly “does not reflect the frequency, timing, magnitude, and duration of natural flows” (Draft SED, p. ES-12). As a result, native fish species within the three rivers are declining and being replaced by non-native species. Historically, the basin supported Central Valley spring-run, fall-run, and potentially late fall-run Chinook salmon. Now what remain of Chinook populations in the basin (only fall-run) are at a very high risk of local extinction (Mesick 2009, 2010a, 2010b), and are in a steeper decline than in any other tributaries of the Sacramento or San Joaquin Rivers (DSED, p. 19-3 and Fig. 19-1).

#### **ii. LSJR Alternative 2**

The proposed plan direction of LSJR Alternative 2 will not provide sufficient river flows that will contribute to salmonid recovery in the LSJR and its three major tributaries. Our Center opposes LSJR Alternative 2 because this alternative would more or less continue the status quo -



- providing only 20–30 percent unimpaired flows between February and June in the three rivers at their confluences with the LSJR. Even worse, this alternative would only require leaving 20 percent unimpaired flows in the three rivers as the starting point. This alternative is really no different from existing conditions in the basin. In addition, SalSim modeling results presented in the DSED suggest unimpaired flows < 30 percent will have very little positive impact on adult salmonid production in the LSJR tributaries, and therefore Alternative 2 would not enhance fish and wildlife beneficial uses in the basin.

### **iii. LSJR Alternative 3**

Our Center's staff and the members who support us would collectively prefer to have a very high percentage of unimpaired flows required to be left in the three rivers. Nevertheless, recognizing the competing demands in this water-dependent society, and also recognizing the reality of California politics, CSERC agrees with the proposed alternative (LSJR Alternative 3) - to have 30–50 percent unimpaired flows required to be left in the Stanislaus, Tuolumne, and Merced Rivers from February-June, with 40 percent as the starting point.

Based on the DSED model results, the most probable unimpaired flow requirements that will benefit salmonid population recovery the most in the LSJR basins will be when unimpaired flows are  $\geq 40$  percent, with the highest increase in salmon production is estimated to occur at 40 percent unimpaired flow with 25 percent of that flow shifted to September through December through adaptive implementation (Draft SED, p. 19-87), which we are also in agreement with (see section IV of letter).

### **vi. LSJR Alternative 4**

CSERC is also in favor of LSJR Alternative 4, which would require 50–60 percent unimpaired flows from February-June, with 50 percent as the starting point. The 2010 Flow Criteria Report determined that approximately 60 percent of unimpaired flow at Vernalis February–June would be fully protective of fish and wildlife beneficial uses in the Stanislaus, Tuolumne, and Merced Rivers, and the LSJR when considering flow alone (Draft SED, p. ES-15). In the literature, researchers have found that increasing flows below dams and creating flow regimes that mimic natural hydrographs are positively related to native fish recovery, including Poff et al. 1997, Marchetti and Moyle 2001, Kiernan et al. 2012.

If comments submitted in response to the State's DSED were based only upon ecological needs, benefits to the recreation, fishing and tourism industry, river water quality, and recovery of a wide range of aquatic and terrestrial wildlife species associated with the three rivers, then our Center's staff and our members would narrowly advocate for LSJR Alternative 4. But because our Center also recognizes that the limited water resources in Central California are precious for so many social and economic reasons, as well as environmental values, we agree with the SWB that there are many beneficial uses (environmental, social, economical) to consider (17 beneficial uses under the Bay-Delta Plan, Draft SED Appendix K, p. 10). This is why our Center, rather than advocating for LSJR Alternative 4, is in reluctant agreement with the SWB's proposal to approve LSJR Alternative 3 -- which would 30–50 percent unimpaired flows from February-June in the Stanislaus, Tuolumne, and Merced Rivers, with 40 percent as the

starting point.

## **II. Alternative Flow Objectives Benefits/Impacts**

### **i. Salmonids**

CSERC agrees with statements made in the DSED that the preferred LSJR Alternative 3, as well as LSJR Alternative 4, would have positive benefits salmonids. Increased unimpaired flows will inherently have a positive impact on physical, chemical, and biological factors (e.g., decreased water temperatures, increased dissolved oxygen levels, decreased siltation settling on river bottom, increased benthic macroinvertebrate diversity, increased floodplain habitat, increased backwater and wetland habitat, and increased riparian habitat and corridors). These positive enhancements to the LSJR basin ecosystem will in turn lead to improvements in salmonid escapement, spawning, egg incubation, juvenile growth, smoltification, and juvenile emigration, and would also reduce the risk of disease, predation, and competition with warmwater non-native fish species. In addition to salmon and other aquatic organisms, terrestrial wildlife will also benefit from increased river and riparian productivity.

### **ii. Terrestrial biological resources**

CSERC agrees with statements made in the DSED that the preferred LSJR Alternative 3 would have less-than-significant impacts on terrestrial biological resources. Our Center acknowledges that in the *short term* increased flood inundation and increased flows will shift the location of the riparian corridors and wetlands within the river floodplain footprint, but bringing back the natural hydrographic conditions to the three rivers will increase wetland and riparian acreage that has been lost in the last century. CDFW (2014a) is cited in Chapter 8 stating that roughly, only 10 percent of the historical wetland acreage and less than 2 percent of the historical riparian acreage now remains in the San Joaquin valley. In addition, invasive plants have replaced most native species along the three rivers, and that plant communities are highly disturbed by cultivation, grazing, and development (CDFG 2007; USBR 2011b). Returning wetland and riparian habitats will increase resiliency of natural vegetation like cottonwoods, alders, elders, ash, willows, and sedges. Thereby creating more habitat for native wildlife including Swainson's hawk, osprey, longhorn elderberry beetle, western pond turtle, California tiger salamander, California red-legged frog, garter snake, river otter, muskrat, beaver, and coyote. Such ecological benefits may also make river habitat less available for invasive species like American bullfrog, red swamp crayfish, red-eared slider, European snails, and Chinese mitten crab.

### **iii. Groundwater resources**

CSERC does not agree with statements made in the DSED regarding the potential significant and unavoidable negative impacts of LSJR 3 to groundwater resources. The DSED states that LSJR Alternative 3 and 4 could reduce average annual groundwater balance by more than the equivalent of one inch in the three subbasins (Modesto, Turlock, and Extended Merced), cause a measurable decrease in groundwater elevations, and thereby have a significant and unavoidable depletion of groundwater supplies or interfere with groundwater recharge. In



actuality, increasing unimpaired flows would result in groundwater recharge through soil percolation (DSED p. 9-14). Surface water diversion depletes groundwater resources. Returning the LSJR tributaries to more natural hydrographic conditions does not deplete groundwater resources. However, the impact analysis in the DSED asserts that increasing unimpaired flow levels to levels suggested in LSJR Alternative 3 or LSJR Alternative 4 will significantly impact groundwater resources because both irrigation districts and public water suppliers are expected to pump even higher levels of groundwater that will “be needed” to replace the loss of water diversions.

Because of the California’s Sustainable Groundwater Management Act (SGMA, 2014), regardless of which alternative is ultimately chosen, waters users will have an obligation to ensure that there will not be unreasonable redirected impacts to groundwater resources (Draft SED, Appendix K p. 28). Therefore:

As part of the final SED, it would be important for the SWB to describe options for accomplishing both anticipated unimpaired flow objectives (30 to 50 percent unimpaired flow) while ensuring no unreasonable impacts to groundwater resources occur. Such strategies might include state approval of stronger restrictions against unregulated pumping or other actions to simultaneously improve the health and sustainability of the region’s rivers while also restricting over-drafting of groundwater resources in the region.

Since many of the groundwater aquifers in this region are currently considered to be highly overdrafted including the Eastern San Joaquin, Turlock, and Merced subbasins, CSERC asserts that irrigation districts and public water suppliers should not be allowed to pump groundwater from overdrafted subbasins at rates far above sustainable levels. As part of the overall management direction of water by the SWB, groundwater drafting should be addressed at the same time as the SWB approves a long-term management plan to enhance and restore the health of the three rivers, the LSJR, and the delta.

More descriptive language should be provided in the impact analysis chapter of the final SED that explains how the SWB will go ahead with increasing unimpaired flows while not allowing irrigation districts and public water suppliers from unreasonable redirected impacts to groundwater resources.

#### **iv. Climate change**

Our Center does not agree with the statements made in the DSED regarding the significant and unavoidable impacts of increasing unimpaired flows in the LSJR tributaries contributing to climate change. The impacts of LSJR Alternative 3 and LSJR Alternative 4 to climate change are incorrectly predicted to 1) generate GHG emissions and “exceed the 10,000 MT CO<sub>2</sub>e threshold”; and 2) conflict with a plan, policy, or regulation adopted for reducing emissions, related to the reduction in hydropower and increased groundwater pumping that would potentially have to occur to replace the lost surface water diversions. If instead of the state allowing a significant increase in groundwater pumping, the SWB could require limits that would protect groundwater and reduce any potential for increased greenhouse gas emissions.

According to CDWR's Climate Change Handbook for Regional Water Planning (2011), enhancement of floodplains, anadromous fish, and species migration should be included in resource management strategies to mitigate the predicted impacts of climate change to surface waters and groundwater resources in the region. Therefore, moving forward with Alternative 3 and increasing unimpaired flows to 40 percent, as a starting point would align with the DWR's suggested mitigation actions and resource management strategies.

### **III. Base Flows**

CSERC agrees with the proposed establishment of base flow requirement for Vernalis from February-June. The February-June Vernalis base flow requirements are especially pertinent in critically dry years to reasonably protect fish and wildlife beneficial uses. CSERC requests that the final SED describe the criteria for determining why base flow requirements for Vernalis from February-June would be between **800 and 1,200 cfs regardless of water year**. This analysis should describe the best available scientific information that is being used to determine the base flow criteria included in the DSED.

### **IV. Adaptive Implementation**

CSERC is in agreement with the DSED proposal that a portion of the February-June flows could be (1) shifted to other months, (2) shifted to any percent within the adaptive range, and (3) maintain a certain base flow at Vernalis to avoid adverse temperature impacts on fish and wildlife. Our Center strongly agrees with taking actions in dry years (when there is insufficient water availability) to best attempt to achieve temperature criteria in the summer and fall seasons in the basin.

In addition, in above normal or very wet years, when there is excess water supply at the end of the year, the SWB could provide management incentives to irrigation districts for maintaining excess reservoir carryover, if subsequent water years are predicted to be dry or critically dry years, to be available for irrigation district purposes or salmon purposes.

### **V. Biological Goals**

CSERC is in agreement with the Draft SED's biological goals as indicators of Chinook salmon and Central Valley steelhead population viability, including: abundance; productivity as measured by population growth rate (e.g., quality and quantity of spawning and rearing habitat, fry production, juvenile outmigrant survival to the confluence of tributary and LSJR); genetic and life history diversity; and population spatial extent, distribution, and structure (Draft SED Appendix K, p. 33).

Our Center urges the SWB to emphasize in the Final SED that a select number of the indicators of viability should be monitored and reported annually by the appropriate agency in order to assure that the best available information on salmonids in the LSJR and its tributaries.

### **VI. Non-flow Actions**



CSERC agrees with SWB highlighting the fact that increasing unimpaired flow, alone, will not lead to native fish recovery in the LSJR basin. Instead, non-flow actions, in addition to increasing unimpaired flows, will be necessary as supplementary strategies to better achieve viable populations of native fish in the LSJR basin (DSED p. 19-88).

Complementary to the proposed flow objectives in the Draft SED, SWB is recommending non-flow actions, or measures, to improve habitat conditions for native fish and wildlife, and also improve the effectiveness of management in the LSJR basin. [CSERC is in favor of all 10 of the non-flow measures proposed in the Draft SED](#) (Appendix K, p. 60).

## **General Comments for Draft SED**

### **I. Long-term Biological Objectives and Monitoring**

California lacks ecosystem-wide species drought resilience and recovery plans for its surface waters (Mount et al. 2016), but instead conducts long-term monitoring for a few at-risk species (e.g., salmonids) and reacts to environmental emergencies after much of the damage to biological and ecological functions have already occurred. In another drought-stricken area of the world, Australia's current water management system (under the Victorian Model) includes ecosystem-wide management objectives in place for surface waters regardless of the water-year type (e.g., wet, average, dry, drought). In a (1) drought year, the main objective is to protect species by avoiding critical loss, maintain key refuges, and avoiding catastrophic events; (2) in a dry year the main objective is to maintain river function and of key wetlands; (3) in an average water year the main objective is to recover by improving ecological health and improve recruitment for key animal and plant species; and (4) in a wet year the main objective is to enhance species by restoration of floodplain and wetland linkages and enhancing recruitment for key animal and plant species (Mount et al. 2016).

[The final SED should articulate long-term objectives and monitoring methods for each kind of water-year \(e.g., drought, dry, average, wet\) to either protect \(drought years\), maintain \(dry years\), recover \(average water years\), or enhance \(wet years\), for the viability of not only salmonids in the LSJR basin, but also other animal and plant species that are critical for river vitality in the LSJR and the LSJR tributaries.](#) This would create a robust and transparent policy framework for water managers to make decisions on water usage for all water conditions, like that which was established in Australia (Mount et al. 2016).

### **II. Who should be monitoring flow requirements and associated biological goals?**

The DSED states the STM Working Group will be established to assist in implementation, monitoring, and assessment of flow objectives and biological goals. The group will be comprised of DWR, NMFS, USFWS, and water users on the Stanislaus, Tuolumne, and Merced Rivers. However, this amount of involvement might make monitoring and assessment difficult. Our Center asks that the SWB consider having a coalition of interested stakeholders, like those suggested to be in the STMWG, to nominate 1-2 fisheries and hydrology-related experts to manage the monitoring and analysis of biological goals and non-flow actions, and ensure that these individuals also provide oversight for stakeholder responsibilities as they

pertain to the flow objectives.

### **III. Need for benchmarks or health targets for non-flow measures**

Specific to each river, the final plan should articulate specific benchmarks or health targets for each non-flow measure proposed in the DSED, like benchmarks or targets proposed in the literature (Arthington et al. 2006). Targets for acceptable, or even the best ecological conditions for each of the non-flow measures, specific to each river, would allow all stakeholders to understand what goals are to be met when moving forward with non-flow measures.

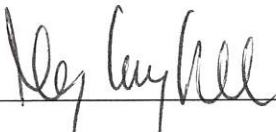
### **Summary**

**CSERC strongly advocates for the SWB approving LSJR Alternative 3 or LSJR Alternative 4 as the appropriate long-term strategy for the best managing the Stanislaus, Tuolumne, and Merced Rivers in order to improve the ecological condition of those three tributaries to the Lower San Joaquin River and the health of the Delta.**

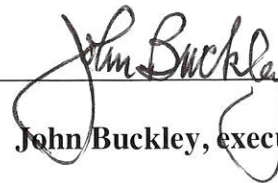
**If testimony and public comments justify reducing river flow requirements from the 50-60 percent of unimpaired flow that is proposed in LSJR Alternative 4, then CSERC accepts and supports a final action by the State Water Board to adopt LSJR Alternative 3, which would only provide partial flow enhancement benefits for the river systems, but would result in less social and economic impacts than would occur under the implementation of LSJR Alternative 4.**

**CSERC prefers LSJR Alternative 4, but supports the Water Board if the choice is made to soften the social and economic effects by instead choosing LSJR Alternative 3.**

Respectfully submitted,



Meg Layhee, aquatic biologist



John Buckley, executive director



## References

Arthington, A. H., Bunn, S. E., Poff, N. L., & Naiman, R. J. (2006). The challenge of providing environmental flow rules to sustain river ecosystems. *Ecological Applications*, 16(4), 1311-1318.

California Department of Fish and Game (CDFG). 2007. California wildlife: Conservation Challenges California's Wildlife Action Plan. Prepared by the U.C. Davis Wildlife Health Center. California Department of Fish and Game. Sacramento, CA. 597 pp.

California Department of Fish and Wildlife (CDFW). 2014a. Ecosystem Restoration Program Conservation Strategy for Restoration of the Sacramento–San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions.

California Department of Water Resources (CDWR), USEPA, Resource Legacy Fund, and USACE. 2011. Climate Change Handbook for Regional Water Planning. <http://www.water.ca.gov/climatechange/docs/Section%206%20Evaluating%20Projects-Final.pdf>

Kiernan, J. D., P. B. Moyle, and P. K. Crain. 2012. Restoring Native Fish Assemblages to a Regulated California Stream Using the Natural Flow Regime Concept. *Ecological Applications* 22(5):1472 – 1482.

Marchetti, Michael P., and Peter B. Moyle. "Effects of flow regime on fish assemblages in a regulated California stream." *Ecological Applications* 11.2 (2001): 530-539.

Mount, J., B. Gray, C. Chappelle, J. Doolan, T. Grantham, and N. Seavy. 2016. Managing Water for the Environment During Drought: Lessons from Victoria, Australia. Public Policy Institute of California. PPIC Water Policy Center. [http://www.pplic.org/content/pubs/report/R\\_616JMR.pdf](http://www.pplic.org/content/pubs/report/R_616JMR.pdf)

Poff, N. LeRoy, J. David Allan, Mark B. Bain, James R. Karr, Karen L. Prestegard, Brian D. Richter, Richard E. Sparks, and Julie C. Stromberg. 1997. The natural flow regime. *BioScience*, 47(11), 769-784.

U.S. Bureau of Reclamation (USBR). 2011b. Draft San Joaquin River Restoration Program Programmatic Environmental Impact Statement / Environmental Impact Report. Available: [http://www.usbr.gov/mp/nepa/nepa\\_projdetails.cfm?Project\\_ID=2940](http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=2940). Accessed: April 11, 2012.

