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IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF CALIFORNIA

THE DELTA SMELT CASES **SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, et al. v. SALAZAR, et al.** **STATE WATER CONTRACTORS v. SALAZAR, et al.** **COALITION FOR A SUSTAINABLE DELTA, et al. v. UNITED STATES FISH AND WILDLIFE SERVICE, et al.** **METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA v. UNITED STATES FISH AND WILDLIFE SERVICE, et al.** **STEWART & JASPER ORCHARDS, et al. v. UNITED STATES FISH AND WILDLIFE SERVICE, et al.** **FAMILY FARM ALLIANCE v. KENNETH SALAZAR, et al.**	1:09-cv-407 LJO-DLB Consolidated With: Case No. 1:09-cv-422 LJO-GSA Case No. 1:09-cv-631 LJO-DLB Case No. 1:09-cv-892 LJO-DLB Partially Consolidated With: Case No. 1:09-cv-480 LJO-GSA Case No. 1:09-cv-01201-LJO-DLB **SECOND DECLARATION OF DALE HOFFMAN-FLOERKE** Judge: Honorable Lawrence J. O'Neill

I, Dale Hoffman-Floerke, declare that:

1. I am the Chief Deputy Director of the California Department of Water Resources (DWR). I have worked for DWR for 33 years and hold a Bachelor of Science degree in Fisheries Biology from Humboldt State University. Prior to my appointment as Chief Deputy Director in July 2012, I served as acting Deputy Director for Delta and Statewide Water Management, overseeing, among other DWR offices and divisions, DWR's Bay-Delta Office and the Division of Environmental Services. My duties also included working with National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS) and the U.S. Bureau of Reclamation (BOR) in the implementation of the delta smelt and salmonid biological opinions (BiOps), and serving as the Program Manager for the Bay Delta Conservation Plan (BDCP). In my current capacity as Chief Deputy Director, I continue to work with NMFS, FWS and BOR in the implementation of the BiOps and oversee the development of the BDCP.

2. Over the last six months, there has been a significant breakthrough in the development of the BDCP, resulting from intensive and fruitful collaboration between the state and federal agencies on design of the BDCP conveyance facilities and other key elements in the BDCP. The BDCP is intended to be a long-term plan, based on a comprehensive, multi-species conservation strategy that seeks not only to avoid jeopardy but to contribute to recovery of the delta smelt, salmonids and other aquatic species. In July 2012, the Secretary of the Interior, the Governor of California, and officials from NMFS announced significant design changes to the BDCP, including a reduction in the number of intakes from five to three, a reduction of capacity from 15,000 to 9,000 cfs, and design changes to reduce electricity consumption through gravity flow. These changes in the proposed BDCP design in turn triggered an intensive collaboration between the state and federal agencies to reach agreement on the remaining key elements of the

plan, including, e.g., the operational rules for the new conveyance facilities, and the conduct of the adaptive management planning process to be followed under BDCP.

3. In recent months, these discussions have become increasingly collaborative, and have resulted in the federal and state agencies involved in BDCP recognizing the considerable benefits of working together to achieve shared goals and solve shared problems. This improved atmosphere has also spilled over into the discussions of the implementation of the RPAs. As a result of both the BDCP negotiations as well as the common work on the science underlying the RPAs, there has been a genuine "paradigm shift." At both the management and the biologist levels, DWR joins the federal agencies in the belief that collaborative scientific efforts will achieve more protection for the fishery resources, as well as more efficient use of scarce water supplies.

4. The following will describe the recent science developments associated with RPA implementation and some of the scientific issues DWR wants to pursue through the Collaborative Science and Adaptive Management Program (CSAMP). Completion of this research will require the extended remand schedule that DWR and the United States have requested from this Court.

Science Developments in Implementation of the BiOps

5. DWR entered into litigation over the current Biological Opinions as a result of disagreements over their scientific underpinnings. While the scientific disagreements have not been resolved, there has been a marked improvement in the state and federal agencies' ability to work collaboratively to resolve them. Implementation of the RPAs has produced substantial new scientific information and analysis that is important for the implementation of the existing RPAs as well as to the development of the new BiOps. The scientific developments include (but are not limited to) information developed as part of implementation of the "Fall X2" RPA in the delta smelt BiOp, implementation of the Old and Middle River (OMR) restrictions in the delta smelt BiOp, and implementation of Actions IV.2.1 and IV.2.3 in the salmonid BiOp. While these

scientific developments are welcome and important, there is still a significant need for additional collaborative science as described below.

Science for the Fall X2 RPA

6. Implementation of the "Fall X2" RPA in the delta smelt BiOp was the subject of significant scientific debate during the litigation. Underlying this RPA is a conceptual model based on the belief that the "low salinity zone" (LSZ) is a biologically important area for delta smelt, and that the LSZ may have greater benefits when its geographic location is further downstream (seaward) during fall. The Fall X2 action provides for X2 in September and October to be maintained at 81 km in above normal years and at 74 km in wet years. The BOR initiated a study on the effectiveness of this action in 2011, based on the first implementation of the fall X2 action, as modified by an Order of this Court. The CSAMP anticipates the expansion of the existing experimental effort, to refine the conceptual model and answer other questions related to desirable delta smelt habitat attributes. The BOR study includes an adaptive management plan, with a conceptual model and hypothesized outcomes or predictions. Extensive information has already been collected; however, it is too early in the study to produce conclusive results. This is unsurprising given that the study is in the first year of what is intended to be a multi-year effort.

7. The CSAMP would broaden participation by all parties to the litigation and is intended to improve study design, and analysis of Fall X2 implementation. CSAMP would also allow for a broader range of investigation of other related subjects, including investigation of the adequacy of current monitoring programs to capture delta smelt location and abundance, development of quantitative estimates of delta smelt abundance, survival, growth and reproductive success as a function of salinity and habitat use, and assessment of the importance of additional environmental factors such as zooplankton availability, water velocities, nutrients, competition with other species and predation. CSAMP will take several years to develop information from these studies, but the program is likely to produce meaningful data and information by 2016 relevant to the BiOp reconsultation.

Development of Turbidity Triggers for Smelt Protection

8. The increased research and collaboration offered under CSAMP may also allow for the use of better tools to predict turbidity movement, which could affect the way RPA actions intended to reduce the entrainment of delta smelt are implemented. These RPA actions are designed to reduce delta smelt entrainment and what the BiOp describes as the "indirect pumping effects" on the species. While disagreement exists about the extent to which entrainment has an effect on delta smelt population abundance, reduction of delta smelt entrainment to the extent possible is a desired goal. Currently the RPA reduces entrainment primarily through mandated restrictions on negative flows in Old and Middle rivers, restrictions that have the effect of reducing project pumping in the South Delta. However, it is hypothesized that delta smelt can sometimes be induced to avoid the project pumps altogether by a combination of management actions that affect the turbidity plume which appears to trigger upstream migration. There are several ways to manage the turbidity plumes, which typically result from early and/or heavy rainfall events, involving reservoir releases and coordinated pumping operations. Successful implementation of this management action will require a thorough understanding of how turbidity moves through the system as well as the physical location of the majority of the delta smelt at the time of a turbidity event.

9. While there is growing confidence that turbidity management is a useful tool, there is still a need to test and refine the model to better predict when turbidity in the south Delta is going to increase, and how to reduce net reverse flows in advance of such time to minimize entrainment of adult delta smelt into the South Delta. Additionally, there is a need to better understand South Delta hydrodynamics, to understand how turbidity behaves once it has entered the South Delta. This winter much new information has been collected and is being analyzed to better understand the hydrodynamics in the South Delta and how best to operate to minimize turbidity attraction by delta smelt. The Metropolitan Water District of Southern California has developed a model to predict turbidity movement, and has begun working with FWS to assess the utility of the model for project operations and turbidity management. CSAMP will address and coordinate research as to the turbidity trigger issue and will allow a broad participation by all of

the parties to the litigation, thus increasing the likelihood of consensus over this management action. CSAMP involvement in this scientific effort will likely yield new data and information by 2016 that will assist in the BiOp reconsultation.

Development of Life Cycle Models for Delta Smelt and Salmonids

10. This Court and independent scientific reviews of Delta water management actions have called for the development and use of "lifecycle models" (LCMs). *In re Consolidated Salmonid Cases*, 791 F.Supp.2d 802, 841 (E.D. Cal. 2011); *In re Consolidated Delta Smelt Cases*, 760 F.Supp.2d 855, 885 (E.D. Cal. 2010). These models allow predictions of population level benefits to certain species in relation to specific conservation measures or management actions. For delta smelt, which typically live only one year, a lifecycle model could predict the benefits of taking action in different months or seasons of the year depending on which developmental stage of the fish is present at that time. However, there is not as yet a widely accepted lifecycle model for delta smelt. Presently, there are multiple, independent efforts underway to develop a delta smelt lifecycle model. Collaboration among these efforts would undoubtedly increase the efficiency of efforts to develop a delta smelt lifecycle model, hasten its completion and build greater confidence in its efficacy. Similarly, for salmonids, a lifecycle model could help to better define the role of river flows, State Water Project (SWP) and Central Valley Project (CVP) exports, OMR reverse flows, Delta inflow and outflow, tidal hydrodynamics and hydrologic conditions overall as factors affecting the migration route, migration rate, and overall survival of juvenile salmonids. NMFS is developing a lifecycle model for winter-run Chinook salmon which could also benefit from stakeholder input through CSAMP.

11. The CSAMP anticipates establishing a modeling group, which could serve as a forum for exchange of information about the development, structure and use of lifecycle models for both delta smelt and salmonids, with the objective of transparency. I anticipate that the modeling group could hold periodic meetings to describe the status of different LCM efforts, comment on LCMs being developed by others and collaborate with others on model development, develop common data sets and assumptions to use in the models; and conduct joint investigations of possible management actions to evaluate the population level relationship or

significance of these stressors or proposed actions. The new LCMs could be completed by the middle of 2014, and initial results from their use to evaluate benefits could be available by 2015.

Science to Improve Understanding of Salmonid Survival

12. Last year, NMFS and DWR jointly established the South Delta Salmonid Research Collaborative in response to questions about the study that was undertaken in spring 2012 under the 2012 stipulation agreement in the Salmonid BiOp cases. The purpose of the 2012 study was to generate information to improve understanding of how pumping rates, Old and Middle River flows, and juvenile steelhead migrations relate to one another. The 2012 study included the installation of a rock barrier at the head of Old River, a predator control study, operation and maintenance of an acoustic receiver array in the lower San Joaquin River and Delta, fish tagging releases, adaptive management of Old and Middle River (OMR) flows, and data analysis and report writing. The study was initiated by DWR in February 2012, with field work occurring between April and June. An Independent Review Panel convened by the Delta Science Program reviewed the study and found a number of defects in the study design. Rather than repeat the effort in 2013, the state and federal agencies agreed to use this year to develop a more robust study plan, including the development of conceptual theories, analysis of existing data sets, development of modeling tools and other research needs, all for implementation of a new study plan in spring of 2014. The goal is for the study plan for 2014 to be finalized by August 2013.

13. CSAMP is anticipated to provide the strong collaborative process needed to develop conceptual models to explain how hydrologic conditions affect juvenile salmonids as a framework for future investigations. The framework can then be used for a collaborative compilation and synthesis of data from previous studies to identify areas of agreement and areas of disagreement or uncertainty that would affect managed decisions. These key areas of disagreement or uncertainty would then be the subject of development of specific experimental designs to test specific hypotheses and alternative hypotheses as part of the development of the research program. Specific areas that DWR would like to see investigated are:

a. Location and timing of inserting tagged fish into the system

b. Identification of specific reaches and areas of reduced survival in the Delta

c. Monitoring of steelhead abundance and distribution to determine the abundance and dynamics of steelhead produced on the San Joaquin River tributaries, sources of mortality, effects of river flows and exports on migration and survival.

14. Many of these studies are already under discussion in the South Delta Salmonid Research Collaborative, which I co-chair along with Maria Rea of NMFS. However, this effort thus far is hindered by the lack of staff resources. This collaborative effort would have to be greatly curtailed if staff were redirected to revise the Salmonid BiOp under the current remand schedule. If the South Delta Salmon Research Collaborative is allowed to proceed, DWR anticipates that it will be able to provide meaningful data and information regarding salmonid survival by late 2014. This data and information could then be used in developing the remanded Salmon BiOp RPAs and other related aspects of the BiOp.

New Science Relationship to BDCP

15. DWR is drafting the BDCP for submission to the FWS, NMFS, and California Department of Fish and Wildlife, as part of its application for incidental take permits under Section 10 of the federal Endangered Species Act (ESA) and under the State Natural Community Conservation Planning Act (NCCPA) for the Delta operations of the SWP, as modified. The BOR will use the BDCP as part of its Biological Assessment in requesting an Endangered Species Act section 7 Biological Opinion for operations of the CVP. The BDCP is in the planning stage and no final decisions on any proposed conveyance facility can be made prior to the completion of regulatory and environmental review under the California Environmental Quality Act, National Environmental Policy Act, ESA, and NCCPA.

16. An administrative draft of the BDCP and the related Environmental Impact Report/Statement (EIR/S) were released in February 2012. Revised administrative drafts of the Plan and the EIR/S have been under preparation since the July 2012 announcement regarding changes in conveyance facilities, and will include new operational rules and a description of the BDCP Adaptive Management Program. A revised administrative draft Plan will be released

during the next few months, with the official public review draft of the Plan and the EIR/S expected to be released sometime this summer. The final Plan and EIR/S are expected to be complete in 2014, with permit issuance to follow soon thereafter. Many of the science issues associated with implementation of the RPAs have also been aired in the course of developing the biological goals and objectives and conservation measures in the BDCP. For example, should the Fall X2 RPA be included in the BDCP operational rules for the new facility? The BDCP establishes a decision tree process, which is intended to be a structured scientific review of the disagreements and questions associated with Fall X2 measure. The decision tree process will determine the outflow requirements to be in effect by the time the new facilities are ready to operate (approximately a decade from now). The BDCP will also be looking closely at other scientific questions as to how to provide more high quality habitat for delta smelt, including tidal marsh restoration, which will depend on monitoring and analysis of many of the same factors as will be evaluated for the Fall X2 RPA.

17. Another related issue under consideration is entrainment, which in the BDCP will be dealt with primarily through reliance on the new conveyance facilities instead of the existing South Delta pumps during times of concern over delta smelt and other species' presence in that area. Additional improvements in the south delta pumping operations may still be possible, however, and the turbidity management methods described above will provide considerable benefit to operations under the BDCP.

18. BDCP has established aggressive survival objectives for salmonids, but there are some questions as to whether and how best the objectives can be achieved, given uncertainties in current survival rates in different areas of the Delta. The work of the South Delta Collaborative described above will be an important part of a more comprehensive monitoring and analysis program that will be needed for BDCP implementation.

19. The development of agreed upon lifecycle models for delta smelt and salmonids has also been identified as an important need for the BDCP science and adaptive management program, both to help guide implementation of operational rules as well as to evaluate the efficacy of other kinds of conservation measures.

Structure of the Collaborative Science and Adaptive Management Program

20. It would be presumptuous for any of the parties to the litigation to delineate now in detail all the elements of the collaborative science program, because by definition the science questions to be answered, as well as the process used to answer them, must be developed collaboratively. Given the number of science questions and diversity of parties involved in this litigation, such an effort will necessarily be a multi-year effort. Not only is the science itself complicated, but a significant amount of time will be required to negotiate a process that all interests engaged in the litigation will have confidence in. Having said that, I will describe three key steps the CSAMP could undertake: 1) development of agreed upon hypotheses, or scientific questions, regarding alternative operational strategies and/or management actions; 2) review and synthesis of existing scientific information for the purpose of determining additional science needs and informing the design of alternative operations strategies; and 3) development of new modeling and other predictive tools with which to evaluate the effects of current and alternative strategies for protection and increased abundance of delta smelt and salmonids. The first two steps are immediate, while the third represents a somewhat longer-term science effort.

21. As stated earlier, the state and federal agencies have made tremendous progress towards a more collaborative relationship that will be critical to moving forward on the science issues pertinent to both the RPAs and BDCP. What is still missing, however, is integration of the Public Water Agencies and the NGOs – some of whom have commissioned or prepared scientific work on the above topics. The November 29, 2012 joint proposal lays out general elements of the

Collaborative Science and Adaptive Management Program. Additional collaborative work will be needed, among other things, to define the membership of one or more of the working groups described above, the ground rules for participation, agreement on the conceptual models to be developed and provisions for independent scientific input/review.

22. An extended schedule for developing the Biological Opinions would allow time during which new scientific methodologies proposed under BDCP, and perhaps any monitoring data obtained after it is approved, could be considered and incorporated in the remanded Biological Opinions. The subject matter of these documents is complex and controversial. Extending the time to develop the salmonid and smelt BiOps while the BDCP is being completed will provide time to better develop scientifically robust and consistent documents.

23. This declaration is based upon my personal knowledge and if called as a witness I could and would testify consistently with this declaration.

I declare under penalty of perjury that the foregoing is true and correct, and that this declaration is executed this 15th day of March, 2013 at Sacramento, California.

Dale K. Hoffman-Floerke

DALE HOFFMAN-FLOERKE

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