

October 18, 2010

Mr. Chad Dibble  
Department of Fish and Game  
1416 9<sup>th</sup> Street, 12<sup>th</sup> Floor  
Sacramento, CA 95814



#### DIRECTORS

**Stephen Arakawa**  
President

Metropolitan Water District  
of Southern California

**Curtis Creel**  
Vice President

Kern County Water Agency

**Joan Maher**  
Secretary-Treasurer

Santa Clara Valley Water  
District

**Russell Fuller**

Antelope Valley-East Kern  
Water Agency

**Thomas Hurlbutt**

Tulare Lake Basin Water  
Storage District

**Dan Masnada**

Castaic Lake Water Agency

**David Okita**

Solano County Water Agency

**Steven Robbins**

Coachella Valley Water  
District

**Ray Stokes**

Central Coast Water  
Authority

**General Manager**

Terry Erlewine

## Re: **COMMENT LETTER – DRAFT DELTA BIOLOGICAL OBJECTIVES AND FLOW REPORT**

Dear Mr. Dibble:

The State Water Contractors (“SWC”) appreciates the opportunity to submit comments to the Department of Fish and Game (“DFG”) on its Draft Report on the Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta (“Draft Biological Objectives Report” or “Report”). The SWC is a non-profit association of 27 public agencies from Northern, Central and Southern California that receive Delta supplies under contract from the California State Water Project<sup>[1]</sup>. Collectively, SWC member agencies deliver water to more than 25 million people and approximately 750,000 acres of highly productive farm land. The SWC has coordinated our comments with the comments of the State and Federal Contractors Water Agency (SFCWA) and strongly supports the SFCWA comments.

The SWC recognize the work DFG has put into the Draft Flow Report in the timeframe provided by the Legislature in Section 85084.5 of the Delta Reform Act. That legislation narrowly mandated DFG to develop and recommend to the State Water Resources Control Board “flow criteria and quantifiable biological objectives for aquatic and terrestrial species of concern dependent on the Delta” within twelve months of the statute’s enactment. DFG was asked only to look at the flow needs of the species. As the DFG has interpreted its task, it assumes that none of the “other stressors” impacting Delta fish and wildlife will be addressed and that the Delta will remain as it is today without any of the actions that will be implemented through the Delta Reform Act to improve conditions for Delta-dependant species. Unfortunately, development of flow criteria constrained in this manner simply cannot add to resolution of the issues in the Delta and its Watershed, and certainly will not advance the co-equal goals. Ultimately, we

<sup>[1]</sup> The 27 member SWC agencies are: Alameda County Flood Control and Water Conservation District Zone 7, Alameda County Water District, Antelope Valley-East Kern Water Agency, Casitas Municipal Water District, Castaic Lake Water Agency, Central Coast Water Authority, City of Yuba City, Coachella Valley Water District, County of Kings, Crestline-Lake Arrowhead Water Agency, Desert Water Agency, Dudley Ridge Water District, Empire-West Side Irrigation District, Kern County Water Agency, Littlerock Creek Irrigation District, Metropolitan Water District of Southern California, Mojave Water Agency, Napa County Flood Control and Water Conservation District, Oak Flat Water District, Palmdale Water District, San Bernardino Valley Municipal Water District, San Gabriel Valley Municipal Water District, San Geronio Pass Water Agency, San Luis Obispo County Flood Control and Water Conservation District, Santa Clara Valley Water District, Solano County Water Agency, and Tulare Lake Basin Water Storage District.

believe the flows identified in the report will have limited utility in informing the discussion of how to achieve benefits for Delta species in furtherance of the co-equal goals of the Delta Reform Act.

To its credit, DFG clearly articulates the narrowness of the analysis it was asked to do, and has done, and the additional analysis that must occur if these criteria, or any other flow requirements, actually are to be implemented. The first page of the Report's Executive Summary states that its recommendations:

“represent the current understanding of the needs of the individual species identified in light of current conditions and the objectives described. Several factors outside the scope of this legislative mandate would need to be considered and modeled or analyzed more fully (e.g., cold water pool management in upstream reservoirs, operational constraints, habitat restoration, and the relationship between flow criteria and unimpaired flow) before any flow standards are set. In addition, capital facility improvements, such as an alternative conveyance system, relocated water intakes, enhancement of floodplain and tidal wetlands, and additional fish screening may serve to improve conservation in the Delta. Flows by themselves are not the only consideration when the goal is the overall health of the estuary.”

The report recognizes further that flow is not the only factor affecting ecosystem health and fish population declines and that other factors such as non-native species, habitat loss and contaminants also adversely affect ecosystem productivity, nutrient dynamics and the foodweb. The Report notes three key factors that must be considered before any of the flow criteria could be implemented:

- “1. Balancing of the need to protect the Delta's aquatic and terrestrial ecosystem with the need for reliable water supply.
2. The proposed project description as presented in the context of the available scientific understanding provided in this document.
3. New research and monitoring not available when this report was completed that may better protect species of concern. (Report, page 103)”

In particular, we agree that striking the right balance between ecosystem and water supply needs and applying the most recent data and analysis are fundamental to achieving the Delta Reform Act's coequal goals.

The SWC's review of the Draft Biological Objectives Report has been coordinated with a similar review by the State and Federal Contractors Water Agency (SFCWA) and references many of the points made in the SFCWA comments. Overall, the SWC review has identified numerous concerns which are elaborated on below:

- The documentation of findings and recommendations, and the use of “best available science” does not appear to be rigorous

- The recommendations for at least two key species (Longfin smelt and Chinook Salmon) rely on incomplete or inaccurate data to identify species needs.
- The water supply impacts of the flow recommendations are not identified.
- No water quality objectives are identified and the science used to summarize current knowledge is already out of date.

### **DFG does not adhere to a defined or rigorous use of “Best Available Science”**

The Draft Biological Objectives Report contains principles that should be used to develop the flow criteria:

- “1. Flow criteria and biological objectives should be based on best available data and information contained in existing recovery plans, publications, reports, journal articles, etc. To the extent possible, DFG will use the flow criteria record developed by the Water Board during their 2010 Informational Proceeding.
2. In developing flow criteria, DFG recommendations will follow guidance in Water Code sections 85084.5 and 85086(c)(1).
3. Species to be covered by the biological objectives and flow criteria may include Federal and State listed species in the Delta (e.g., delta smelt, longfin smelt, etc.), salmon, other commercial/recreational fish species, and other species or habitats known to be influenced by both Delta inflow and outflow and which contribute to the heterogeneity and sustainability of the Delta ecosystem.”

Unfortunately, the approach to identifying and using the “best available data and information,” which comes directly from Water Code section 85084.5, is never defined and does not appear to have been applied in most instances. The closest that the report comes to identifying the steps for developing necessary data and information are in section 4.3 on Data and Information Used to Develop Biological Objectives. This section provides guideposts for the development of the flow objectives, including an initial step which would “Identify species with a survival or abundance relationship to flow” and a later step which would “Identify mechanisms or hypotheses about mechanisms that link species abundance, habitat, etc. with water flow and water quality objectives.” Very few of the flow criteria in the report comply with these steps, and therefore lack information that indicates a quantified relationship for survival or abundance to flow and identifying a specific mechanism relating species abundance with water flow and water quality objectives.

The flow criteria which comes the closest to meeting the DFG criteria of identifying an abundance relationship and a mechanism for the relationship is longfin smelt. A relationship between X2 and longfin smelt has actually been identified (Jassby et al. 1995; Kimmerer2002a; Kimmerer et al. 2009), although the relationship has been changing over the last two decades. While a relationship has been established for Longfin smelt, other potential relationships, such as food availability, are not compared to the flow relationship for their relative significance. Additionally, the DFG report does not include the statement set forth in the State Water

Resources Control Board's (SWRCB) recent report that "The biological basis for the spring outflow relationship is not known (SWRCB 2010)."

Recognizing that the DFG had an extremely compressed time frame for developing its flow criteria, it is understandable that the analysis was not as rigorous or comprehensive as would be desirable. To avoid this problem, DFG should, in the future, update similar analyses for flow criteria to reference specific, defined criteria for what constitutes "Best Available Science." Additionally, as recognized by DFG for delta smelt on page 77 of the Report, DFG should be seeking future analysis that includes population dynamics models, which are the state of the art for fisheries management and provide a rigorous method for identifying not only whether there is an relationship between flow and abundance, but how changes in flow can affect abundance.

### **Chinook Salmon**

The Draft Biological Objectives Report includes numerous OMR restrictions, including a -2,500 cubic feet per second limitation from November through June when salmonids are present in the Delta. The U.S. District Court for the Eastern District of California recently ruled that the less restrictive -5,000 cfs OMR flow restrictions imposed by the National Marine Fisheries Service (NMFS) for salmonid species was not supported by the best available science. As the Court noted, "[t]he only discernable and scientifically justifiable support provided in the BiOp for the negative 5,000 cfs ceiling on OMR flows under Action IV.2.3 is the salvage data, represented in Figures 6-65 and 6-66 of the BiOp." The Court highlighted "serious questions" about whether NMFS's had support for its OMR flow criteria. The particle tracking models they relied upon were "not a reasonably accurate prototype for behavior of [listed salmonids]." Additionally, NMFS improperly relied upon salvage data that was not scaled to population size, "an undisputed failure to use the best available science." NMFS also arbitrarily and capriciously relied upon ambiguous studies that in fact did not support their conclusions. Accordingly, the Court held that "[t]he -5,000 cfs OMR ceiling is based, predominantly on speculation . . . is not scientifically justified and is not based on best available science . . . and is arbitrary and capricious." That conclusion is even more applicable to the more restrictive -2,500 cubic feet per second criteria included in the Draft Biological Objectives Report. Other aspects of the NMFS Biological Opinion addressing Chinook salmon related flows, such as the San Joaquin River Inflow/Export ratio, should be treated with equal suspicion and not incorporated directly into the Draft Biological Objectives Report without additional scrutiny.

Additionally, as pointed out in comments by the SFCWA, the specific recommendation for flow levels of 13,000 to 17,000 cfs at Freeport for the purposes of avoiding potential reverse flows is based on misinterpretation of available data. The referenced reports (Perry et al. 2008, 2009) do not address the topic of potential impacts on the proportion of salmon migrating to Georgianna Slough. Instead, the recommendation appears to be based solely on an internal NMFS email (personal communication Del Rosario) that does not identify the basis for the finding that flow reversals occur at 13,000 cfs. In fact, review of available hydrodynamic modeling presented in the SFCWA review indicates that there is no flow reversal at the head of Georgianna Slough for flows as low as 10,312 cfs.

Finally, there is a need for population dynamics models for the analysis of the proposed Delta flow objectives on the overall population abundance of different Chinook salmon species. The Draft Biological Objectives Report correctly identifies the upstream needs of salmonid species for appropriate temperatures and coldwater pools. Population dynamics models should be applied to evaluate the tradeoffs of changed flow patterns on salmonid populations. Blind application of the draft biological objectives would create the likelihood of significant adverse impacts to overall salmonid population abundance from reduced summer flow and reservoir coldwater pool availability. Without use of population dynamics models, it is not possible to identify whether proposed flow levels would have a net positive or negative impact on overall population levels.

### **Longfin Smelt**

The Longfin Smelt science conclusions appear to constitute the primary basis for establishing most of the Delta outflow criteria. The outflow criteria are generally based on the Spring X2-Longfin Smelt abundance relationship. As pointed out previously, the SWRCB has found that “The biological basis for the spring outflow relationship is not known.” In contrast, the SFCWA have presented compelling data showing that a far better relationship exists between Longfin smelt population abundance and eurytemora affinis (e.affinis) densities. The eurytemora affinis densities, in turn, have a far stronger correlation with diatoms. The obvious mechanism for this strong relationship is the fact that diatoms are a primary food source for E.affinis. While the relationship between diatoms and X2 is very weak, the relationship between diatoms and ammonia/um is very strong. A robust series of studies (e.g., Dugdale, Parker, Glibert 2010 and in press) explains why ammonia/um is likely to suppress diatoms, which in turn suppresses E. affinis production. Overall, the explanation for food effects (caused in great part by ammonia/um) causing Longfin smelt abundance impacts is far superior to the information relating flows to Longfin smelt.

In addition to the inferior relationship presented between X2 and Longfin smelt, the Draft Biological Objectives Report also contains misleading statements related to the relationship of OMR flows and entrainment to Longfin smelt abundance. The report states that “The annual production of Longfin smelt is... inversely related to Old and Middle River(OMR) winter-spring reverse flows.” This statement is incorrect and appears to be based on the subsequent statement that “The population abundance of juvenile and adult Longfin smelt is also inversely related to the number of fish salvaged at the SWP and CVP facilities (TBI/NRDC4 as cited in SWRCB 2010.)” In fact, the TBI relationships identify an apparent statistical anomaly -- that at high Longfin smelt abundance levels in the fall there is low entrainment in the subsequent spring. No biological basis for this connection is identified. It should be clearly stated however, that the relationship identified by TBI does not state that entrainment affects the population of Longfin smelt, which is apparently what both the SWRCB and DFG are stating.

A direct correlation of Longfin smelt entrainment (indexed by population) with changes in Longfin smelt population abundance developed by SFCWA shows that there is NO statistically significant correlation of entrainment with subsequent population abundance. Low relative

entrainment of Longfin smelt has been associated with reductions in the population abundance and high relative entrainment of Longfin smelt has been associated with increases in population abundance. Based on this lack of a relationship between Longfin smelt entrainment and population abundance, the discussion of levels of OMR flows are not appropriate.

### **The Effects of Contaminants on Fish are not Given Appropriate Significance**

In spite of the charge to the DFG in Water Code Section 85086c “The flow criteria for the Delta ecosystem shall include volume, quality, and timing of water necessary or the Delta ecosystem under different conditions,” the Draft Biological Objectives Report does not provide any criteria related to water quality. In considering the effect of Contaminants on Fish, the Draft Report relies primarily on a 2009 summary by Chris Foe of the Regional Water Quality Control Board. Subsequently, Chris Foe has prepared an updated review of ammonia conditions in the Delta (Foe 2010) which is attached to this report.

The new Foe report identifies significant additional recent research with a wide variety of findings. Foe 2010 reports on new studies by several researchers on several topics including acute or chronic toxicity, inhibition of diatom primary production, and shifts in algal communities. On the subject of shifts in algal communities, Foe 2010 concludes as follows:

“In summary, evidence is accumulating that ammonia concentrations in the Sacramento River and Delta are at concentrations that may produce beneficial use impairments. The most robust evidence of impairment is the suppression of algal blooms in Suisun Bay. However, the observation that ammonia concentrations in the Delta may also suppress primary production and standing chlorophyll levels is important and, if validated by additional study, may help explain the low standing chlorophyll levels in the Delta and the recent POD (Pelagic Organism Decline). Follow-up studies are needed to confirm the effect of ammonia on the phytoplankton community and determine why chlorophyll levels decline down the Sacramento River.”

The DFG Draft Biological Objectives Report should be updated to reflect these new findings and future reliance on the objectives in the report should be reviewed based on ongoing research in this field.

### **Implementation and Water Supply Impacts**

As stated earlier, in framing its flow criteria DFG correctly identifies the necessity for “Balancing of the need to protect the Delta’s aquatic and terrestrial ecosystem with the need for reliable water supply.” The flow criteria in the Draft Biological Objectives Report are not presented in a format that lends itself to analysis. The Delta Outflow criteria in Table 16 specify flows between 11,400 cfs and 29,200 cfs from January through June without indicating which level would be required when. Several other criteria in Table 16 are similarly vague.

While not allowing for exact analysis of water supply impacts, the DFG Draft Flow Criteria are roughly similar to the Delta Flow Objectives identified by the SWRCB. The SWRCB's Appendix B (subsequently withdrawn) presented the only attempt at a comprehensive analysis of water supply impacts from proposed flow criteria, and they were enormous. Additionally, the Appendix B water supply impacts, while alarming, likely understate potential impacts to water supply and streamflow conditions. The Appendix B analyses did not consider water impacts of some measures (such as Wilkins Slough pulse flows and Freeport flows to address Georgianna Slough flow concerns.) It is not at all clear that the analysis reflects how the current water rights regulations would be implemented and appears to significantly reduce Central Valley in-basin water users with senior water rights. Additionally, the analysis makes the unrealistic assumption that Central Valley groundwater use would not increase to compensate for reduced surface water use. Any increase in groundwater use would result in reduced accretions and increased seepage that would considerably reduce Delta inflows.

Also not analyzed in the SWRCB Appendix B report were the likely impacts on other watersheds. As summarized in the SFCWA report, analysis of proportional implementation of the SWRCB Delta Flow Criteria would result in impacts of 43-48% to water users dependent on Putah Creek (the Solano Project) or the Mokelumne River (primarily East Bay Municipal Utility District and Woodbridge Irrigation Company.) Impacts on other watersheds in the Central Valley (like the Yuba River and American River) are likely to manifest themselves not as large reductions in local water supply, but as major reductions in the ability to provide required streamflow at other times of the year (primarily the summer) for salmonid needs and other instream beneficial uses. Finally, implementation of these kinds of flows would be problematic due to the physical capability of existing water management infrastructure. Potential release requirements would exceed current discharge facility capacities of many upstream reservoir and could not be achieved without construction major physical modifications.

In spite of probably unrealistic assumptions for reducing current upstream water uses, the SWRCB Appendix B analysis indicates that there are significant reductions in the level of coldwater pool remaining in Sacramento Valley reservoirs. There is no corresponding indication of the effect on San Joaquin Valley reservoirs, but they are likely to be similarly affected. The coldwater pool impacts, by themselves, represent only a portion of the impacts to salmonid species. The Appendix B studies also indicate that there would be significant reductions in reservoir releases for streamflow during periods of key salmonid temperature sensitivity. As stated previously, use of population dynamics models for salmonids is essential to review the potential benefits of any proposed delta outflow criteria. These populations models could also reflect the benefits of other measures (like habitat restoration, predator control or contaminant reduction) on overall population abundance.

### **Draft Report Summary Findings**

The Draft Biological Objectives Report concludes with numerous findings in Section 9.1.1. Many of these findings are not supported by the material contained in the report, or do not reflect any balancing of material contradicting the findings. For example, the first finding is:

October 18, 2010  
Mr. Chad Dibble  
Department of Fish and Game  
Page 8

“Recent Delta flows are insufficient to support native fishes in habitats that now existing in the Delta.”

This finding does not follow directly from the material presented in the report, and is somewhat contradicted by many of the presentations to the SWRCB.

Other findings that are especially problematic are as follows:

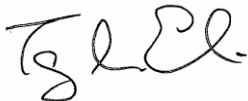
“Winter Delta outflow has a positive effect on delta smelt.” No statistical relationship has been developed that support this statement and the topic of how winter Delta outflow related to delta smelt populations is not presented in the Report.

“Ammonia does not appear to be acutely or chronically toxic to delta smelt and other species. More research is needed on the effects of nutrients on Delta ecosystem and its food web.” These statements should be clarified in light of the recent Foe 2010 report. While “ammonia” may not be acutely or chronically toxic to delta smelt, the recent research suggests that Sacramento Regional Wastewater Treatment Plant discharges in total may be toxic near the Plant. Foe 2010 also states that “evidence is accumulating that ammonia concentrations in the Sacramento River and Delta are at concentrations that may produce beneficial use impairments.”

DFG should include the findings within the text of the report, with the supporting information to support the findings specifically referenced. A compilation of the findings at the end of the report would then be useful. The findings should not be included in a final Report without presenting the research that supports the findings.

In conclusion, the SWC believe the Report’s recognition that flows by themselves are not the only factor in ecosystem health, that many other factors must be addressed, newer research and data must be consulted and a balance must be struck between the Delta ecosystem and water supply reliability is extremely significant. While the development of the flow criteria might have added necessary information to the equation, they do not in themselves provide the answer to how management of flow and the numerous other factors can be managed to meet the coequal goals of the Delta Reform Act. If you have any questions, please contact me at (916) 447-7357.

Sincerely,



Terry L. Erlewine  
General Manager

Attachment