

1 **COUNSEL IDENTIFICATION ON FINAL PAGE**

2 **UNITED STATES DISTRICT COURT**  
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4 **EASTERN DISTRICT OF CALIFORNIA**

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8 **THE CONSOLIDATED DELTA SMELT**  
9 **CASES**

Lead Case:  
1:09-cv-407-LJO-BAM

Member Cases:  
1:09-cv-422-LJO-DLB  
1:09-cv-631-LJO-DLB  
1:09-cv-892-LJO-GSA

Partially Consolidated With:  
1:09-cv-480-LJO-GSA  
1:09-cv-1201-LJO-DLB

11 **STATUS REPORT AND REQUEST**  
12 **TO FURTHER EXTEND THE**  
13 **REMAND SCHEDULE**

14  
15  
16 **THE CONSOLIDATED SALMONID**  
17 **CASES**

Lead Case:  
1:09-cv-1053-LJO- BAM

Member Cases:  
1:09-cv-1090-LJO-DLB  
1:09-cv-1378-LJO-DLB  
1:09-cv-1520-LJO-DLB  
1:09-cv-1580-LJO-DLB  
1:09-cv-1625-LJO-SMS

19 **STATUS REPORT AND REQUEST**  
20 **TO FURTHER EXTEND THE**  
21 **REMAND SCHEDULE**

1 Pursuant to the Court’s Memorandum Decision and Order Regarding Motion to Extend  
2 Remand Schedule, Smelt Doc. No. 1106; Salmonid Doc. No. 739 (Apr. 9, 2013) (“Order”), the  
3 parties submit this status report on the Collaborative Science and Adaptive Management  
4 Program (“CSAMP”). Federal Defendants, along with Plaintiff-Intervenor California Department  
5 of Water Resources (“DWR”) (collectively “Movants”), also respectfully move the Court to  
6 further extend the respective remand schedules by an additional year.<sup>1</sup>

### 7 INTRODUCTION

8 The April 2013 Order granted an initial one-year extension of the existing remand  
9 deadlines in both cases to allow the parties to pursue the CSAMP, which the Court recognized  
10 anticipated a “level of collaboration ... much more intense and potentially far-reaching than any  
11 previously-described collaborative efforts.” Order at 8. The Order required the parties to submit  
12 a joint status report on or before February 15, 2014, extended to February 18, 2014, *Smelt* Doc.  
13 No. 1106; *Salmonid* Doc. No. 739, and stated that a one-year extension would be granted if  
14 “substantial progress” had been made along the lines outlined by Movants. Order at 15-16.

15 In requesting the original extension, Movants reported that there had been a significant  
16 breakthrough in the development of the Bay Delta Conservation Plan (“BDCP”), Hoffman-  
17 Floerke Decl., Smelt Doc. No. 1101-1, Salmon Doc. 731-1, at ¶ 2, and that the increasingly  
18 collaborative nature of discussions in connection with the BDCP had “spilled over” into  
19 discussions of the implementation of the U.S. Fish and Wildlife Service’s (“FWS”) 2008  
20 biological opinion (“Smelt BiOp”) reasonable and prudent alternative (“RPA”), and the 2009  
21 National Marine Fisheries Service (“NMFS”) biological opinion (“Salmon BiOp”) RPA. *Id.* at ¶  
22 3; *see also* Smelt Doc. 1101-5, Salmon Doc. 731-5, at ¶¶ 1, 3, 7; Smelt Doc. 1101-2, Salmon

23  
24 <sup>1</sup> On January 27, 2014, the Ninth Circuit Court of Appeals continued oral argument in the  
25 *Consolidated Salmonid Cases* from February 10, 2014 until September 2014, in light of its  
26 “anticipated opinion” in the *Consolidated Delta Smelt Cases* appeal, which was argued in  
27 September 2012. *San Luis & Delta-Mendota v. Locke*, Case No. 12-15144 (9th Cir. Jan. 27,  
28 2014), Doc. 125. The Ninth Circuit’s “anticipated opinion,” might affect in some way the  
remand schedule in the *Consolidated Delta Smelt Cases*. Accordingly, following issuance of  
that opinion, Federal Defendants will return to the Court for any appropriate adjustments.  
Because it is presently unknown when that opinion will be issued or what its effects might be,  
Federal Defendants join in this status report and ask the Court to grant another extension, for  
the reasons discussed herein.

1 Doc. 731-2, ¶¶ 4-6; Smelt Doc. 1101-3, Salmon Doc. 731-3, at ¶¶ 3, 25. At the management and  
2 biologist levels, state and federal agencies supported collaborative scientific efforts to achieve  
3 more protection for the fishery resources, as well as more efficient use of scarce water supplies.  
4 As a result, Movants opined, and the Court subsequently held, that there had been a genuine  
5 “paradigm shift,” which amounted to a change in circumstances that had not been anticipated at  
6 the time judgments in the cases were entered. Order at 8. Movants also described four categories  
7 of information that it intended to pursue through CSAMP: science regarding the fall outflow  
8 related to the fall X2 RPA action; studies of turbidity triggers which give warning of Delta Smelt  
9 presence near the Projects’ intake; development of life-cycle models for Delta Smelt and  
10 Chinook salmon; and further studies regarding salmonid survival. *See Hoffman-Floerke Decl.* at  
11 ¶¶ 6-14.

12 As Movants’ summarize herein, and as detailed in supporting declarations and exhibits,  
13 substantial progress has been made in developing and implementing CSAMP. And a roadmap,  
14 including schedules and proposed milestones, for near-, mid-, and long-term future CSAMP  
15 activities has been developed.<sup>2</sup> Scientific work related to fall X2, turbidity triggers, the  
16 development of life-cycle models, and understanding salmonid survival, has also advanced  
17 during this period. *See King Moon Decl.* ¶¶ 3-9; *see Lohofener Decl.* ¶¶ 12, 13. A further  
18 extension is warranted to allow this important scientific work to continue. Following Movants’  
19 summary, the remaining parties provide their views regarding the progress achieved to date, and  
20 on a further extension of the remand deadlines.

## 21 DISCUSSION

### 22 I. Movants’ Summary Of Progress And Future Steps<sup>3</sup>

23 The Order requires a status update in three basic areas: (1) progress made thus far in  
24 implementing the program; (2) the future direction of the program; and (3) how CSAMP results  
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26 <sup>2</sup> The schedule of some actions may have to be adjusted, because current drought conditions will  
27 likely preclude Reclamation and DWR from allowing any experiments for CSAMP that reduce  
water supply this year. Declaration of Paul Fujitani ¶ 8.

28 <sup>3</sup> Given time constraints, Movants have had no opportunity to review or respond to most of the  
separate positions of the parties.

1 may be incorporated into the Endangered Species Act (“ESA”) consultation processes. Order at  
2 15. As explained below, significant progress has been achieved to date, and the steps that will be  
3 taken in 2014 and beyond will help inform the ongoing ESA consultation processes by, among  
4 other things, providing stakeholders and Movants additional information from ongoing studies  
5 about the listed species, Rea Decl. ¶ 19; allowing stakeholders the opportunity for further  
6 collaboration in evaluating the available scientific information and opportunity for consensus in  
7 its application; and providing more time for the development of agreed-upon models for the  
8 consultation. These steps may help inform the ESA consultation process and improve the short  
9 and long-term protection of the listed species. And to the extent these steps result in consensus  
10 among some or all stakeholders, the results from this collaborative effort could help reduce the  
11 risk of continued or future litigation. *Id.* at 20.

12 **A. In The Past Year, Substantial Progress Has Been Made Related To CSAMP**  
13 **And Delta-Related Scientific Work.**

14 The CSAMP, as the Court recognized, is an unprecedented collaborative process  
15 involving a diverse group of private, State, Federal, and local agencies. To date, FWS staff alone  
16 has dedicated more than 1000 man hours to it. Lohofener Decl. ¶ 5. Progress has not come  
17 easy, as the four areas identified above are areas which have historically produced the most  
18 disagreement among the parties. Nonetheless, “excellent progress” has been made. *Id.* ¶ 7. The  
19 parties have agreed on foundational conceptual models, key questions, and with the exception of  
20 a few items as noted herein, priority workplans. *See id.*; Rea Decl. ¶¶ 5-8, 10. Completion of this  
21 research will require further extension of the remand schedule contemplated by this Court’s 2013  
22 order. Rea Decl. ¶¶ 9-10, 17.

23 Since the extension, a two-tiered organizational structure was established to implement  
24 CSAMP, including: (1) a Policy Group made up of agency directors and top-level executives  
25 from the entities involved the litigation; and (2) the Collaborative Adaptive Management Team  
26 (CAMT), made up of designated managers and senior scientists from a range of State, Federal,  
27 and local entities to serve as the working group under the direction of the Policy Group. Rea  
28 Decl. ¶ 3, Ex. A (Progress Report to the Collaborative Science Policy Group [“CSAMP Progress

1 Report”)] at ii, 1. The roles for each group have been defined, with the Policy Group focusing on  
2 functions like collaborating at the leadership level, resolving process issues, selecting CAMT  
3 members, and reviewing progress and proposing changes and improvements as needed. *Id.* at 60.  
4 The eleven-member CAMT, co-chaired by the Nature Conservancy and State and Federal  
5 Contractors Water Agency, is serving as the working group under the direction of the Policy  
6 Group. *Id.* at ii, 1.

7 As promised, CSAMP, through its CAMT, spent the year forming and developing key  
8 questions and experimental designs, which take the form of workplans in the CSAMP Progress  
9 Report. *Id.* at 10-31. CAMT has met regularly, established a mission statement to serve as the  
10 foundation of the CAMT process, and agreed to standards for meeting conduct including  
11 transparency, accessibility, honesty, timeliness, and open-mindedness, to help foster productive  
12 collaboration. *Id.* at 2; Lohofener Decl. ¶ 7. Additionally, as anticipated, the CAMT science  
13 process will be “broadly consistent with the adaptive management process described in the DOI  
14 [Department of Interior] Adaptive Management Technical Guide and the Delta Science Plan.”  
15 Rea Decl. ¶¶ 3-4, Ex. A at 5; Salmon Doc. 731-3 ¶ 11. Consistent with the first steps of that  
16 adaptive management process, CAMT has identified and agreed to focus on three priority areas:

- 17 1. Fall Outflow management for Delta Smelt
- 18 2. Old and Middle River (OMR) flow management and entrainment of Delta Smelt
- 19 3. South Delta salmon survival

20 Rea Decl. ¶ 3, Ex. A (CSAMP Progress Report) at 3-4. For each topic area, CAMT followed the  
21 standard steps of adaptive management by first articulating problem statements, including the  
22 identification of uncertainties and disagreements, then developing conceptual models, and  
23 formulating key questions and hypotheses. The comparison of different conceptual models has  
24 proven to be an effective method for shared learning and identifying areas of agreement and  
25 disagreement. *Id.* at 6. Based on this work, CAMT proposed “near-term priority work elements”  
26 within each priority area that would be particularly relevant and timely for addressing key  
27 questions and informing future consultation processes. *Id.* at 10. Workplans for the three priority  
28 areas, and a detailed schedule for each, are provided in the CSAMP Progress Report, and are

summarized briefly below.

**B. Schedules and Milestones For Future CSAMP Activities Have Been Developed But Are Dependent On Another Remand Extension.**

Generally, as CSAMP continues, CAMT will develop more detailed specification of questions, hypotheses, and conceptual models, potentially incorporating review by scientific experts. There was broad agreement within the CAMT that a successful long-term program of collaborative science and adaptive management requires a credible and legitimate framework and process that ensures broad-based acceptance and support for the science and decisions resulting from the process. Rea Decl. ¶ 3, Ex. A (CSAMP Progress Report) at 8. To that end, CAMT expects to initiate “Scoping Teams” that will coordinate with technical groups to ensure that products remain relevant to the CAMT scope and mission, assign specific scientific investigations to qualified technical experts, and establish a structured review process for study plans and work products. *Id.* at 10. Assuming CSAMP proceeds under another Court extension, as the CSAMP Progress Report does for scheduling purposes, CAMT set forth a detailed schedule for these tasks, as well as milestones for this phase of CSAMP. *Id.* at 10-31.

CAMT also proposes to draw upon the resources of the Delta Science Program (“DSP”) and the mechanisms outlined in the Delta Science Plan to facilitate implementation of the work plans. Specifically, the DSP would: (a) provide guidance on scientific methods and best practices and ensure consistency with the Delta Science Plan, (b) help identify technical experts that would design and carry out the scientific investigations called for in the CAMT work plan and synthesize results, (c) help the CAMT identify any additional subject-related expertise that would assist with scoping and coordination tasks, and (d) manage and implement all independent review of CAMT science proposals, study plans, and results. *Id.* at 11. Additionally, to assure relevance and credibility, CSAMP anticipates that all CAMT studies will be designed and implemented according to scientific principles in the Delta Science Plan, including: (i) well-stated goals and objectives; (ii) a statement of relevance to the CAMT priority work elements; (iii) clear conceptual and/or mathematical model(s); (iv) questions and hypotheses that are clearly linked to the conceptual or mathematical model(s); (v) a study design capable of

1 addressing the questions with sufficient precision and accuracy and with standardized, well-  
2 documented methods for data collection; (vi) analytical rigor and sound logic for analysis and  
3 interpretation; (vii) clear documentation of methods, results, and conclusions; and  
4 (viii) publication of results in peer-reviewed scientific journals or reports. *Id.* at 12.

5 As noted above, the workplans for the three priority areas are summarized below.

6 **1. Progress Has Been Made To Date On Each Priority Area and Future**  
7 **Schedules For Each Have Been Established.**

8 **a. Fall Outflow Management and Entrainment for Smelt**

9 The priority topic “Fall Outflow Management for Smelt” addresses the Smelt BiOp’s fall  
10 X2 RPA action (Action 4). Implementation of this action was the subject of disagreement during  
11 the litigation. It requires that the “low salinity zone” be maintained at a certain geographic  
12 location downstream (74 kilometers from the Golden Gate Bridge following a “wet” year and at  
13 81 kilometers east following “above normal” years) during September and October.

14 The workplan for this topic includes three high-priority questions with schedules, and  
15 several other questions that will be pursued as resources and time permit. For example, the  
16 workplan includes: schedules for separate reports on Delta Smelt survey data, available life-  
17 cycle models, and fall outflow and Delta Smelt abundance; it calls for a study plan on outflow  
18 and Delta Smelt growth and survival; an evaluation of existing data comparing Delta Smelt  
19 survival during the fall to survival in prior seasons and to fork length at the end of the summer  
20 and start of the fall; and variability in tidal, daily, weekly, and monthly fluctuations in fall X2 as  
21 related to water project operations. As resources allow, CSAMP will develop a new or updated  
22 habitat index based on those habitat attributes that affect growth and survival during the fall, and,  
23 based on the results of all of the above, contribute new information on the impacts of project  
24 operations during the fall on the survival of Delta Smelt. Specific analyses and experiments  
25 designed to address this priority area are detailed in Table 3-1 of the CSAMP Progress Report,  
26 Rea Decl. ¶ 3, Ex. A at 13-18, which is attached in full at Attachment 1.

27 **b. OMR Management for Delta Smelt**

28 This priority topic area will study environmental factors that relate to Delta Smelt

1 entrainment, such as turbidity triggers mentioned in the original moving papers. In brief, the  
2 Delta Smelt BiOp RPA actions that are focused on entrainment are intended to limit Delta Smelt  
3 entrainment primarily through reductions on negative flows in Old and Middle Rivers (OMR  
4 flow), which can have the effect of reducing project pumping in the south Delta. It has recently  
5 been hypothesized by some scientists that Delta Smelt can sometimes be induced to avoid the  
6 project pumps altogether by a combination of “preventative” management actions that affect  
7 OMR flow and the turbidity plume that appears to trigger Delta Smelt upstream movement. Rea  
8 Decl. ¶ 3, Ex. A (CSAMP Progress Report) at 47. If such preventative management actions  
9 prove to be feasible, they may, in some years, allow for equal or better entrainment protection for  
10 Delta Smelt while allowing for greater project pumping during the winter and spring.

11 CSAMP has developed a workplan to assess factors affecting adult Delta Smelt  
12 entrainment, including, completion of First Flush Study analyses. Among other things, the Delta  
13 Conditions Team (“DCT”), which was not formed or directed by CAMT, but includes  
14 representatives of the Metropolitan Water District (“MWD”), the National Oceanic and  
15 Atmospheric Administration (“NOAA”), FWS, California Department of Fish and Wildlife  
16 (“CDFW”), DWR, the U.S. Bureau of Reclamation, Contra Costa Water District, and others, is  
17 currently developing a scope of work to use turbidity modeling to examine various “first flush”  
18 conditions, expected entrainment risks, and potential preventative actions that could be taken to  
19 reduce entrainment. CSAMP anticipates having a detailed workplan related to the effects of  
20 entrainment on the Delta Smelt population in April 2014, with an independent review of that  
21 plan in November 2014. A final peer reviewed product for a life-cycle model approach is  
22 expected to be available June 2015. Other workplans to develop better estimates of post-larval  
23 and adult entrainment, and conditions that affect adult movement prior to spawning may be  
24 explored, as resources allow. The specific analyses and experiments designed to address this  
25 priority area are detailed in Table 3-2 of the CSAMP Progress Report, Rea Decl. ¶ 3, Ex. A at  
26 19-23, which is attached in full at Attachment 1.

27 **c. South Delta Salmonid Survival**

28 The priority topic area of “South Delta Salmonid Survival” is intended to further the

understanding of salmonid survival in the south Delta. While the South Delta Salmonid Research Collaborative (“SDSRC”) was not formed, or directed by CAMT, CAMT has “looked to the work of the SDSRC to inform the development of its workplan.” Rea Decl. ¶ 3, Ex. A at 58. As discussed below, CSAMP and the Court’s extension of the remand schedule have allowed the SDSRC to engage in very productive discussions regarding salmonid survival in the south Delta and its relationship to project operations. Rea Decl. ¶¶ 6-8. A detailed description of the work performed by the SDSRC, including the technical products it has produced, is incorporated in the annual progress report to CSAMP Progress Report, and the full SDSRC Progress Report is Attachment A thereto. *See* Rea Decl. at ¶ 8, Ex. B (SDSRC Progress Report).

In brief, NMFS and DWR jointly established the SDSRC with input and participation from the U.S. Bureau of Reclamation, FWS, California Department of Fish and Wildlife, the Delta Stewardship Council, and Plaintiffs State Water Contractors and Westlands Water District, as an outgrowth of the 2012 Joint Stipulation for Central Valley Project (“CVP”)/State Water Project (“SWP”) operations. *Consolidated Salmonid Cases*, U.S. District Court for the Eastern District of California, Case No. 1:09-CV-01053 LJO-DLB (Doc. 660). Since late January 2013, the SDSRC (or its technical working group) has been meeting to explore research opportunities that would reduce the scientific uncertainties about the effects of San Joaquin River inflow and SWP and CVP water exports on south Delta hydrodynamics, and the effects of hydrodynamics on factors affecting migration behavior and survival of juvenile salmonids. Rea Decl. ¶ 6. The full SDSRC has convened on five occasions—a first kickoff meeting followed by four meetings at which the SDSRC Science Working Group provided briefings on its progress, challenges, next steps, and necessary decisions made by managers. Rea Decl. ¶ 6. The Science Working Group has convened eleven times in the past year, and its representatives have twice briefed the CAMT during this period on its progress. Rea Decl. ¶ 6.

The yearlong SDSRC collaboration among technical representatives has resulted in the development of a series of technical products, including: (i) a conceptual model of south Delta salmonid migrational survival; (ii) an analysis of the statistical power for a one-year through-Delta survival study of steelhead and fall-run Chinook salmon; (iii) identification of potential

1 effect size differences that may be important biologically for the purposes of experimental  
2 design development and scientific inquiry; (iv) fourteen hypothesis-based concept proposals for  
3 research improving the understanding of south Delta salmonid survival; (v) guidelines for  
4 concept proposal evaluation; (vi) a review of the ongoing 6-year steelhead study (Salmon BiOp  
5 RPA IV.2.2), to include identification of inflow-export conditions that have not yet been tested;  
6 (vi) identification of opportunities and constraints to enhance learning from the 6-year steelhead  
7 study in 2014; and (vii) identification of a new “Desktop Survival Study” for implementation as  
8 early as 2014 that includes additional analysis or meta-analysis of data from previously  
9 conducted studies of the survival and movement of tagged salmonids. *See* Rea Decl. ¶¶ 7, 8, Ex.  
10 B at 24.

11 The CSAMP workplan incorporates the work of the SDSRC. In brief, a re-chartered  
12 SDSRC that will report to CAMT intends to: revise and agree on a written proposal of data  
13 synthesis and meta-analysis of existing data from previous Delta salmonid tagging studies to  
14 address uncertainties about the ecological effects of exports on salmonid survival by April 2014;  
15 issue a progress report in March 2015; and issue a draft report by 2015, followed by a manuscript  
16 for publication. A related effort of the SDSRC will be to convene a series of working sessions to  
17 potentially refine the SDSRC conceptual model and formally screen published reports and data  
18 to identify key information gaps in the context of a conceptual model. Draft and final reports are  
19 expected in September and November, 2014, respectively. Pending results of the information gap  
20 analysis and initial data synthesis efforts, a working group will investigate alternative metrics for  
21 management of south Delta water operations. A status check of the working group will be  
22 prepared in June 2014, and the working group will prepare a progress report by November 2014.  
23 By March 2014, CSAMP will have conducted a working session to agree on an expanded scope  
24 to focus more broadly on indirect ecological effects of water export and management actions to  
25 minimize the effects that influence salmonid survival. SDSRC has also been reviewing the 6-  
26 year steelhead study (Salmon BiOp RPA action IV.2.2) to determine whether experimental  
27 modifications are warranted. *See* Rea Decl. ¶ 8, Ex. B at 5, 24. The first three years of testing  
28 have identified several conditions that are underrepresented. *Id.* at 17. The SDSRC had been

planning on manipulating operations in the spring of this year. However, the drought will make this challenging. *See* Fujitani Decl. ¶ 8. CAMT will identify options, develop implementation plans, and prepare a request for prescribed conditions no later than June 2014. Implementation is expected to occur in 2015 or later, depending on environmental conditions. The specific analyses and experiments designed to address the priority topic of “South Delta Salmonid Survival” are detailed in Table 3-3 of the CSAMP Progress Report, Rea Decl. ¶ 3, Ex. A at 24-30, which is attached in full at Attachment 1.

**d. Development of Life-Cycle Models for Delta Smelt and Salmonids**

This Court and independent scientific reviews of Delta water management actions have called for the development and use of “lifecycle models.” *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 investigators to integrate multiple effects occurring at different times over the full life-cycle, potentially enabling investigators to estimate and parse out population level effects of conservation measures or water operations management strategies. For Delta Smelt, which typically live only one year, a life-cycle model could predict the effects of taking action in different months or seasons of the year depending on which developmental stage of the fish is present at that time. Multiple, separate efforts are underway to develop a Delta Smelt life-cycle model, including a model that has been in development by Ken Newman (FWS) for more than two years. For salmonids, a life-cycle model could be relevant to examining the role hydrodynamics and water quality (which may be affected by river flows, SWP and CVP exports, OMR reverse flows, Delta inflow and outflow, tidal hydrodynamics and hydrologic conditions overall) as factors affecting the probability that salmon will survive through the different stages of their life cycle. Rea Decl. ¶ 3, Ex. A at 79. NMFS is in the process of developing a life-cycle model for winter-run Chinook salmon which may also benefit from stakeholder input through CSAMP. *See* Rea Decl. ¶ 20.

The CSAMP anticipated establishing a modeling group, which could serve as a forum for exchange of information about the development, structure and use of life-cycle models for both

Delta Smelt and salmonids, with the objective of transparency. King Moon Decl. ¶ 9. Delta Smelt life-cycle model information from the Interagency Ecological Program (“IEP”), undertaken by Ken Newman (FWS), would build a life-cycle model combining the current knowledge of the species life history with the extensive trawl survey data on distribution and abundance of Delta Smelt. Lohofener Decl. ¶ 15. Phase 1 of this effort will develop a life history model for Delta Smelt, and Phase 2 will either develop multiple single species life history models for one or more fish species, or a single integrated multi- species life history model. A presentation of Dr. Newman’s Delta Smelt life-cycle model work was given to the IEP in May 2013. *Id.* The model reached a milestone state of development and a first publication is in preparation. In addition, FWS has hired a PhD graduate Leo Polansky, for a minimum of two years, to provide technical assistance with ongoing preliminary exploratory data analysis, state-space model formulation, and model fitting. *Id.* Also in May 2013, Dr. Newman began collaborative work with David Fullerton (MWD) and Mark Maunder (Inter-American Tropical Tuna Commission), with the latter providing technical assistance with model fitting using AD Model Builder. *Id.*

A briefing about the status of the Southwest Fisheries Science Center (“SWFSC”) winter-run salmonid life-cycle model and its specific components will be provided to CAMT and interested parties by April 2014. Rea Decl. ¶ 3, Ex. A at 25 (Table 3-3, element 2). Thereafter, CAMT will assess other potential modeling needs. CAMT will discuss the SWFSC winter-run salmonid life-cycle model, its potential limitations, and whether there are elements of other salmon models that would be beneficial to incorporate or link to the winter-run Chinook model. Pending acquisition of new resources, CAMT will update the status of this review in September 2014, and complete a preliminary analysis and write up by November 2014. *Id.* at 27 (Table 3-3, element 7).

### **C. Conclusion**

CSAMP is up and running, and proceeding toward the collaborative scientific progress envisioned by Movants. Likewise, other previously described Delta scientific efforts have also advanced during this first extension. A further extension is necessary and warranted to allow this

important scientific work to proceed and to accomplish CSAMP's mission of creating robust and collaborative science.

**II. Positions Of Remaining Parties Regarding Progress and Extension of Remand Deadlines<sup>4</sup>**

No Plaintiff opposes the above-requested extension. Plaintiffs add their separate position statements below. Defendant-Intervenors request a six-month extension, rather than another yearlong extension, for the reasons discussed below.

**A. Plaintiffs San Luis & Delta-Mendota Water Authority, Westlands Water District, Family Farm Alliance, Stewart & Jasper Orchards, Arroyo Farms LLC, King Pistachio Orchard, Oakdale Irrigation District, South San Joaquin Irrigation District and Stockton East Water District.**

Plaintiffs San Luis & Delta-Mendota Water Authority, Westlands Water District, Family Farm Alliance, Stewart & Jasper Orchards, Arroyo Farms LLC, King Pistachio Orchard, Oakdale Irrigation District, South San Joaquin Irrigation District and Stockton East Water District support a further extension of the remand deadlines, in order to allow the CSAMP process to continue. There has been meaningful progress in the ten months since the Order. While the process has involved areas of disagreement, it has also resulted in areas of agreement, and continuing the process is preferable to the alternative of stopping the collaboration now. Stopping now would mean issuance of a final smelt biological opinion this year, without the benefit of the new information the process should yield regarding the priority areas listed above, including the X2 action and OMR restrictions. The work planned for 2014 and beyond should serve to better inform the consultations and improve the next set of smelt and salmon biological opinions. These plaintiffs believe these potential benefits are worth allowing more time for this process.

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<sup>4</sup> Given time constraints, neither Movants nor the parties have had time to review most of these separate positions or provide material responsive statements. To the extent the Court would like such statements, the parties will accommodate such request. In particular, Plaintiff-Intervenor DWR would appreciate the opportunity to comment on the benchmark conditions proposed in the Metropolitan Water District/State Water Contractors' statement. DWR also has not had the opportunity to review the Defendant-Intervenors' Environmental NGO statement in advance of this filing.

**B. State Contractor Plaintiffs**

**1. Introduction**

The Metropolitan Water District of Southern California and the State Water Contractors (collectively, “State Contractor Plaintiffs”) do not oppose the request of Federal Defendants and Plaintiff-Intervenor California Department of Water Resources (collectively, “Movants”) for a further extension of the respective remand schedules by an additional year, if the conditions outlined below are implemented going forward.

When the Collaborative Science and Adaptive Management Program (“CSAMP”) was first envisioned in November 2012, the State Contractor Plaintiffs cautiously shared Movants’ optimism that the program would indeed reflect a paradigm shift in the process by which the agencies and stakeholders plan to develop scientific information relevant to the remand process. As such, the State Contractor Plaintiffs did not oppose Movants’ first proposal for a remand extension. Smelt Doc. No. 1093; Smelt Doc. No. 1103.

The State Contractor Plaintiffs are not satisfied that CSAMP has achieved its potential. After nine months, the concerns expressed by the Court in the Memorandum Decision and Order Regarding Motion to Extend Remand Schedule, Smelt Doc. No. 1106; Salmonid Doc. No. 739 (“Order”) have proven to be prescient. In response to Movants’ proposal for the CSAMP process, the Court stated that, “[t]his lack of detail provides the Court with little assurance that CSAMP will proceed as envisioned, let alone that CSAMP will actually result in scientific progress, as opposed to ‘collaborative’ gridlock.” Order at 15:9-11. The lack of any measurable goals or concrete action items for the program led the Court to decide that, “rather than granting Movants a three-year blank check, during which time CSAMP could stagnate or entirely fall apart, the Court will grant a staged extension as described below.” Order at 15:11-13. Although the workplans developed this past year represent progress, there is a need for clear benchmarks to ensure that the collaborative process does not languish. The State Contractor Plaintiffs now respectfully ask the Court to withhold granting Movants a blank check for the coming year, and instead to incorporate benchmarks for the CSAMP process going forward.

## 2. CSAMP Goals For 2013

The overall goal of CSAMP was to develop a robust science and adaptive management program that would inform implementation of the existing Reasonable and Prudent Alternatives (“RPAs”) and improve the next Biological Opinions (“BiOps”). *See* Lohoefer Supp. Dec. Att. 1, Smelt Doc. No. 1101-2 at 2. Key milestones for 2013 included reaching mutual agreement on the hypotheses to be studied, synthesis of existing information and identification of information gaps, and “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” which would be ready for implementation by mid-2014. *Second Hoffman-Floerke Dec.*, Smelt Doc. No. 1101-1 ¶ 20; *see also* Lohoefer Supp. Dec. ¶ 25; *Rea Dec.*, Smelt Doc. No. 1101-3 ¶ 22. After nine months, these goals are still in the preliminary “study and discuss” stage, with no indication of how new research will be incorporated into the BiOps. Progress in priority topic areas is reviewed briefly below.

**OMR/Entrainment.** The agencies proposed a CSAMP working group that would collaborate with others on the development of life-cycle models, develop common data sets and assumptions to use in the models, and evaluate the population level effects of various stressors. *Second Hoffman-Floerke Dec.* ¶ 11; *see also* Lohoefer Supp. Dec. ¶ 16. CSAMP would also yield “better tools to predict turbidity movement” and coordinate multi-party research on the turbidity trigger issue that would be incorporated into the reconsultation process. *Second Hoffman-Floerke Dec.* ¶¶ 8-9. Thus far, CSAMP has not contributed to the development of any mutually agreed-upon life-cycle models for delta smelt or salmonids. *Progress Report to the Collaborative Science Policy Group prepared by the Collaborative Adaptive Management Team (“CAMT”)* (Feb. 14, 2014) (“Progress Report”) at 45. Recent conceptual models are currently being utilized as “tools to identify uncertainties and disagreements” and to formulate additional questions and hypotheses, rather than to generate new quantitative data for the BiOps. *Id.* The Progress Report emphasizes that the conceptual models require substantial additional refinement and “should not be taken as a sign of agreement of all [CAMT] group members . . . .” *Id.* According to the OMR/Entrainment Workplan, turbidity research is still in the scope of work

1 stage. *Id.* at 19.

2 **Fall Outflow Management for Delta Smelt.** The agencies proposed that CSAMP  
3 would generate data for the reconsultation process through “the development of quantitative  
4 estimates of delta smelt abundance, survival, growth and reproductive success as a function of  
5 salinity and habitat use, and assessment of the importance of additional environmental factors  
6 such as zooplankton availability, water velocities, nutrients, competition with other species and  
7 predation.” Second Hoffman-Floerke Dec. ¶ 7. According to the Fall Outflow Workplan,  
8 investigation of the effects of fall outflow on delta smelt is still in the “Study plan development”  
9 stage. Progress Report at 14.

10 **South Delta Salmonid Survival.** The agencies proposed that the South Delta Salmonid  
11 Research Collaborative (“SDSRC”) would develop conceptual models and draft testable  
12 hypotheses in 2013, with study plan implementation in 2014. Schiewe Dec., Smelt Doc. No.  
13 1101-4 ¶ 12. “This measured approach, which would be overseen and synthesized with other  
14 research through the CSAMP, is highly likely to yield vital information needed to support a new  
15 or revised Biological Opinion.” *Id.* ¶ 10. According to the South Delta Salmonid Survival  
16 Workplan, these efforts appear to be at least a year behind schedule. Progress Report at 24-26.

17 **Annual Operational Plan.** The agencies also did not adopt an annual operational plan  
18 for 2013 by the promised date of December 15. *See* Lohofner Supp. Dec. Att 1 at 2.

### 19 **3. Proposed CSAMP Benchmarks For 2014**

20 The State Contractor Plaintiffs propose the following benchmarks and action items to  
21 ensure that the CSAMP process will be successful going forward. These steps would reflect the  
22 kind of meaningful collaboration and robust science that were originally envisioned for CSAMP  
23 and for the development of new BiOps, but which have not yet come to fruition.

24 **Six Month Progress Reports.** The parties should be required to submit a joint status  
25 report on the progress of CSAMP and the benchmarks described below at six month intervals.  
26 Such reports have been effectively implemented in other cases to enable general court  
27 supervision over the remand process. *See, e.g., Nat’l Wildlife Fed’n v. NMFS*, No. CV 3:01-640-

RE (D. Or. Oct. 7, 2005) (opinion and order of remand).<sup>5</sup>

**Life-cycle model Working Group.** By August 1, CAMT should be required to convene a multi-party working group of representatives drawn from parties to the litigation or their designees to develop life-cycle models for delta smelt and salmonids and/or to review and comment on models being developed outside of CAMT. That working group would allow all of the representatives to engage in the sharing of existing work, discuss improvements that may be made, and provide for a collaborative exchange on the functionality, capability, limitations and utility of the models.

**Turbidity Research.** By August 1, CAMT should be required to finalize a study plan for new turbidity research with a specific description, including the steps to be taken and the schedule for those actions, identifying how that research will be integrated into decision-making with respect to interim operations and the reconsultation process.

**Development of New BiOps.** In each six month progress report to the court, the parties should be required to describe how the research, modeling, and other work completed at that point will be incorporated into the reconsultation process along with a schedule of action items and proposed milestone dates for the structured development of new BiOps. In addition, by August 1, the United States Fish and Wildlife Service and National Marine Fisheries Service should be required to collaborate with the other parties to the litigation to devise a structured approach for the development of new BiOps, including an effects analysis that draws upon the best available scientific information.

**Annual Operational Plan.** By August 1, CAMT should convene a working group to begin work on the Annual Operational Plan for the following year.

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<sup>5</sup> In that litigation, Judge Redden ordered that “NOAA shall file detailed written status reports regarding progress made on remand every 90 days, beginning on January 2, 2006. Any party or amici shall have 5 days to comment on the status reports. The court will hold status conferences approximately 5 days after comments are filed. The comments shall be 2 pages or less in length and shall be designed not for the purpose of objecting to NOAA’s reports, but rather to assist the court, the parties, and amici in narrowing the issues to be addressed during the status conferences. NOAA’s first status report shall include, at a minimum, preliminary information from which the court, the parties, and amici are able to gain some understanding of (1) the legal framework NOAA intends to use in its jeopardy analysis, (2) the nature and scope of any proposed agency action and/or RPA, and (3) NOAA’s plan for collaboration with the sovereign entities.” *Id.* at 12.

#### **4. Science Investigations Outside Of CSAMP**

The State Contractor Plaintiffs believe there are important science investigations that were not included in the CSAMP process in 2013 for various reasons, including a claimed lack of resources or a difference of scientific opinion about their importance. These other science investigations, which are being conducted by the federal agencies, the public water agencies, and others, may be necessary or useful in developing robust BiOps and RPAs. This statement of non-opposition to the further extension of the remand period is not meant to indicate that the State Contractor Plaintiffs agree that CAMT should be considered the exclusive forum for studies that will inform the new BiOps. Rather, it is the State Contractor Plaintiffs' position that there may be other studies, including ones that the State Contractor Plaintiffs may pursue, that should also be considered as part of the section 7 consultation process. However, the aforementioned recommended benchmarks should assist in improving the CAMT process, so that it may achieve its intended goal of informing implementation of the RPAs and result in improved BiOps.

#### **5. Conclusion**

The State Contractor Plaintiffs are willing to support another year of CSAMP if specific benchmarks are incorporated going forward. With those conditions, the State Contractor Plaintiffs do not oppose Movants' request for a further extension of the remand period.

#### **C. Separate Statement of Kern County Water Agency and the Coalition for a Sustainable Delta**

During the past nine months, Plaintiffs Kern County Water Agency ("Kern") and the Coalition for a Sustainable Delta ("Coalition") have dedicated substantial resources to active participation in the Collaborative Science and Adaptive Management Program ("CSAMP"). Despite reservations, Kern and the Coalition engaged in the process in good faith in the hopes that the federal and state parties would live up to the commitments made and all parties to the process would work collaboratively to (i) assess the efficacy of existing and alternative management actions and operational strategies during the remand period and (ii) develop a structured decision-making process grounded in adaptive management to gather, critically assess,

and synthesize scientific information for the purpose of informing rigorous effects analyses and biological opinions.

The process to date has fallen short of our expectations. In our view, four key topics must be addressed in the coming months if the process is to be fruitful. We understand that all the parties agree that the Progress Report is a working document, and all parties intend to discuss further modification or refinement of the most recent additions to the Progress Report with the Collaborative Adaptive Management Team (“CAMT”) in the weeks following filing of this Joint Report with the Court.

First, **the federal agencies must commit the resources necessary to actively engage in and contribute to the process.** While the Fish and Wildlife Service has actively engaged in recent months, the failure of the National Marine Fisheries Service to dedicate sufficient resources to the process to date resulted in halting progress for periods of weeks or even months on some fronts. Because the federal agencies argue that a further extension is necessary in order that they can bring to bear the resources necessary to make this process a success, we expect that they will indeed bring such resources to bear at levels greater than was evident during the past year.

Second, **we are concerned about the limited role of Kern, the Coalition, and other interested parties in the process for conducting investigations and seeking independent review of the scientific products that result from those investigations.** Consistent with the spirit of the CSAMP, we contend that the stakeholder members of CAMT should have a prominent role in the process of scoping scientific investigations, ensuring appropriately qualified technical experts conduct such investigations, and establishing the process to review the products of those investigations. Such investigations, to be effective, also must include an articulation of the task; a critical review and assessment of the available empirical research and associated findings, as relevant; a description of the methods and data used; the results obtained, a discussion of the robustness of the results, including limitations of the data and methods used; sources of uncertainty; and, to the extent applicable, disagreements among the authors regarding the methods, data, and/or results. While the process proposed in the Progress Report adequately

1 addresses some of these requirements, finalizing this process, forming the science work groups,  
2 and initiating work identified in the work plans within the next 60 days is imperative to  
3 completing high priority tasks in 2014.

4 Third, the Progress Report does not set out, or describe a process to set out, a structured  
5 approach to the development of a new biological assessment (“BA”) by the Bureau of  
6 Reclamation and new biological opinions (“BiOps”) by the Fish and Wildlife Service and  
7 National Marine Fisheries Service. While the consultation regulations (50 C.F.R. pt. 402) and  
8 the Section 7 Consultation Handbook offer a general roadmap for completion of the effects  
9 analyses and biological opinions, **it is imperative for the parties to the CSAMP to devise a**  
10 **structured approach for development of a new BA and new BiOps** that will provide a  
11 roadmap whereby scientific data, analyses, and findings that emerge from the collaborative,  
12 adaptive management process are integrated into the process of determining whether continuing  
13 operations of the Central Valley Project and State Water Project are likely to jeopardize the  
14 continued existing of listed species and/or result in destruction or adverse modification of  
15 designated critical habitat of such species and developing incidental take statements applicable to  
16 the Central Valley Project and State Water Project.

17 Fourth, **the federal and state agencies must abide by the commitments made to this**  
18 **Court and the parties regarding deadlines and collaborative development of documents**  
19 **and plans.** In 2013, the federal and state agencies failed to work collaboratively with the CAMT  
20 to develop an annual operational plan despite making an express commitment to do so by  
21 December 15, in multiple court filings (*e.g.*, Doc. 713-1, Dec. 20, 2012, Doc. 1101-2, March 15,  
22 2013). This Court should clarify that such commitments are binding.

23 Despite significant reservations, Kern and the Coalition continue to see the promise that  
24 the CSAMP holds for more open and effective resource management in the future. As a  
25 consequence, we are prepared to invest our hope and our resources in the process for an  
26 additional year with the understanding that the above shortcomings will be addressed. At the  
27 same time, we join in and support the statement of State Contractor Plaintiffs. Subject to the  
28 foregoing, Kern and the Coalition do not oppose the one-year extension of time being sought by

1 Movants.

2 **D. Defendant-Intervenors' Position**

3 Over the past year, several representatives of Defendant-Intervenor organizations have  
4 participated in both the Collaborative Science and Adaptive Management Program (CSAMP)  
5 and Collaborative Adaptive Management Team (CAMT). We agree with several parties that  
6 these forums have provided a useful locus for discussing disagreements among some parties.  
7 However, it is clear that considerable differences of opinion remain about not only underlying  
8 scientific approaches and conclusions, but about the purpose and scope of the CSAMP and  
9 CAMT. Those differences have not been resolved in the last year, casting considerable  
10 uncertainty over the ultimate success of this effort.

11 For example, a statement circulated by Kern County Water Agency and the Coalition for  
12 a Sustainable Delta makes several assertions about the process with which Defendant-  
13 Intervenors strongly disagree, which disagreement has been repeatedly expressed in CSAMP and  
14 CAMT meetings. Perhaps most importantly, this process is not and cannot be a substitute for the  
15 agencies' performing their independent obligations under section 7 of the Endangered Species  
16 Act nor obligate the agencies to incorporate any findings that emerge from CSAMP into their  
17 legal determination whether continuing Central Valley Project- State Water Project operations  
18 are likely to jeopardize the continued existence of listed fish species or result in the destruction  
19 or adverse modification of their critical habitat. Indeed, if whatever emerges from this process  
20 fails to represent the best available science, then it would be a violation of the agencies'  
21 obligations to rely upon it. Moreover, the desire of some of the plaintiffs to give the stakeholder  
22 members of CAMT a prominent role in scientific design and review of CSAMP, rather than  
23 ensuring the input of qualified independent experts, makes it unlikely that the process will yield  
24 the best available science.

25 Nevertheless, Defendant-Intervenors intend to continue to participate in the CSAMP and  
26 CAMT to the extent that resources allow. However, Defendant-Intervenors believe that a shorter  
27 extension than one year is appropriate at this time, both because of the ongoing uncertainties  
28 surrounding CSAMT and CAMT and because of the recent notice from the Ninth Circuit Court

1 of Appeals indicating that an opinion is “anticipated” in the cross-appeals concerning the 2008  
2 delta smelt biological opinion. *San Luis & Delta-Mendota v. Locke*, Case No. 12-15144 (9th Cir.  
3 Jan. 27, 2014), ECF No. 125. That opinion will inevitably have an impact on the remand – its  
4 scope and timing. The parties and the Court will be better able to assess the appropriateness of a  
5 revised remand deadline after seeing that opinion. Therefore, Defendant-Intervenors request that  
6 the Court extend the existing remand deadlines by six months and direct the parties to file  
7 updated status reports within one week of the Ninth Circuit ruling, or within three months of this  
8 filing, whichever is sooner.

9 Dated: February 18, 2014

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**[MOVANTS' PROPOSED] ORDER**

Good cause appearing, and based on the stipulation of the parties, the court hereby orders as follows:

1. IT IS HEREBY ORDERED ADJUDGED, AND DECREED, that all deadlines in both the *Smelt* and *Salmonid* cases are extended by one year from the date of this order. On or before [date one year from entry of order], 2015, the parties shall submit a joint status report to the Court detailing progress that has been made in connection with the CSAMP as well as providing additional information about CSAMP's future activities and how any results will be incorporated into the consultation processes. As part of any such submission, the Court expects to see detailed schedules describing how CSAMP and the consultation processes in both cases will proceed. Concurrent with the filing of the joint status report, the Court will entertain a request to extend the remand schedule by an additional year, with the understanding that if substantial progress has been made along the lines outlined by Movants, such an extension will be granted.

**IT IS SO ORDERED.**

Dated: \_\_\_\_\_

\_\_\_\_\_  
UNITED STATES DISTRICT JUDGE

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**CERTIFICATE OF SERVICE**

I hereby certify that on February 18, 2014, I filed a true and correct copy of the foregoing document with the Court's CM/ECF system, which will generate a Notice of Filing to all attorneys of record, including the following:

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14 *Robert P. Williams, Trial Attorney*  
15 *Consolidated Delta Smelt Cases*

## ATTACHMENT 1

Table 3--1 CAMT Fall Outflow Workplan

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>High Priority Items</b>					
1. Review monitoring methods for delta smelt	Are there biases in the IEP survey data? How should the survey data be utilized if biases do exist?	NA	Investigate and clarify characteristics of existing monitoring data sets, including potential weaknesses in spatial coverage and other details of study design. Clarification of weaknesses will help ensure that analyses based on these datasets are appropriately qualified. Could allow for corrections (or adjustments) to more accurately represent underlying variables. Findings may suggest that results of previous studies should be reviewed. Findings may also allow for improvements in future data collection.	Convene a workshop to discuss possible survey problems and identify opportunities to address in 2014 with existing data. Consider ongoing work and approaches of Emilio Laca. Many of these issues have been proposed by FWS to be addressed through a package of gear efficiency and smelt distribution studies (see Section 5); however, that package includes extensive field work, and some elements have timelines extending beyond the remand period.	Discuss at IEP Resident fishes PWT meeting on Feb 20, 2014  Workshop (discuss E. Laca study plan) April 2014  Finalize study plan – May 2014  Gear efficiency study discussions June 2014  Draft report Sept 2014  IEP Presentation Feb 2015

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>High Priority Items</b>					
2. Investigate importance of fall period for delta smelt.	Under what circumstances does survival in the fall affect subsequent winter abundance?	Survival of delta smelt during the fall varies significantly from year to year and is important in explaining the annual changes in abundance.	Needed to establish whether survivorship through the fall is important in influencing year-to-year changes in delta smelt abundance.  Survivorship through the fall is one vital rate that may be important.	Quantitatively determine the contribution of delta smelt survivorship in the fall to inter-annual population variability. Review available lifecycle models for applicability.	Scoping group to evaluate available life cycle models July 2014 Study plan Dec 2014.  Draft report April 2015
3. Investigate effects of fall outflow on delta smelt.	Under what circumstances do environmental conditions in the fall season contribute to determining the subsequent abundance of delta smelt?	A significant correlation exists between the survival of delta smelt from summer to winter in a year and habitat conditions in the fall.	This element re-examines analyses presented in the 2008 BiOp. New work would include review of new information as it applies to the original analyses, and complement or challenge existing analyses to evaluate the relationship between outflow through the Delta and demographic response in delta smelt.	Investigate the relationship between fall outflow and the relative change in delta smelt abundance using univariate and multivariate and available historic data. Related to work undertaken in the MAST report, which examined pairs of dry and wet years in 2005/6 and 2010/11.  Also explore effects occurring through other avenues (e.g. growth or fecundity).	Study plan development June 2014  Draft report Nov 2014

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priorities</b>					
4. Examine project impacts on fall outflow.	How much variability in tidal, daily, weekly, and monthly fluctuations in fall X2 is attributable to water project operations?	Changes over time in the distribution and extent of habitat, as represented by the distribution and extent of the low-salinity zone (or the position of the X2 isohaline) during the fall is attributable to water export project operations.	The intent is to refine our understanding of how project operations are influencing outflow volumes.	Hydrological modeling tools to determine the prospective locations of X2 in the fall under circumstances with and without project operations. An analysis of historical data will also be carried out to examine outflow during periods when the projects were required to meet specific outflow requirements, to evaluate the degree of control that has been possible at various time scales. See work addressing this issue by: Grossinger, Hutton, and a paper by Cloern & Jassby 2012	Relevant IEP presentation by Paul Hutton, MWD – Feb 26, 2014

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priorities</b>					
5. Investigate importance of summer period for Delta Smelt	Under what circumstances is survival of Delta Smelt through the fall related to survival or growth rates in previous life stages?	Survival of Delta Smelt through the fall is related to survival or growth rates in previous life stages.	This topic complements some of the investigations in the FOAMP. By establishing whether survival or growth rates through any life stage (or season) are dependent on the status or condition of Delta Smelt entering that life stage, the potential exists to identify environmental factors in preceding seasons that influence survival during the fall.	Compare Delta Smelt survival during the fall to both survival in prior seasons and to fork length at the end of the summer/start of the fall. New data is being collected as part of FOAMP. Consider IBM modeling.	Draft study plan – Oct 2014  Analysis of existing data – mid 2015

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priorities</b>					
6. Investigate the relationship between fall outflow and habitat attributes.	Does outflow during the fall have significant effects on habitat attributes that may limit the survival and growth of Delta Smelt during the fall?	A significant relationship exists between the survival of Delta Smelt from summer to winter within a year and habitat conditions experienced by Delta Smelt during the intervening fall.	This element re-examines analyses presented in the 2008 BiOp. New work would include review of new information as it applies to the original analyses, and complement or challenge the existing work by developing new analyses to evaluate the strength of evidence for mechanisms under which outflow may influence Delta Smelt survivorship growth rates during the fall.	There may be competing approaches that will be simultaneously pursued. One is to develop graphs and conduct univariate and multivariate analyses involving survival ratios and growth rates. Test whether month-to-month declines in abundance or growth during the fall is greater when X2 is located further east. See also the analytical approach in MAST report, work by Kimmerer, Burnham & Manly.	Work may begin in 2014 as resources allow

Work Element	Key Question(s)	Example Draft Hypotheses	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priorities</b>					
7. Develop a new habitat index for Delta Smelt	Can an index based on multiple habitat attributes provide a better surrogate for Delta Smelt habitat than one based only on salinity and turbidity?	The distribution and areal extent of the low-salinity zone (or the position of the X2 isohaline) in the estuary in the autumn is significantly correlated with the distribution and extent of habitat available to support Delta Smelt.	<p>An updated habitat index may provide a useful tool to managers to identify areas for restoration and improved management actions.</p> <p>Earlier analyses used only abiotic factors to define habitat. Additional information since 2008, could allow for development of a better habitat index based on additional potentially important habitat variables.</p>	Review approaches in existing literature. There may be competing approaches that will be simultaneously pursued, depending on expert advice. One possible approach is to develop suitability index curves and combine geometrically to create a habitat quality index. Utilize data from areas where Delta Smelt are frequently observed to assess habitat quality. See work by Burnham Manly, and Guay.	Work may begin in 2014 as resources allow
8. Identify impacts of fall project operations on Delta Smelt	Under what conditions (e.g., distribution of the population, prey density, contaminants) do fall operations have significant effects on survival?		Complements and/or challenges previous studies. Important for identifying the impact of project operations on the success of Delta Smelt during the fall.	Utilizing relationships identified in the above studies, simulate how changes in project operations may influence survival of Delta Smelt during the fall.	Work may begin in 2014 as resources allow

**Table 3-2 CAMT OMR/Entrainment Workplan**

Work Element	Key Question(s)	Draft Example Hypotheses	Investigative Approaches	Schedule
<b>High Priority<sup>1</sup></b>				
1. Assess factors affecting adult Delta Smelt entrainment	What factors affect adult Delta Smelt entrainment during and after winter movements to spawning areas? (4) a. How should winter “first flush” be defined for the purposes of identifying entrainment risk and managing take of Delta Smelt at the south Delta facilities? b. What habitat conditions (e.g. first flush, turbidity, water source, food, time of year) lead to adult Delta Smelt entering and occupying the central and south Delta?	The probability of observing adult Delta Smelt in the central and south Delta is significantly higher following the first major increase in Delta inflow (e.g. >25,000 cfs), which contributes to rising turbidity levels in the central and south Delta.	Summarization of environmental and fish distribution/abundance data (e.g. FMWT, SKT). Multivariate analyses and modeling (e.g. 3D particle tracking) to examine whether fall conditions affect winter distribution. Completion of First Flush Study analyses. The Delta Conditions Team (DCT) is currently developing a scope of work to use turbidity modeling to examine various “first flush” conditions, expected entrainment risks, and potential preventative actions that could be taken to reduce entrainment, consistent with key question (a). The DCT could also conduct analyses to address key question (b).	Detailed workplan for key question (b) April 2014  Initial report on (a) for OCAP review panel Sept 2014  Independent review for key question (a) Nov 2014

<sup>1</sup> Work element #1 from the Fall Outflow Workplan is also considered a high priority work element for the OMR/Entrainment topic area.

Work Element	Key Question(s)	Draft Example Hypotheses	Investigative Approaches	Schedule
<b>High Priority</b>				
2. Assess population effects	What are the effects of entrainment on the population? (6) <ul style="list-style-type: none"> <li>a. What is the magnitude (e.g. % of population) of adult and larval entrainment across different years and environmental conditions?</li> <li>b. How do different levels of entrainment for adults and larvae affect population dynamics, abundance, and viability?</li> </ul>	Delta Smelt are entrained at Project facilities at levels that are likely to affect the long-term abundance of the Delta Smelt population.	2.a. Application of different models (e.g. IBM, life history) to estimate proportional entrainment. A direct approach to addressing 6a has been proposed by Kimmerer 2008 as modified in 2011. This or a derivative approach should be explored as a means to directly estimate the proportional entrainment that has occurred in recent years. Apply to as much of historical record as possible.  2.b. Application of different models (e.g. IBM, life history, PVA) to simulate effects on population dynamics, abundance, and variability.	Detailed workplan for direct approach April 2014  Product (based on direct approach) for submission to Long-term Ops Opinion panel Sept 2014  Independent review (Long-term Ops Opinion panel) Nov 2014  Final peer reviewed product for Life Cycle Model approach June 2015

Work Element	Key Question(s)	Draft Example Hypotheses	Investigative Approaches	Schedule
<b>Secondary Priorities</b>				
3. Develop a better estimate of adult Delta Smelt entrainment	How many <u>adult</u> Delta Smelt are entrained by the water projects? (1d)	NA	Workshop or expert panel review. Testing of new field methodologies such as SmeltCAM. Gear efficiency and expanded trawling experiments. Evaluation of alternative models to estimate abundance, distribution and entrainment.	Work may begin in 2014 as resources allow
4. Develop a better estimate of post-larval Delta Smelt entrainment	How many larval and <u>post-larval</u> Delta Smelt are entrained by the water projects? (2d)	NA	Expert panel or workshop review. Testing of new field methodologies such as SmeltCAM. Gear efficiency and expanded trawling experiments (e.g. 20 mm). Evaluation of alternative models to estimate abundance, distribution and entrainment.	Work may begin in 2014 as resources allow

Work Element	Key Question(s)	Draft Example Hypotheses	Investigative Approaches	Schedule
<b>Secondary Priorities</b>				
5. Evaluate conditions that affect adult movement prior to spawning	<p>What conditions prior to movement to spawning areas affect adult Delta Smelt entrainment? (3)</p> <p>Is there a relationship between Delta Smelt distribution and habitat conditions (e.g. turbidity, X2, temperature, food) during fall and subsequent distribution (and associated entrainment risk) in winter?</p>	<p>Adult Delta Smelt distribution and abundance in winter is influenced by Delta Smelt distribution and abundance in the fall, as well as habitat conditions (e.g. turbidity, salinity, temperature, food availability), and hydraulics (e.g. velocity, tidal flow splits) during winter.</p>	<p>Summarization of environmental and fish distribution/abundance data (e.g. FMWT, SKT). Multivariate analyses and modeling (e.g. 3D particle tracking) to examine whether fall conditions affect winter distribution. Completion of First Flush Study analyses.</p>	<p>Work may begin in 2014 as resources allow</p>
6. Assess factors affecting larval and post-larval Delta Smelt entrainment	<p>What factors affect larval and post-larval Delta Smelt entrainment? (5)</p> <p>a. How does adult spawning distribution affect larval and post-larval entrainment?</p> <p>b. What conditions (e.g. first flush, spawning distribution, turbidity, water source, food, time of year) lead to larvae and post-larvae occupying the central and south Delta?</p>	<p>Larval Delta Smelt distribution and abundance in spring is influenced by adult Delta Smelt distribution and abundance, habitat conditions (e.g. turbidity, salinity, temperature, food availability), and hydraulics (e.g. velocity, tidal flow splits).</p>	<p>Summarization of environmental and fish distribution/abundance data. Statistical analysis and modeling (e.g. 3D PTM) of effects adult distribution (e.g. SKT) on larval (e.g. 20 mm) distributions. Summarization of environmental and fish distribution/abundance data (e.g. 20 mm). Multivariate analyses/modeling to identify conditions promoting occupancy of central and south Delta.</p>	<p>Work may begin in 2014 as resources allow</p>

Work Element	Key Question(s)	Draft Example Hypotheses	Investigative Approaches	Schedule
<b>Secondary Priorities</b>				
<p>7. Explore alternative management actions</p>	<p>What new information would inform future consideration of management actions to optimize water project operations while ensuring adequate entrainment protection for Delta Smelt? (8)</p> <ul style="list-style-type: none"> <li>a. Can habitat conditions be managed during fall or early winter to prevent or mitigate significant entrainment events?</li> <li>b. Should habitat conditions (including OMR) be more aggressively managed in some circumstances as a preventative measure during the upstream movement period (e.g. following first flush) to reduce subsequent entrainment?</li> </ul>	<p>NA</p>	<p>Synthesis of available information and study results by CAMT Entrainment Team, designated expert panel, or both.</p> <p>Consultation with regulatory agencies and operators about the feasibility of different actions.</p>	<p>Work may begin in 2014 as resources allow</p>

**Table 3-3 CAMT South Delta Salmonid Survival Workplan**

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>High Priority: Expected for implementation in 2014</b>				
1. Synthesize published reports and empirical data on water export effects and link to the current SDSRC conceptual model; identify/document scientific agreements and disagreements regarding the effects of south Delta water operations on juvenile salmonid survival in the Delta.	What are key uncertainties, agreements, and disagreements in the understanding of direct and indirect effects of south Delta water operations on salmonid survival as linked to the SDSRC conceptual model? What are the areas/issues of scientific agreements and disagreements that contribute to the controversy over the effects of project operations on salmonid survival? Can the population level effects of a single management action be evaluated? If so, what tools are available?	Unfinished business of the SDSRC in 2013; identified as a priority for 2014 in the 2013 Progress Report. Potential opportunity to consider the PWA and other interests' questions, tasks, and hypotheses yet to be considered by CAMT.	Convene a series of working sessions to review and potentially refine the current SDSRC conceptual model; identify, screen and document published reports and empirical data, as linked to the conceptual model. Identify key information gaps. Identify key scientific agreements and disagreements. Review PWA questions and hypotheses in this context, and develop a collaboratively produced report.	- Status updates in April, June, and August of 2014 - Draft report September 2014 - Final report November 2014

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>High Priority: Expected for implementation in 2014</b>				
2. Briefing about SWFSC winter-run salmonid life cycle model LCM).	What is the general structure of the model and what are key assumptions, key uncertainties, and evaluation metrics used to assess biological responses to alternative export operations, changes in river flows, DCC gate operations, habitat capacity, and other actions on salmon survival and abundance? How will the model be validated? Will the model be available for independent peer review and simulations?	In order to ensure development of a widely accepted LCM, its development should be transparent and shared with interested parties.	A briefing needs to be held on the status of the SWFSC salmonid LCM and its specific components with interested and knowledgeable parties.	Briefing to CAMT and interested parties by April 2014
3. Data synthesis and meta-analysis	Can synthesis of data from previous Delta salmonid tagging studies be combined and analyzed to address key questions/ uncertainties about the direct and indirect ecological effects of exports on salmonid	There are numerous salmonid tagging studies conducted in the Delta over the past several decades that, when considered together, can potentially address key uncertainties about factors affecting migrational behavior and survival of juvenile	Pending review and agreement on a proposal: 1) establish a working group to plan and oversee the strategy for identification and meta-analysis of existing data; 2) identify initial questions to address and relevant	- SDSRC will revise and agree on a written proposal by April 2014; - Progress report March 2015; anticipated to continue in 2015; draft report by November 2015; manuscript for publication completed

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>High Priority: Expected for implementation in 2014</b>				
	survival?	salmonids	data sets; and 3) conduct preliminary analyses.	by June 2016
4. Pending results of the gap analysis and initial data synthesis efforts (Elements 1 and 3); investigate alternative metric(s) for management of south Delta water operations.	Are there alternative or additional metrics (e.g., OMR flows, export volumes, monthly export limits, etc.) that can be used to manage south Delta water operations, and improve survival of migrating salmonids in the south Delta?	SDSRC participants discussed metrics in addition to, or other than, inflow:export ratio that may be relevant to manage south Delta water operations to improve salmonid survival.	Convene a working group to synthesize and evaluate existing data to identify potential metrics and evaluate their benefits and limitations.	<ul style="list-style-type: none"> <li>- Status check in June 2014</li> <li>- Progress report November 2014</li> </ul>
5. Re-charter the SDSRC	Should the SDSRC be re-chartered to report to the CAMT?		Modify the charter to require the SDSRC to periodically report progress to the CAMT. SDSRC will continue to use existing facilitator.	

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priority: May be implemented in 2014, contingent on progress of high priority workplan elements</b>				
6. Pending outcomes of Elements 1, 3, and 4, investigate tools to evaluate the efficacy of export management actions.	To what extent and under what conditions do the export management actions reduce mortality of migrating salmonids?		Summarize tools available or in development that can be used to evaluate the efficacy of export management actions.	Pending outcomes of other workplan elements, status check in November 2014
7. After briefing on SWFSC LCM, assessment of other potential modeling needs. Pending outcomes of Elements 1-4 identify and evaluate indirect ecological effects of project operations that affect the survival of listed salmonids.	<p>Are there questions important to CAMT that cannot be answered using the SWFSC LCM?</p> <p>Are there elements of other salmon models that would be beneficial to incorporate or link to the winter-run model (e.g., IOS, DPM, OBAN, SALMOD, Bureau egg mortality model, CALSIM, DSM2, etc.)?</p> <p>Are there alternative management actions that can address water project effects on listed salmonids?</p>	<p>CAMT is continuing to discuss the scope of management actions that should be evaluated within the CAMT scope. Future discussions should include:</p> <p>What management actions have the greatest influence on survival of salmonids migrating in the south Delta?</p> <p>What water management actions might be taken to improve salmon survival?</p> <p>What is the relative effectiveness of current and potential alternative management actions in improving salmon survival?</p>	<p>Pending acquisition of new resources, convene a working group to evaluate the potential for existing models or new tools to inform the consultation on project operations including:</p> <p>1) Review available information (including literature, data, and models) to identify controllable factors, linked to project operations, with greatest influence on survival; 2) Identify actions which might be taken to improve survival; 3) Evaluate actions and report relative</p>	<p>Status Update in September 2014</p> <p>Pending outcomes of Elements 1-4, complete preliminary analysis and write-up by November 2014.</p>

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priority: May be implemented in 2014, contingent on progress of high priority workplan elements</b>				
			contribution to survival.	
8. Define an expanded scope for the SDSRC to include indirect ecological effects of south Delta water operations	What are the indirect ecological effects of water export; and are there management actions to minimize indirect project effects that influence salmonid survival?	The SDSRC worked within a narrow scope focusing on direct export effects on hydrodynamics and direct behavioral and survival effects of altered hydrodynamics. Broadening the scope to including indirect effects (e.g., predation effects) could potentially inform approaches to minimize south Delta project operation effects on salmonid survival.	Conduct a working session of the SDSRC to agree on a detailed description of an expanded scope; link to the current SDSRC conceptual model.	Revised scope by March 2014
9. Enhanced learning from 6-year steelhead study (OCAP BiOp RPA VI.2.2)	Are there experimental modifications of the 6-year steelhead study that will enhance the understanding of the effect of inflow/export conditions on south Delta survival of steelhead?	The 6-year steelhead study is intended to estimate steelhead survival over a range of ambient inflow:export conditions. Recent analysis of conditions tested during the first three years identified several conditions that have not been tested or are underrepresented among the conditions tested to date. A greater range of conditions will also enhance learning in	Identify opportunities and develop plans to enhance learning from the 6-year steelhead survival study (RPA IV.2.2) by testing untested or underrepresented I:Es, testing combinations of very high and very low San Joaquin inflows and very high and very low export levels; and testing similar I:Es at different discharge volumes (e.g.,	Given evolving drought, it may be challenging to manipulate operations in April and May of 2014. - Identify options, develop implementation plans, and prepare request for prescribed conditions no later than June 2014; implementation in 2015 or later depending on environmental

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Secondary Priority: May be implemented in 2014, contingent on progress of high priority workplan elements</b>				
		ongoing USFWS fall-run Chinook survival studies.	1:1 at 1,500cfs/1,500cfs; 6,000cfs/6,000cfs. Any new experimental components will include a clear statement of objective, approach, and statistical analysis plan.	conditions; study plan, including proposed operations, would be developed for review no later than March 15.

Work Element	Key Question(s)	Relevance/Rationale	Possible Investigative Approach	Schedule
<b>Third Priority: important to CAMT but not likely to be implemented in 2014 pending results of ongoing research and development of necessary technology</b>				
10. Salmonid near-field movement under selected export and tidal conditions.	Does tidal forcing in combination with export volumes affect migrational behavior and survival of migrating south Delta salmonids?	The 2012 IRP recommended investigating the combined influence of export and tidal forcing on salmonid migrational behavior and survival. Based on a concept proposal developed in the SDSRC in 2013, this study was identified for further development.	Convene a working group to develop a detailed proposal suitable for peer review; including objectives, experimental approach, and a detailed statistical analysis plan. Arrange for and submit to external peer review. Review results of Enhanced PTM tool in development by SWFSC. A prerequisite for this	<ul style="list-style-type: none"> <li>- Proposal and peer review by November 2014;</li> <li>- Review of Enhanced PTM tool when available;</li> <li>- Implementation of Near-Field Movement study dependent on availability of a predation-sensitive acoustic tag (probably 2015)</li> </ul>

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			element is completing the testing and validation of the technology to distinguish a free swimming tagged salmonid from one that has been preyed upon.	
11. Pending gap analysis, investigate hatchery- and natural-origin salmonid surrogacy.	Are results of tests using hatchery-reared salmonids representative of results of natural-origin salmonids? Are the results of tests using one run of Chinook salmon representative of results of other runs? Are the results of tests using Chinook salmon representative of steelhead? If not, in each case can a correction factor be developed to allow for application of such test results?	The question of whether results of tests conducted using hatchery-reared salmonids are representative of results relevant to natural-origin salmon is a key uncertainty routinely identified in most survival studies.	Convene a working group to review and synthesize existing information on hatchery- and natural-origin surrogacy; if warranted, develop a concept proposal to investigate surrogacy.	SWFSC study planned for spring 2014 may provide information relevant to wild vs. hatchery surrogacy.