

# **MEMORANDUM OF AGREEMENT**

for the

## **IMPLEMENTATION OF THE 2008 and 2009 BIOLOGICAL OPINIONS FOR THE COORDINATED LONG-TERM OPERATION OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT**

by and between

### **THE CALIFORNIA DEPARTMENT OF WATER RESOURCES OF THE STATE OF CALIFORNIA AND THE UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION**

This Memorandum of Agreement ("Agreement") is entered into this 12<sup>TH</sup> day of DECEMBER, 2018, pursuant to the provisions of the California Water Resources Development Bond Act and other applicable laws of the State of California, and the Reclamation Act of June 17, 1902 (32 Stat. 388), as amended and supplemented, including but not limited to the Act of August 26, 1937 (50 stat. g44), as amended and supplemented, between the Department of Water Resources of the State of California ("DWR") and the United States Department of the Interior Bureau of Reclamation ("Reclamation"). DWR and Reclamation are referred to individually as "Party" and collectively as "Parties" in this Agreement.

#### **1.0 RECITALS OF THE MEMORANDUM**

- 1.1 The United States, through Reclamation, has constructed and is operating the Central Valley Project, California ("CVP"), for diversion, storage, carriage, distribution and beneficial use, for flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries.
- 1.2 DWR is a State agency within the California Natural Resources Agency responsible for constructing, operating, and maintaining the State Water Project ("SWP") storage and conveyance facilities located throughout California, including pumping facilities located in the Delta. The SWP is composed of 21 reservoirs and lakes and 11 other storage facilities with a combined storage capacity of more than 4 million acre-feet; five hydroelectric power plants and four pumping-generated plants; and more than 700 miles of major canals and aqueducts.

- 1.3 Pursuant to Sections 7.(a)(1) and (a)(2) of the Endangered Species Act of 1973, as amended and supplemented ("ESA"), Reclamation is to utilize its authorities in furtherance of the purposes of the ESA, and insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species.
- 1.4 On December 15, 2008, the United States Fish and Wildlife Service ("USFWS") issued a Biological Opinion on the Coordinated Long-Term Operation of the CVP and SWP ("USFWS BiOp"). The USFWS BiOp includes, among other things, monitoring and reporting requirements, Reasonable and Prudent Alternative ("RPA") Actions and Components, Reasonable and Prudent Measures ("RPM"), Terms and Conditions, and Conservation Recommendations.
- 1.5 On June 4, 2009, the National Marine Fisheries Service ("NMFS") issued a Biological Opinion and Conference Opinion on the Coordinated Long-Term Operation of the CVP and SWP ("NMFS BiOp"). The NMFS BiOp includes, among other things, monitoring and reporting requirements, RPA Actions and Components, RPM, Terms and Conditions, and Conservation Recommendations.
- 1.6 On August 2, 2016, DWR and Reclamation jointly requested the Reinitiation of Consultation on the Coordinated Long-Term Operation of the CVP and SWP, and by Presidential Memorandum, dated October 19, 2018, Reclamation shall issue a biological assessment by January 31, 2019, and USFWS and NMFS shall ensure issuance of their final biological opinions within 135 days thereafter.
- 1.7 The purpose of this Agreement is to: specifically identify funding for the joint and individual requirements for DWR and Reclamation that are set forth by the USFWS BiOp and the NMFS BiOp, and the subsequent and/or superseding biological opinions issued as described in Paragraph 1.6 (collectively referred to as "BiOps"); establish procedures for cooperation and collaboration; establish procedures for tracking and reporting expenditures; establish procedures to prioritize activities to satisfy the requirements of the BiOps; and, establish procedures for funding to implement the BiOps and this Agreement.

## **2.0 TERMS AND CONDITIONS**

### **2.1 Effective Date**

This Agreement shall become effective upon the date first hereinabove written and shall remain in effect for the duration of the BiOps; or terminated by written mutual agreement of the Parties hereto; or, by any Party as provided in Paragraph 4.5 herein.

## **2.2 Designation of Responsibilities**

The Parties acknowledge and agree that the requirements in the BiOps are the joint responsibility of DWR and Reclamation. The costs of these joint responsibilities are to be shared equally (50-percent to each Party), except as provided in Exhibits B and C herein. DWR and Reclamation shall be jointly responsible for satisfying the requirements set forth in Exhibit A. DWR shall be individually responsible for satisfying the requirements set forth in Exhibit B. Reclamation shall be individually responsible for satisfying the requirements set forth in Exhibit C. Exhibits A, B, and C to this Agreement may be revised at any time upon mutual written agreement of the Parties and without amendment of this Agreement; *Provided*, That Exhibits A, B, and C shall be revised by the Parties, without amendment of this Agreement, within ninety calendar days, unless otherwise modified by mutual agreement of the Parties, of the acceptance by Reclamation of the final biological opinions described in Paragraph 1.6 herein.

Within one month of the date hereinabove written, the Parties, recognizing this joint and shared responsibility, shall assign costs to DWR and Reclamation for each of the requirements in Exhibit A. In determining this proportional assignment, the Parties shall consider the existing expertise and knowledge of each Party, availability of existing and future funding, property and facility availability and requirements, costs of staff directly working on these requirements, and shall not include any indirect or overhead costs of any State or Federal agency. Nothing in this Agreement shall prohibit a Party from providing resources to the other Party's individual requirements, and such contributions shall be considered, upon mutual agreement of the Parties, as a contribution towards that Parties' joint responsibilities identified in Exhibit A.

## **2.3 Priority Projects and Actions**

The Parties, acknowledge that each has limited resources to contribute to satisfy the joint and individual requirements identified in Exhibits A, B, and C hereto, and agree that the greatest benefit will result when the Parties cooperate and coordinate in the allocation of resources, including but not limited to financial resources, to mutually agreed upon "Priority Projects and Actions". Within one month of the date first hereinabove written, the Parties shall: (i) identify and prioritize all of the Priority Projects and Actions; (ii) identify the estimated resources need and assign costs to DWR and Reclamation for each of the Priority Projects and Actions; and, (iii) select one or more Priority Projects or Actions to which the Parties agree to first contribute staff time, expertise, knowledge, money or property. This listing of Priority Projects and Actions shall be incorporated as Exhibit D to this Agreement, and shall be updated annually with the Annual Financial Review, and more frequently if necessary, upon written mutual agreement of the Parties and without amendment to this Agreement. For each

Priority Projects and Action identified in Exhibit D, the Parties shall produce and adopt a work plan setting forth, at a minimum, the:

- (i) Leads and key staff; and
- (ii) Schedule and milestones; and
- (iii) Estimated budget and resource needs.

### **3.0 COOPERATION AND COORDINATION**

#### **3.1 Cooperation and Coordination**

In order to further their mutual goals and objectives, the Parties shall communicate, coordinate, and cooperate with each other in order to ensure the efficient and effective administration of this Agreement and satisfaction of the requirements identified in Exhibits A, B, C and D hereto. In general, the Parties agree to:

- (i) Contribute equitable staff time, expertise, knowledge, money, and/or property as described in Paragraph 2.2 herein.
- (ii) Demonstrate flexibility in expenditures on activities to maximize the accomplishment of requirements.
- (iii) Work together in good faith to maximize efficiency, share knowledge, and coordinate.
- (iv) Openly share their respective science and participate in a shared framework for biological and water supply benefits.
- (v) Meet as provided in this Agreement, and as otherwise necessary.

#### **3.2 Annual Financial Review Process and Meetings**

No later than December 31 of each year this Agreement is in effect, the Parties agree to provide the Directors of DWR and Reclamation a joint "Annual Financial Review", which will set forth, at a minimum:

- (i) A succinct narrative describing significant matters relating to compliance with the BiOps, including significant accomplishments of the prior calendar year.
- (ii) Each Party's contributions, for the prior calendar year, towards the satisfaction of the requirements listed on Exhibits A, B, C and D hereto.

- (iii) Forecasted costs for the next five years.

Within three months of the date first hereinabove written, DWR and Reclamation will adopt an agreed upon financial reporting plan further detailing the annual financial review and reporting process.

## **4.0 MISCELLANEOUS PROVISIONS**

### **4.1 Contacts**

Each Party will designate a point of contact and alternate who will be responsible for administration of this Agreement on behalf of each Party. The point of contacts will meet at least quarterly to discuss cost-sharing, project update, and other significant information. Within one week of the date hereinabove written, each Party shall provide in writing to the other party with its initial point of contact and alternate, and each Party may change its point of contact and/or alternate by written notice to the other Party.

### **4.2 No Delegation of Authority**

Nothing in this Agreement shall cause, or shall be deemed to cause, any delegation of authority from any Party in this Agreement to any other Party.

### **4.3 Severability**

In the event one or more provisions contained in this Agreement is rendered illegal or impossible, or implementation is otherwise barred in any way by, executive or legislative brand action, or by policy decisions therein, the Parties will meet and confer to determine whether such portion will be deemed severed from this Agreement and the remaining parts of the Agreement will remain in full force and effect as though such illegal, impossible, or barred portion had never been part of this Agreement.

### **4.4 Preservation of Rights and Authorities**

All provisions of this Agreement are intended and will be interpreted to be consistent with all applicable provisions of State and Federal law. The Parties recognize that each party to this Agreement has specific statutory and regulatory authority and responsibilities, and that actions of these public agencies must be consistent with applicable procedural and substantive requirements. Nothing in this Agreement is intended to, nor will have the effect of, constraining or limiting any public entity in carrying out its statutory responsibilities. Nothing in this Agreement constitutes an admission by any party as to the proper interpretation of any provision of law, nor is anything in this Agreement is intended to, nor will it have the effect of, waiving or limiting any public entity's rights and remedies under any applicable law. The purpose of this Agreement is to determine the allocation of costs to satisfy the requirements of the BiOps as identified in Exhibits A, B, and C hereto.

#### **4.5 Dispute Resolution**

In the event of a dispute regarding interpretation or implementation of this Agreement, a party shall provide written notice of the dispute to the other Party. The Parties shall endeavor to resolve the dispute by meeting within 30 days of the written notice, or at a later date by mutual written agreement by the Parties. The representative for each party to this meeting shall be an individual authorized by that party to resolve interpretation of this Agreement or implementation issues. If the dispute is unresolved following the meeting, the Director of DWR and the Regional Director of Reclamation or their designees shall meet within 30 days (Directors' meeting), or at a later date by mutual written agreement of the Parties, after the initial meeting to resolve the dispute. If the dispute still remains unresolved, the Parties may elect to terminate this Agreement. Except as specifically provided, nothing herein is intended to waive or abridge any right or remedy that any party may have.

#### **4.6 Federal - Availability of Appropriations**

The expenditure or advance of any money or the performance of any obligation of Reclamation under this Agreement shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds to the United States shall not relieve DWR from any obligations under this Agreement. No liability shall accrue to the United States in case funds are not appropriated or allotted.

#### **4.7 State – Availability of Funds**

The commitments and obligations under this Agreement of the State, by and through DWR, are subject to the availability of funds. Absence of funds to the State shall not relieve Reclamation from any obligations under this Agreement. No liability shall accrue to the State for failure to perform any obligation under this Agreement in the event that funds are not available.

#### **4.8 Drafting Considerations**

This Agreement has been negotiated and reviewed by the Parties, each of whom is sophisticated in the matters to which this Agreement pertains and no one party shall be considered to have drafted any articles in this Agreement.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the day and year first written above.

**CALIFORNIA DEPARTMENT OF  
WATER RESOURCES:**



Karla Nemeth, Director

12-12-18

**BUREAU OF RECLAMATION:**



Michael Ryan, Regional Director

**DWR and Reclamation have agreed to revise and update Exhibit A  
within 30 days of execution of the Cost Share Agreement**



## **Exhibit A**

Line Item	Requirements Information					DWR Projects & Operational Tasks & Activities	USBR Projects & Operational Tasks & Activities
	Agency	Action Title (BiOp-ITP Requiremen	Action Status	Action Description	Parent Action	DWR Projects & Operational Tasks & Activities	USBR Projects & Operational Tasks & Activities
1.0	NMFS	11.2.1.3 (1)	Active	1) <b>Reclamation and DWR</b> shall participate in the design, implementation, and funding of the comprehensive CV steelhead monitoring program, under development through ERP, that includes adult and juvenile direct counts, redd surveys, and escapement estimates on CVP- and SWP-controlled streams. This program is necessary to develop better juvenile production estimates that form the basis of incidental take limits and will also provide necessary information to calculate triggers for operational actions.	11.2.1	RC: Sac River Basin Steelhead Monitoring Study Initiation(Charter In-progress)	<b>Red Bluff Diversion Dam Rotary Trap Juvenile Monitoring Project:</b> Quantification of passage and production of juvenile salmonids produced in the upper Sacramento River, CA. <b>Sacramento River Basin Salmonid Monitoring:</b> Conduct annual Chinook salmon spawning escapement surveys in the Sacramento River Basin (mainstem, Deer Creek, Antelope Creek, Mill Creek, Clear Creek, Battle Creek, Cottonwood Creek, Cow Creek, Bear Creek, and American River) to estimate the abundance and distribution of Chinook salmon spawners.
2.0	NMFS	11.2.1.3 (2)	Active	2) <b>Reclamation and DWR</b> shall ensure that all monitoring programs regarding the effects of CVP and SWP operations and which result in the direct take of winter-run, spring-run, CV steelhead, or Southern DPS of green sturgeon, are conducted by a person or entity that has been authorized by NMFS. <b>Reclamation and DWR</b> shall establish a contact person to coordinate these activities with NMFS.	11.2.1	NOTE: Coordination is ongoing; monitoring programs being developed and funded through both agencies for listed species.	
3.0	NMFS	11.2.1.3 (3, 4, 6)	Active	3) <b>Reclamation and DWR</b> shall submit weekly reports to the interagency Data Assessment Team (DAT) regarding the results of monitoring and incidental take of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon associated with operations of project facilities.  4) <b>Reclamation and DWR</b> shall provide an annual written report to NMFS no later than October 1, following the salvage season of approximately October to May. This report shall provide the data gathered and summarize the results of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon monitoring and incidental take associated with the operation of the Delta pumping plants (including the Rock Slough Pumping Plant). All juvenile mortality must be minimized and reported, including those from special studies conducted during salvage operations. This report should be sent to NMFS (Southwest Region, Protected Resources Division, Sacramento Area Office, 650 Capitol Mall, Suite 8-300, Sacramento, California 95814-4706).  6) <b>Reclamation and DWR</b> shall submit weekly DAT reports and an annual written report to NMFS describing the results of real-time monitoring of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon associated with operations of the DCC and CVP and SWP Delta pumping facilities, and other Division level operations authorized through this RPA.	11.2.1	RC: DAT SWC Reporting RC: Weekly and Annually DAT Meetings and Reports	
4.0	NMFS	11.2.1.3 (5)	Active	5) <b>Reclamation and DWR</b> shall continue the real-time monitoring of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon in the lower Sacramento River, the lower San Joaquin River, and the Delta to establish presence and timing to serve as a basis for the management of DCC gate operations and CVP and SWP Delta pumping operations consistent with actions in this RPA. Reclamation and DWR shall conduct continuous real-time monitoring between October 1 and June 30 of each year, commencing in 2009.	11.2.1	RC: Real-time Monitoring	
5.0	NMFS	11.2.1.3 (8)	Active	<b>Reclamation and DWR</b> shall jointly fund these monitoring locations p 585 (8) Monitoring Requirements: The following (A-E) are necessary to adaptively manage project operations and are either directly related to management of releases (e.g., temperature and flow), or are a necessary component the Salmon Decision Process used to manage Delta operations (e.g., DCC gates and export pumping). Reclamation and DWR shall jointly fund these monitoring locations for the duration of the Opinion (through 2030) to ensure compliance with the RPA and assess the performance of the RPA actions. Most of these monitoring stations already exist and are currently being funded through a variety of sources (i.e., CDFG, USFWS, Reclamation, DWR, CALFED, and Interagency Ecological Program), however, CALFED funding for monitoring ends in 2009 and CDFG funding has been reduced due to budget cuts. a) Upstream: Adult escapement and juvenile monitoring for spring-run, winter-run, and steelhead on the Sacramento River, American River, Feather River, Clear Creek, Mill Creek, Deer Creek and Battle Creek. These may be performed through carcass surveys, redd surveys, weir counts, and rotary screw trapping. b) RBDD: Adult counts using the three current fish ladders until the new pumping plant is operational. Rotary screw trapping to determine juvenile Chinook salmon passage or abundance year-round before and after pumping plant is operational. Green sturgeon monitoring, to include adult and juvenile estimates of passage, relative abundance, and run timing, in order to determine habitat use and population size with respect to management of Shasta Reservoir resources. c) Sacramento River new juvenile monitoring station: The exact location to be determined, between RBDD and Knights Landing, in order to give early warning of fish movement and determine survival of listed fish species leaving spawning habitat in the upper Sacramento River. d) Delta: Continuation of the following monitoring stations that are part of the IEP: Chipps Island Trawl, Sacramento Trawl, Knights Landings RST, and beach seining program. Additionally, assist in funding new studies to determine green sturgeon relative abundance and habitat use in the Delta. e) San Joaquin River monitoring shall include: Adult escapement and juvenile monitoring for steelhead on the Stanislaus River; Mossdale Kodiak Trawling to determine steelhead smolt passage; steelhead survival studies associated with VAMP; monitoring at HORB to determine steelhead movement in and around the barrier; predation studies in front of HORB and at the three agricultural barriers in the South Delta; and new studies to include the use of non-lethal fish guidance devices (e.g., sound, light, or air bubbles) instead of rock barriers to keep juveniles out of the area influenced by export pumping.	11.2.1	OPCM: OCO Steelhead Monitoring Program OPCM: Rotary Screw Trap Monitoring - Sacramento River OPCM: Salmonid Monitoring	<b>Juvenile Salmon Monitoring:</b> Year round beach seining throughout the San Francisco Estuary and surface trawling at Chipps Island, Sacramento, and Mossdale to monitor the relative abundance and distribution (spatial and temporal) of juvenile Chinook Salmon and other native species in the Central Valley of California.

6.0	NMFS	11.2.2: Action 1.2.6	Active*	<p><b>Reclamation</b> shall direct discretionary funds to implement the Battle Creek Salmon and Steelhead Restoration Project. Phase 1A funding is currently allocated through various partners and scheduled to commence in Summer 2009 (Reclamation 2008c). <b>DWR</b> shall direct discretionary funds for Phase 1B and Phase 2, consistent with the proposed amended Delta Fish Agreement by December 31 of each year. <b>Reclamation and DWR</b> will submit a written report to NMFS on the status of the project, including phases completed, funds expended, effectiveness of project actions, additional actions planned (including a schedule for further actions), and additional funds needed. The Battle Creek Salmon and Steelhead Restoration Project shall be completed no later than 2019.</p> <p><b>Objective:</b> To partially compensate for unavoidable adverse effects of project operations by restoring winter-run and spring-run to the Battle Creek watershed. A second population of winter-run would reduce the risk of extinction of the species from lost resiliency and increased vulnerability to catastrophic events.</p>		<p>FRPA: <b>Battle Creek Salmon and Steelhead Restoration Project</b></p> <p><b>*Action Completed</b> - DWR believes that it has fully met its compliance obligation for this Action 1.2.6 (see history below) and expects to receive written acknowledgement from NMFS.</p> <p>1/18/2013: DWR sent letter to NMFS regarding DWR's transfer of \$12 million to CDFW (formerly DFG) and USBR for the Battle Creek Salmon and Steelhead Restoration Project as set forth under this RPA. DWR requested that "...NMFS confirms in writing that the transfer of the \$12 million to DFG and reclamation has fully satisfied all its obligations under Action 1.2.6 of the BiOp."</p> <p>5/6/2013: NMFS sends response letter to DWR acknowledging the \$12 million transfer, but does not confirm that the transferred amount fully satisfies all of DWR's obligations under the RPA.</p>	Additional monitoring will be conducted to ensure performance objectives are achieved. Annual progress report to NMFS to be completed by USBR.
7.0	NMFS	11.2.2: Action 1.6 (Suite)	Active	<p><b>Sacramento River Basin Salmonid Rearing Habitat Improvements</b></p> <p><b>Objective:</b> To restore floodplain rearing habitat for juvenile winter-run, spring-run, and CV steelhead in the lower Sacramento River basin, to compensate for unavoidable adverse effects of project operations. This objective may be achieved at the Yolo Bypass, and/or through actions in other suitable areas of the lower Sacramento River.</p> <p><i>The suite of actions includes near term and long-term actions. The near-term action (Action 1.6.2) is ready to be implemented and can provide rearing benefits within two years of issuing this Opinion. The long-term actions (Actions 1.6.1, 1.6.3, and 1.6.4) require additional planning and coordination over a five- to ten-year time frame.</i></p> <p>These actions are consistent with Reclamation's broad authorities in CVPIA to develop and implement these types of restoration projects. When necessary to achieve the overall objectives of this action, <b>Reclamation and DWR</b>, in cooperation with other agencies and funding sources, including the Delta Fish Agreement and any amendments, shall: (1) apply for necessary permits; (2) seek to purchase land, easements, and/or water rights from willing sellers; (3) seek additional authority and/or funding from Congress or the California State Legislature, respectively; and (4) pursue a Memorandum of Agreement with the Corps.</p> <p><i>Similar actions addressing rearing and fish passage are under consideration in the BDCP development process and may ultimately satisfy the requirements in Actions 1.6 and 1.7. BDCP is scheduled to be completed by December 31, 2010.</i></p> <p><i>See subsection for language p 608-610</i></p>	11.2.2: Action I	See subsections below.	Reclamation believes that their role for this Suite of actions was to prioritize the fish passage program. Reclamation should be partnering with the USACE for the actions under 1.6 given the facilities such as modification of Fremont Weir, and should be coordinating with the CVFMB. The actions under 1.6.1-1.6.4 were originally to be addressed as part of the 4 Pumps Agreement and are actions to be taken by DWR in coordination with CDFWS, sports and recreation fishing agencies and environmental agencies. Reclamation continues to seek authority and appropriations for these activities. Negotiations regarding cost sharing should recognize historic funding agreement requirement of the agencies and appropriate cost sharing balancing.
8.0	NMFS	11.2.2: Action 1.6.1	Active	<p><b>Restoration of Floodplain Rearing Habitat</b></p> <p>"In cooperation with CDFG, USFWS, NMFS, and the Corps, <b>Reclamation and DWR</b> shall...", to the maximum extent of their authorities (excluding condemnation authority), provide significantly increased acreage of seasonal floodplain rearing habitat, with biologically appropriate durations and magnitudes, from December through April, in the lower Sacramento River basin, on a return rate of approximately one to three years, depending on water year type. In the event that this action conflicts with Shasta Operations Actions 1.2.1 to 1.2.3, the Shasta Operations Actions shall prevail. (p 608)</p> <p><b>Objective:</b> To restore floodplain rearing habitat for juvenile winter-run, spring-run, and CV steelhead in the lower Sacramento River basin. This objective may be achieved at the Yolo Bypass, and/or through actions in other suitable areas of the lower Sacramento River.</p>	11.2.2: Action I	<p>YBR: 2016 Yolo Bypass Salmon Study (YBSS)</p> <p>FRPA: Decker Island (SE) Acquisition and Habitat Restoration</p> <p>FRPA: Prospect Island Tidal Habitat Restoration</p> <p>FRPA: Tule Red Restoration Project</p> <p>YBR: Yolo Bypass Salmonid Habitat Restoration and Fish Passage</p> <p>EIS-R</p>	
9.0	NMFS	11.2.2: Action 1.6.2	Active	<p><b>Near-Term Actions at Liberty Island/Lower Cache Slough and Lower Yolo Bypass</b></p> <p>By September 30, 2010, <b>Reclamation and/or DWR</b> shall take all necessary steps to ensure that an enhancement plan is completed and implemented for Liberty Island/Lower Cache Slough, as described in Appendix 2-C. This action shall be monitored for the subsequent five years, at a minimum, to evaluate the use of the area by juvenile salmonids and to measure changes in growth rates. Interim monitoring reports shall be submitted to NMFS annually, by September 30 each year, and a <b>final monitoring report shall be submitted on September 30, 2015, or in the fifth year following implementation of enhancement actions</b>. NMFS will determine at that time whether modification of the action or additional monitoring is necessary to achieve or confirm the desired results. This action shall be designed to avoid stranding or migration barriers for juvenile salmon.</p> <p><b>Objective:</b> This action shall be designed to avoid stranding or migration barriers for juvenile salmon.</p>	11.2.2: Action I	FRPA: <b>Liberty Island/Lower Cache Slough</b> <p>DWR submitted an official letter to NMFS in February 2012 and submitted the FRP Implementation Strategy (Plan) to meet the "Liberty Island/Lower Cache Slough enhancement plan" that is required by RPA 1.6.2. NMFS acknowledged the receipt of these documents.</p>	
10.0	NMFS	11.2.2: Action 1.6.3	Active	<p><b>Lower Putah Creek Enhancements</b></p> <p>By December 31, 2015, <b>Reclamation and/or DWR</b> shall develop and implement Lower Putah Creek enhancements as described in Appendix 2-C, including stream realignment and floodplain restoration for fish passage improvement and multi-species habitat development on existing public lands. By September 1 of each year, <b>Reclamation and/or DWR</b> shall submit to NMFS a progress report towards the successful implementation of this action. This action shall not result in stranding or migration barriers for juvenile salmon.</p> <p><b>Objective:</b> This action shall not result in stranding or migration barriers for juvenile salmon.</p>	11.2.2: Action I	YBR: <b>Lower Putah Creek Restoration Project</b> <p>The project is being developed under a CDFW grant by the Yolo Basin Foundation. The grant expires March, 2016.</p> <p>A progress report was sent to NMFS in September 2015.</p> <p>This RPA Action has been identified as an Early Implementation Project under the State's CA EcoRestore Initiative.</p>	

11.0	NMFS	11.2.2: Action I.6.4	Active	<p><b>Improvements to Lisbon Weir</b></p> <p>By December 31, 2015, <b>Reclamation and/or DWR</b> shall, to the maximum extent of their authorities, assure that improvements to the Lisbon Weir are made that are likely to achieve the fish and wildlife benefits described in Appendix 2-C. Improvements will include modification or replacement of Lisbon Weir, if necessary to achieve the desired benefits for fish. If neither Reclamation nor DWR has authority to make structural or operational modifications to the weir, they shall work with the owners and operators of the weir to make the desired improvements, including providing funding and technical assistance. By September 1 of each year, <b>Reclamation and/or DWR</b> shall submit to NMFS a report on progress toward the successful implementation of this action. Reclamation and DWR must assure that this action does not result in migration barriers or stranding of juvenile salmon.</p> <p><b>Objective:</b> To restore floodplain rearing habitat for juvenile winter-run, spring-run, and CV steelhead in the lower Sacramento River basin, to compensate for unavoidable adverse effects of project operations. This objective may be achieved at the Yolo Bypass, and/or through actions in other suitable areas of the lower Sacramento River.</p>	11.2.2: Action I	<p>YBR: <b>Lisbon Weir Fish Passage Project</b></p> <p>A progress report was sent to NMFS in September 2015. Project Charter process initiated in 2017.</p> <p>This RPA Action has been identified as an Early Implementation Project under the State's CA EcoRestore Initiative.</p>	
12.0	NMFS	11.2.2: Action I.7	Active	<p><b>Reduce Migratory Delays and Loss of Salmon, Steelhead, and Sturgeon at Fremont Weir and Other Structures in the Yolo Bypass</b></p> <p><b>Objective:</b> Reduce migratory delays and loss of adult and juvenile winter-run, spring-run, CV steelhead and Southern DPS of green sturgeon at Fremont Weir and other structures in the Yolo Bypass.</p> <p><b>Action:</b> By December 31, 2011, as part of the plan described in Action I.6.1, <b>Reclamation and/or DWR</b> shall submit a plan to NMFS to provide for high quality, reliable migratory passage for Sacramento Basin adult and juvenile anadromous fishes through the Yolo Bypass. By June 30, 2012, <b>Reclamation and/or DWR</b> shall obtain NMFS concurrence and, to the maximum extent of their authorities, and in cooperation with other agencies and funding sources, begin implementation of the plan, including any physical modifications. By September 30, 2009, <b>Reclamation</b> shall request in writing that the Corps take necessary steps to alter Fremont Weir and/or any other facilities or operations requirements of the Sacramento River Flood Control Project or Yolo Bypass facility in order to provide fish passage and shall offer to enter into a Memorandum of Understanding, interagency agreement, or other similar mechanism, to provide technical assistance and funding for the necessary work. By June 30, 2010, <b>Reclamation</b> shall provide a written report to NMFS on the status of its efforts to complete this action, in cooperation with the Corps, including milestones and timelines to complete passage improvements. <b>Reclamation and/or DWR</b> shall assess the performance of improved passage and flows through the bypass, to include an adult component for salmonids and sturgeon (i.e., at a minimum, acoustic receivers placed at the head and tail of the bypass to detect use by adults).</p>	11.2.2: Action I	<p>YBR: <b>2016 Yolo Bypass Salmon Study (YBSS)</b></p> <p>YBR: <b>Fremont Weir Adult Fish Passage Modification Project</b></p> <p>YBR: <b>Wallace Weir Fish Rescue Facility Project</b></p> <p>YBR: <b>Yolo Bypass Salmonid Habitat Restoration and Fish Passage EIS-R</b></p> <p>See Action I.6.1. Components of this RPA Action have also been identified as Early Implementation Projects under the State's CA EcoRestore Initiative. Wallace Weir Improvements are the highest priority (Implementation scheduled for 2016), followed by Tule Canal Agricultural Crossing Improvements paired with Fremont Weir Fish Passage Improvements (Implementation scheduled for 2017) and Lisbon Weir fish passage improvements (Implementation schedule TBD).</p>	<p><b>3D Flow Modeling of Selected Sections on the Sacramento River for Fish Bypass Projects:</b> This work will include tasks to process bathymetry, facility, and terrain data; generate 2D and 3D CFD mesh; simulate hydraulics under selected flow conditions; and complete reporting. This work will take place at Georgiana Slough and Fremont Weir sections of the Sacramento River to support RPA science needs. Also applies to <b>NMFS IV.2.2</b></p>
13.0	NMFS	11.2.2: Action IV.1.1	Active	<p><b>Monitoring and Alerts to Trigger Changes in DCC Operations</b></p> <p>Monitoring of Chinook salmon migration in the Sacramento River Basin and the Delta currently occurs at the RBDD, in spring-run tributaries to the Sacramento River, on the Sacramento River at Knights Landing and Sacramento, and sites within the Delta. <b>Reclamation and DWR</b> shall continue to fund these ongoing monitoring programs, as well as the monitoring of salvage and loss of Chinook salmon juveniles at the Delta fish collection facilities operated by the CVP and SWP. Funding shall continue for the duration of the proposed action (2030). <b>Reclamation and DWR</b> may use their own fishery biologists to conduct these monitoring programs, or they may provide funds to other agencies to do the required monitoring. Monitoring protocols shall follow established procedures utilized by the USFWS, CDFG, <b>Reclamation, and DWR</b>. Information collected from the monitoring programs will be used to make real-time decisions regarding DCC gate operation and export pumping. The DOSS group (Action IV.5) and WOMT will use information from monitoring to make decisions regarding DCC closures consistent with procedures below. The DCC gate operations in the fall are initiated through a series of alerts. These alerts are signals that gate operations may need to be altered in the near future to avoid diversion of juvenile Chinook salmon migrating down the Sacramento River. (p. 633)</p> <p><b>Objective:</b> To provide timely information for DCC gate operation that will reduce loss of emigrating winter-run, spring-run, CV steelhead, and green sturgeon.</p>	11.2.2: Action IV	<p>NOTE: Letter from Reclamation and DWR submitted to NMFS in October requesting approval of including flow criteria as a first alert in October and November 2014 or increases in flow of more than 50%. Pending response from NMFS to DWR and Reclamation accepting the Mill &amp; Deer Creeks flow criterion for monitoring.</p>	<p><i>It needs to be determined what DWR and Reclamation are spending on this effort. Reclamation does (or provides funds) for monitoring at the <b>Red Bluff Diversion Dam</b> (RBDD). These figures should be considered as each agencies 'cost-share'.</i></p>
14.0	NMFS	11.2.2: Action IV.1.2	Active	<p><b>DCC Gate Operation</b></p> <p><b>Objective:</b> Modify DCC gate operation to reduce direct and indirect mortality of emigrating juvenile salmonids and green sturgeon in November, December, and January.</p> <p><b>Action:</b> During the period between November 1 and June 15, DCC gate operations will be modified from the proposed action to reduce loss of emigrating salmonids and green sturgeon. The operating criteria provide for longer periods of gate closures during the emigration season to reduce direct and indirect mortality of yearling spring-run, winter-run, and CV steelhead. From December 1 to January 31, the gates will remain closed, except as operations are allowed using the implementation procedures/modified Salmon Decision Tree (below).</p> <p><b>Implementation procedures:</b> Monitoring data related to triggers in the decision tree will be reported on DAT calls and evaluated by DOSS (for formation of DOSS – see <b>Action IV.5</b> ). <b>Reclamation/DWR</b> shall take actions within 24 hours of a triggered condition occurring. If the decision tree requires an evaluation of data or provides options, then DOSS shall convene within one day of the trigger being met. DOSS shall provide advice to NMFS, and the action shall be vetted through WOMT standard operating procedures.</p>	11.2.2: Action IV	<p>NOTE: DCC Gates operations had been modified according to the <b>2016 Drought Contingency Plan For Water Project Operations February - November 2016</b>, p 25 - see below:</p> <p>iii. <b>Delta Cross Channel Gates</b></p> <p>Based on current and projected water quality in the Delta, and at least 3 weeks prior to any need to open the DCC gates, <b>Reclamation and DWR</b> will determine whether adjustments in the timing of the opening of the DCC gates should occur in order to address the prospects of elevated salinities in the Delta (Action IV.1.2). If flexibility in DCC gate operations is warranted, the DCC gate triggers matrix will be likely be proposed to determine risk to species and DCC gate operation in the event the DCC gates are opened to address water quality or supply concerns. The triggers outlined in this matrix provide direction for when the gates may remain open and a method that balances water supply and fishery objectives in the Delta.</p>	

15.0	NMFS	11.2.2: Action IV.1.3	Active	<p><b>Consider Engineering Solutions to Further Reduce Diversion of Emigrating Juvenile Salmonids to the Interior and Southern Delta, and Reduce Exposure to CVP and SWP Export Facilities</b></p> <p><b>Objectives:</b> Prevent emigrating salmonids from entering the Georgiana Slough channel from the Sacramento River during their downstream migration through the Delta. Prevent emigrating salmonids from entering channels in the south Delta (e.g., Old River, Turner Cut) that increase entrainment risk to CV steelhead migrating from the San Joaquin River through the Delta.</p> <p><b>Action:</b> <b>Reclamation and/or DWR</b> shall convene a working group to consider engineering solutions to further reduce diversion of emigrating juvenile salmonids to the interior Delta and consequent exposure to CVP and SWP export facilities. The working group, comprised of representatives from Reclamation, DWR, NMFS, USFWS, and CDFG, shall develop and evaluate proposed designs for their effectiveness. in reducing adverse impacts on listed fish and their critical habitat.</p> <p><b>Reclamation or DWR</b> shall subject any proposed engineering solutions to external independent peer review and report the initial findings to NMFS by <i>March 30, 2012</i> . <b>Reclamation or DWR</b> shall provide a final report on recommended approaches by <i>March 30, 2015</i> . If NMFS approves an approach in the report, <b>Reclamation or DWR</b> shall implement it. To avoid duplication of efforts or conflicting solutions, this action should be coordinated with USFWS’ Delta smelt biological opinion and BDCP’s consideration of conveyance alternatives.(p 640)</p>	11.2.2: Action IV	<p>ES: 2014 Georgiana Slough Barrier (GSB) Study</p> <p>ES: Engineering Solutions Study</p> <p>ES: <b>Georgiana Slough Non-Physical Barrier (2011 and 2012)</b></p> <p>NOTE: Delta Science Program Review 4/2012; Final Report from DWR to NMFS 6/30/12. The Phase I (Initial Findings) report was completed December 2013. The Phase II report was submitted to NMFS on March 30, 2015.</p> <p>ES: Salmon Protection Technology Study (SPTS)-Initiating  Charter In-Progress</p>	
16.0	NMFS	11.2.2: Action IV.2.1	Active	<p><b>San Joaquin River Inflow to Export Ratio</b></p> <p>Phase I: Interim Operations in 2010-2011. From April 1 through May 31: 1. Flows at Vernalis (7-day running average shall not be less than 7 percent of the target requirement) shall be based on the New Melones Index<sup>32</sup>. In addition to the Goodwin flow schedule for the Stanislaus River prescribed in Action III.1.3 and Appendix 2-E, Reclamation shall increase its releases at Goodwin Reservoir, if necessary, in order to meet the flows required at Vernalis, as provided in the following table. NMFS expects that tributary contributions of water from the Tuolumne and Merced rivers, through the SJRA, will continue through 2011 and that the installation of a fish barrier at the Head of Old River will continue to occur during this period as permitted.</p> <p>2. Combined CVP and SWP exports shall be restricted through the following. In addition: 1) Reclamation/DWR shall seek supplemental agreement with the SJRGA as soon as possible to achieve minimum long term flows at Vernalis (see following table) through all existing authorities. Phase II: Beginning in 2012: From April 1 through May 31: 1. <b>Reclamation</b> shall continue to implement the Goodwin flow schedule for the Stanislaus River prescribed in Action III.1.3 and Appendix 2-E. 2. <b>Reclamation and DWR</b> shall implement the Vernalis flow-to-combined export ratios in the following table, based on a 14-day running average exception procedure for multiple dry years: If the previous 2 years plus current year of San Joaquin Valley “60-20-20” Water Year Hydrologic Classification and Indicator as defined in D-1641 and provided in following table, is 6 or less, AND the New Melones Index is less than 1 MAF, exports shall be limited to a 1:1 ratio with San Joaquin River inflow, as measured at Vernalis.</p> <p><b>Objective:</b> To reduce the vulnerability of emigrating CV steelhead within the lower San Joaquin River to entrainment into the channels of the South Delta and at the pumps due to the diversion of water by the export facilities in the South Delta, by increasing the inflow to export ratio. To enhance the likelihood of salmonids successfully exiting the Delta at Chipps Island by creating more suitable hydraulic conditions in the main stem of the San Joaquin River for emigrating fish, including greater net downstream flows.</p>		<p>NOTE: The year type for the San Joaquin Basin during implementation of the I:E ratio in April and May 2015 was designated as “Critical”, which required implementation of a 1:1 ratio of Vernalis inflow to combined CVP/SWP exports (I:E ratio), though implementation of this RPA action was modified under the Drought Operations Plan. While the Drought Operations Plan allowed for modification of I:E implementation during the first half of April and the second half of May, because of other conditions, the I:E implementation was modified only during the first half of April in that the I:E ratio of 1:1 did not limit exports during that early April period.</p> <p>NOTE: USBR and DWR use separate efforts to perform their Water Supply Impact Accounting and Export Mgmt Compliance Reports.</p>	Reclamation believes that this action ties into the CVP-SWP <b>Coordinated Operations Agreement (COA)</b> . As such, the COA could be used as a basis for how we are sharing costs related to implementing this action.
17.0	NMFS	11.2.2: Action IV.2.2	Active	<p><b>Six-Year Acoustic Tag Experiment</b></p> <p><b>Action:</b> <b>Reclamation and DWR</b> shall fund a 6-year research-oriented action concurrent with Action IV.2.1. The research shall be composed of studies utilizing acoustically-tagged salmonids, and will be implemented to assess the behavior and movement of the outmigrating fish in the lower San Joaquin River. The studies will include three releases of acoustic tagged fish, timed to coincide with different periods and operations: March 1 through March 31, April 1 through May 31, and June 1 through June 15. NMFS anticipates that studies will utilize clipped hatchery steelhead and hatchery fall-run as test fish. During the period from March 1 through March 30, the exports will be operated in accordance with the requirements dictated by action IV.2.3. During the 60-day period between April 1 and May 30, exports will be dictated by the requirements of action IV.2.1. Reclamation shall operate to a minimum 1:1 inflow to export ratio during the period between June 1 and June 15, allowing exports to vary in relation to inflows from the San Joaquin to test varying flow to export ratios during this period. If daily water temperatures at Mossdale exceed 72°F for seven consecutive days during the period between June 1 and June 15, then the inflow to export ratio may be relaxed. NMFS anticipates that warm water conditions in the lower San Joaquin River will not be suitable for steelhead under these conditions. (p 645)</p> <p><b>Objective:</b> To confirm proportional causes of mortality due to flows, exports and other project and non-project adverse effects on steelhead smolts out-migrating from the San Joaquin basin and through the southern Delta.</p>	11.2.2: Action IV	<p>ES: <b>Six-Year Steelhead Study</b></p>	<b>6-Year Steelhead Telemetry Study Analysis and Reporting:</b> Study was designed to use results from the Six-year steelhead telemetry study during 2011-2016 to evaluate juvenile steelhead route selection at channel divergences in south Delta and along mainstem San Joaquin River, and how these behaviors influence survival in specific reaches and through the Delta to Chipps Island. This is the first in a three-year agreement to achieve full examination of 2011-2016 results by the end of FY19. <b>3D Flow Modeling of Selected Sections on the Sacramento River for Fish Bypass Projects:</b> This work will include tasks to process bathymetry, facility, and terrain data; generate 2D and 3D CFD mesh; simulate hydraulics under selected flow conditions; and complete reporting. This work will take place at Georgiana Slough and Fremont Weir sections of the Sacramento River to support RPA science needs. Also applies to <b>NMFS I.7.1</b>
18.0	NMFS	11.2.2: Action IV.2.3	Active	<p><b>Old and Middle River Flow Management</b></p> <p><b>Action:</b> From January 1 through June 15, reduce exports, as necessary, to limit negative flows to -2,500 to -5,000 cfs in Old and Middle Rivers, depending on the presence of salmonids. The reverse flow will be managed within this range to reduce flows toward the pumps during periods of increased salmonid presence.</p> <p><b>Objective:</b> Reduce the vulnerability of emigrating juvenile winter-run, yearling spring-run, and CV steelhead within the lower Sacramento and San Joaquin rivers to entrainment into the channels of the South Delta and at the pumps due to the diversion of water by the export facilities in the South Delta. Enhance the likelihood of salmonids successfully exiting the Delta at Chipps Island by creating more suitable hydraulic conditions in the mainstem of the San Joaquin River for emigrating fish, including greater net downstream flows.</p>	11.2.2: Action IV	<p>NOTE: USBR and DWR use separate efforts to perform their own Water Supply Impact Accounting and Export Mgmt Compliance Reports.</p>	in WY 2015, from January 1 through June 9 (the action ended before mid-June because conditions for the temperature off-ramp were met), none of the loss density triggers were exceeded. Therefore, with the exception of modifications allowed during March 2014, Action IV.2.3 limited the flows in Old River and Middle River (OMR flows) to be no more negative than -5,000 cfs on a 14-day average. In WY 2014, Reclamation proposed and NMFS approved, with some conditions, a trial implementation of the “OMR Index Demonstration Project”, during which OMR compliance would be measured using the OMR Index (an estimate of OMR flow based on an equation that includes Vernalis flow and exports) rather than the tidally-averaged daily OMR based on USGS gauge data. However, OMR was controlling for approximately 28 days during the following timeframes: 2/11/14-2/17/14, 3/6/14-3/16/14, 3/27/14-4/7/14, 4/10/14-4/12/14.

19.0	NMFS	11.2.2: Action IV.3	Active	<p><b>Reduce Likelihood of Entrainment or Salvage at the Export Facilities</b></p> <p><b>Action:</b> From November 1 through April 30, operations of the <i>Tracy and Skinner Fish Collection Facilities</i> shall be modified according to monitoring data from upstream of the Delta. In conjunction with the two alerts for closure of the DCC (Action IV.1.1), the Third Alert shall be used to signal that export operations may need to be altered in the near future due to large numbers of juvenile Chinook salmon migrating into the upper Delta region, increasing their risk of entrainment into the central and south Delta and then to the export pumps. Third Alert: The catch index is greater than 10 fish captured per day from November 1 to February 28, or greater than 15 fish captured per day from March 1 to April 30, from either the Knights Landing catch index or the Sacramento catch index.</p> <p><b>Objective:</b> Reduce losses of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon by reducing exports when large numbers of juvenile Chinook salmon are migrating into the upper Delta region, at risk of entrainment into the central and south Delta and then to the export pumps in the following weeks.</p>	11.2.2: Action IV	<p>RC: <b>Coded Wire Tagging (CWT)</b></p> <p>OPWM: <b>OCO Biological Opinions SWP Only</b></p> <p>OPCM: <b>OCO Delta Modeling</b></p> <p>OPWM: <b>OCO Export Mgmt Compliance Report SWP Only</b></p> <p>OPWM: <b>OCO Export Mgmt Impact Actig SWP Only</b></p> <p>OPWM: <b>OCO Export Mgmt Short-Term Planning SWP Only</b></p> <p>OPWM: <b>OCO Water Mgmt Long-Term Analysis SWP</b></p> <p>NOTE: During WY 2015, no triggers were tripped that required action under RPA IV.3.</p>	<p><b>Coleman Hatchery Late Fall Chinook Tagging:</b> Hatchery produced late fall-run Chinook Salmon and naturally produced endangered winter-run Chinook salmon overlap in size significantly. To prevent taking winter-run, monitoring programs and Federal and State pumping facilities must be able to differentiate between the two races. Approximately 1,100,000 late fall-run Chinook Salmon are marked and tagged each year. The coded wire tags are purchased by the USBR and tagging and marking operations are conducted at the Coleman National Fish Hatchery by USFWS personnel or by sub-contractors. Contract costs are for the actual tagging of the fish. Operations costs include operational oversight and recovery of tags from adults at the hatchery.</p>
20.0	NMFS	11.2.2: Action IV.4 (Suite)	Active	<p><b>Modifications of the Operations and Infrastructure of the CVP and SWP Fish Collection Facilities</b></p> <p><b>Action: Reclamation and DWR</b> shall each achieve a whole facility salvage efficiency of 75 percent at their respective fish collection facilities. <b>Reclamation and DWR</b> shall implement the following actions to reduce losses associated with the salvage process, including: (1) conduct studies to evaluate current operations and salvage criteria to reduce take associated with salvage, (2) develop new procedures and modifications to improve the current operations, and (3) implement changes to the physical infrastructure of the facilities where information indicates such changes need to be made. Reclamation shall continue to fund and implement the CVPIA Tracy Fish Facility Program. In addition, <b>Reclamation and DWR</b> shall fund quality control and quality assurance programs, genetic analysis, louver cleaning loss studies, release site studies and predation studies. Funding shall also include new studies to estimate green sturgeon screening efficiency at both facilities and survival through the trucking and handling process.</p> <p><b>Objective:</b> Achieve 75 percent performance goal for whole facility salvage at both state and Federal facilities. Increase the efficiency of the Tracy and Skinner Fish Collection Facilities to improve the overall salvage survival of winter-run, spring-run, CV steelhead, and green sturgeon.</p>	11.2.2: Action IV	<p>PREP: <b>Skinner Evaluations and Improvements</b></p> <p>NOTE: Construction of the new Fish Science Building at the Skinner Fish Facility has been completed by DWR and is fully operational. This new facility has been critical in continuing DWR's studies on predation in the Forebay, Skinner efficiency studies, and release site studies. However, the drought and low flow conditions in the Forebay have impacted some of these studies.</p> <p>DWR-Only: <b>IV.4.2 (1)(2a)(2b)(3)</b> Skinner Fish Collection Facility Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency.</p> <p><b>Objective:</b> Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.</p>	<p>USBR-Only: <b>IV.4.1</b> Tracy Fish Collection Facility (TFCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency.</p> <p><b>Objective:</b> Implement specific measures to reduce pre-screen loss and improve screening efficiency at Federal facilities.</p>
21.0	NMFS	11.2.2: Action IV.4.3 (1-8)	Active	<p><b>Tracy Fish Collection Facility and the Skinner Fish Collection Facility Actions to Improve Salvage Monitoring, Reporting and Release Survival Rates</b></p> <p><b>Action: Reclamation and DWR</b> shall undertake the following actions at the TFCF and the Skinner Fish Collection Facility, respectively. Actions shall commence by October 1, 2009, unless stated otherwise.</p> <p><b>Objective:</b> To improve overall survival of listed species at facilities through accurate, rapid salvage reporting and state-of-the-art salvage release procedures. This reporting is also necessary to provide information needed to trigger OMR actions.</p> <p>(1) Sampling rates at the facilities for fish salvage counts shall be no less than 30 minutes every 2 hours (25 percent of operational time) year round to increase the accuracy of salvage estimates used in the determination of trigger levels. Exceptions to the 30-minute count may occur with NMFS' concurrence under unusual situations, such as high fish densities or excessive debris loading.</p> <p>(2) By October 1, 2010, websites shall be created or improved to make salvage count data publicly available within 2 days of observations of the counts. Information available on the website shall include at a minimum:</p> <p>a) duration of count in minutes; b) species of fish salvaged; c) number of fish salvaged including raw counts and expanded counts; d) volume of water in acre-feet, and average daily flow in cfs; e) daily average channel velocity and bypass ratio in each channel, primary and secondary; f) average daily water temperature and electrical conductivity data for each facility; and g) periods of non-operation due to cleaning, power outages, or repairs.</p> <p>(3) Release Site Studies shall be conducted to develop methods to reduce predation at the "end of the pipe" following release of salvaged fish. Studies shall examine but are not limited to: a) potential use of barges to release the fish in different locations within the western Delta with slow dispersion of fish from barge holding tanks to Delta waters; b) multiple release points (up to six) in western Delta with randomized release schedule; and c) conducting a benefit to cost analysis to maximize this ratio while reducing predation at release site to 50% of the current rate.</p> <p>(4) By June 15, 2011, predation reduction methods shall be implemented according to analysis in 3. By June 15, 2014, achieve a predation rate that has been reduced 50 percent from current rate.</p> <p>(5) Add salt to water within the tanker trucks hauling fish to reduce stress of transport.</p> <p>Assess use of other means to reduce stress, protect mucous slime coat on fish, and prevent infections from abrasions (i.e., commercially available products for this purpose).</p> <p>(6) All personnel conducting fish counts must be trained in juvenile fish identification and have working knowledge of fish physiology and biology.</p> <p>(7) Tanker truck runs to release salmonids should be scheduled at least every 12 hours, or more frequently if required by the "Bates Table" calculations (made at each count and recorded on the monthly report).</p> <p>(8) <b>Reclamation and DWR</b> shall use the Bates Table to maintain suitable environmental conditions for fish in hauling trucks. Trucks should never be overcrowded so that the carrying capacity of the tanker truck is exceeded.</p>	11.2.2: Action IV	<p>PREP: <b>Skinner Evaluations and Improvements</b></p> <p><b>11.2.2: Action IV.4.3 (1)(3)(4)(5)(6)(7)(8)</b></p> <p>(3) NOTE: Final Release Site Predation Study Report released by DWR May 2010 and Evaluation of Mortality and Injury in a Fish Release Pipe released by DWR August 2010.</p> <p>• <b>Curtis Landing*:</b> A complete refurbishment of this site was completed in 2014 and the site became operational in early 2015.</p> <p>• <b>Little Baja*/Manzo Ranch*:</b> Two new fish release sites on Sherman Island are currently under construction and scheduled for completion in 2017. Significant levee rehabilitation, widening, and raising is necessary at these sites and began in late 2015.</p> <p>• Predation monitoring utilizing DIDSON technology has been ongoing at the Curtis Landing and Horseshoe Bend sites since the Curtis Landing site returned to operation. A comprehensive monitoring plan to monitor predation at the new and existing sites is currently under development.</p> <p>• Debris removal at Horseshoe Bend and Curtis Landing sites conducted bi-annually on an as needed basis. No debris removal was required in WY 2014.</p> <p>• Reclamation has taken the lead on analyzing opportunities for transporting and releasing fish by barge.</p> <p><b>NOTE: DWR has three * facilities for which they are fully responsible and USBR has three facilities for which they are fully responsible. Between both DWR and USBR we are jointly responsible for "up to six" release sites.</b></p>	<p>11.2.2: Action IV.4.3 (2)</p> <p><b>NOTE:</b> Reclamation's Central Valley Operations Office is the lead on this action. Fish salvage data presently available through CVO and DFW websites: <a href="http://www.usbr.gov/mp/cvo/fishrpt.html">www.usbr.gov/mp/cvo/fishrpt.html</a> and <a href="http://www.dfg.ca.gov/delta/data/salvage">www.dfg.ca.gov/delta/data/salvage</a>. DFW improved the salvage website in 2010.</p>
22.0	NMFS	11.2.2: Action IV.5	Complete	<p><b>Objective:</b> Create a technical advisory team .that will provide recommendations to WOMT and NMFS on measures to reduce adverse effects of Delta operations of the CVP and SWP to salmonids and green sturgeon and will coordinate the work of the other technical teams.</p>	11.2.2: Action IV	RC: Project Work Team DOSS	
23.0	NMFS	13.3 (1) Reasonable & Prudent Measures (RPM) 1.	Active	<p><b>1. Reclamation and DWR</b> shall monitor the extent of incidental take of winter-run, spring-run, green sturgeon, and CV steelhead, associated with the operation of the CVP's Jones and SWP's Harvey Banks pumping facilities. (p 781)</p> <p><b>Objective:</b> NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of winter-run, spring-run, CV steelhead, and the Southern DPS of green sturgeon.</p>	13.3	___Monitoring Coordination is ongoing between both agencies.	
24.0	NMFS	13.3 (4) Reasonable & Prudent Measures (RPM) 4.	Active	<p><b>4. Reclamation and DWR</b> shall monitoring all incidental take associated with CVP and SWP operations. (p 782)</p>	13.3	___Monitoring Coordination is ongoing between both agencies.	
25.0	NMFS	13.3 (5) Reasonable & Prudent Measures (RPM) 5.	Active	<p><b>5. Reclamation and DWR</b> shall annually report to NMFS the incidental take resulting from the implementation of the Proposed Action. (p 782)</p>	13.3	___Reporting Coordination is ongoing between both agencies.	

26.0	NMFS	13.4 (1 a) Terms & Conditions (T&C)	Active	<p><b>Reclamation and DWR</b> must comply or ensure compliance by their contractor(s) with the following <i>terms and conditions</i>, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.</p> <p>1. <b>Reclamation and DWR</b> shall monitor the extent of incidental take of winter-run, spring-run, green sturgeon, and CV steelhead, associated with the operation of the CVP's Jones and SWP's Harvey Banks pumping facilities.</p> <p>a. <b>Reclamation and DWR</b> shall calculate winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon loss at the Jones and Banks pumping plants on a real-time basis from October 1 through June 30 each year. Loss and salvage shall be computed using formulas developed in consultation with CDFG and USFWS and approved by NMFS. (p782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
27.0	NMFS	13.4 (1 b)	Active	<p>b. <b>Reclamation and DWR</b> shall monitor the loss of juvenile winter-run at the CVP and SWP Delta pumping facilities and will use that information to determine whether the anticipated level of loss is likely to exceed the authorized level of 2 percent, cumulatively, of the estimated number of juvenile winter-run entering the Delta annually. (p 782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
28.0	NMFS	13.4 (1 c)	Active	<p>c. <b>Reclamation and DWR</b> shall monitor the loss of identified spring-run surrogate release groups at the CVP and SWP Delta pumping facilities and use that information to determine whether the cumulative estimated level of loss is expected to exceed 1%. (p 782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
29.0	NMFS	13.4 (1 d)	Active	<p>d. <b>Reclamation and DWR</b> shall monitor the salvage of CV steelhead at the CVP and SWP Delta pumping facilities and use that information to determine whether the cumulative estimated level of salvage is expected to exceed 3,000 unclipped steelhead (juveniles and adults combined) at the CVP and SWP Delta pumping facilities. Incidental take of CV steelhead shall be reported as salvage and calculated loss. (p 782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
30.0	NMFS	13.4 (1 e)	Active	<p>e. <b>Reclamation and DWR</b> shall monitor the loss of juvenile green sturgeon at the CVP and SWP Delta pumping facilities and use that information to determine whether the cumulative estimated level of loss is expected to exceed 110 juveniles annually (previous 10-year average). (p 782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
31.0	NMFS	13.4 (1 f)	Active	<p>f. If the estimated rate of loss approaches the incidental take level anticipated for any of the anadromous fish species at the SWP Harvey Banks pumping facility combined with the estimated take at the CVP Jones pumping facility is exceeded, <b>Reclamation and DWR</b> shall immediately convene the WOMET to explore additional measures which can be (missing text in document). (p 782)</p>	13.4	___Activities ongoing and being completed by both agencies.	
32.0	NMFS	13.4 (1 i)	Active	<p>i. <b>Reclamation and DWR</b> shall submit weekly reports to the interagency DAT and an annual written report to NMFS describing, as a minimum, the estimated salvage and loss of winter-run, spring-run, steelhead, and green sturgeon associated with operations of the Jones and Harvey Banks pumping facilities, respectively. (p 783)</p>	13.4	___Activities ongoing and being completed by both agencies.	
33.0	NMFS	13.4 (4 a) Terms & Conditions (T&C)	Active	<p>4. <b>Reclamation and DWR</b> shall monitor all incidental take associated with CVP and SWP operations. (p 785)</p> <p>a. Reclamation shall implement all aspects of RPA section 11.2.1.3</p>	13.4	___Activities ongoing and being completed by both agencies.	
34.0	NMFS	13.4 (5 a - c) Terms & Conditions (T&C)	Active	<p>5. <b>Reclamation and DWR</b> shall annually report to NMFS the incidental take resulting from the implementation of the Proposed Action.</p> <p>a. <b>Reclamation and DWR</b> shall provide an annual written report to NMFS no later than October 1 of each year. This report shall provide the data gathered and summarize the results of winter-run, spring-run, CV steelhead, and green sturgeon monitoring and incidental take associated with the CVP and SWP operations. All mortalities must be minimized and reported, including those from special studies conducted during salvage operations.</p> <p>b. <b>Reclamation and DWR</b> shall provide reports and updates to NMFS by the specified dates, as provided in various RPA actions (e.g., section 11.2.1.3 #3, Action I.1.3, Action Suite I.2).</p> <p>c. Unless otherwise specified during the implementation of these terms and conditions, all reports and updates shall be sent to: Supervisor, Sacramento Area Office, NMFS, 650 Capitol Mall, 8-300, Sacramento, CA 95814.</p>	13.4	___Activities ongoing and being completed by both agencies.	
35.0	NMFS	14.0 (2) Conservation Recommendations	Active	<p>Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS thinks the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation:</p> <p>2. <b>Reclamation and DWR</b> should continue to work with the BDCP process to develop a scientifically-based, alternative conveyance program for the Delta that conserves all ESA-listed anadromous fish species in the Central Valley. This effort should evaluate a new point of diversion in the Sacramento River without adding new stressors to listed fish and their critical habitats. If NMFS determines that locations and operations are available which minimize adverse effects to all listed species and designated critical habitats, then Reclamation and DWR should pursue alternative locations and operations for Delta diversions. (p 786)</p>	14.0	___Activities ongoing and being completed by both agencies.	



36.0	USFWS	RPA Component 3: Action 4	Active	<p><b>Improve Habitat for Delta Smelt Growth and Rearing: ESTUARINE HABITAT DURING FALL</b></p> <p><b>Objective:</b> To improve fall habitat for delta smelt through increasing Delta outflow during fall. Increase in fall habitat quality and quantity will both benefit delta smelt.</p> <p>Subject to adaptive management as described below and in Action 4 in Attachment B, during September and October in years when the preceeding precipitation and runoff period was wet or above normal as defined by the Sacramento Basin 40-30-30 index, Reclamation and DWR shall provide sufficient Delta outflow to maintain monthly average X2 no greater (more eastward) than 74 km (from the Golden Gate) in Wet WYs and 81 km in Above Normal WYs. The monthly X2 target will be separately achieved for the months of September and October. During any November when the preceeding all inflow into CVP/SWP reservoirs in the Sacramento Basin shall be added to reservoir releases in November to provide an additional increment of outflow from the Delta to augment Delta outflow up to the fall X2 of 74 km for Wet WYs or 81 km for Above Normal WYs, respectively. In the event there is an increase in storage during any November this action applies, the increase in reservoir storage shall be released in December to augment the December outflow requirements in SWRCB D-1641. Given the nature of this Action and to align its management more closely with the general plan described by the independent review team and developed by Walters (1997), the Service shall oversee and direct the implementation of a formal adaptive management process. The adaptive management process shall include the elements as described in Attachment B. This adaptive management program shall be reviewed and approved by the Service in addition to other studies that are required for delta smelt. In accordance with the adaptive management plan, the Service will review new scientific information when provided and may make changes to the action when the best available scientific information warrants. For example, there may be other ways to achieve the biological goals of this action, such as a Delta outflow target, that will be evaluated as part of the study. This action may be modified by the Service consistent with the intention of this action based on information provided by the adaptive management program in consideration of the needs of other listed species. Other CVP/SWP obligations may also be considered. The adaptive management program shall have specific implementation deadlines. The creation of the delta smelt habitat study group, initial habitat conceptual model review, formulation of performance measures, implementation of performance evaluation, and peer review of the performance measures and evaluation that are described in steps (1) through (3) of Attachment B shall be completed before September 2009. Additional studies addressing elements of the habitat conceptual model shall be formulated as soon as possible, promptly implemented, and reported as soon as complete. The Service shall conduct a comprehensive review of the outcomes of the Action and the effectiveness of the adaptive management program ten years from the signing of the biological opinion, or sooner if circumstances warrant. This review shall entail an independent peer review of the Action. The purposes of the review shall be to evaluate the overall benefits of the Action and to evaluate the effectiveness of the adaptive management program. At the end of 10 years or sooner, this action, based on the peer review and Service determination as to its efficacy shall either be continued, modified or terminated.</p>	USFWS	<p>OPCM: BIOP Water Supply Impact Accounting</p> <p>OPCM: OCO Delta Modeling</p> <p>OPWM OCO Export Mgmt Compliance Report SWP Only</p> <p>OPWM OCO Export Mgmt Impact Actig SWP Only</p> <p>OPWM OCO Export Mgmt Short-Term Planning SWP Only</p> <p>OPWM OCO OCO Water Mgmt Long-Term Analysis SWP</p>
37.0	USFWS	RPA Component 5	Active	<p><b>Monitoring and Reporting</b></p> <p><b>Reclamation and DWR</b> shall ensure that information is gathered and reported to ensure:</p> <ol style="list-style-type: none"> <li>1) proper implementation of these actions,</li> <li>2) that the physical results of these actions are achieved, and</li> <li>3) that information is gathered to evaluate the effectiveness of these actions on the targeted life stages of delta smelt so that the actions can be refined, if needed. (p 284)</li> </ol>	USFWS	
38.0	USFWS	RPM 1: T&C 1 Reasonable & Prudent Measures (RPM) Terms & Conditions (T&C)	Active	<p><i>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</i></p> <p><b>RPM 1.</b> Minimize adverse effects of the operations of the <b>Permanent Operable Gates</b> **.</p> <p>In order to be exempt from the prohibitions of section 9 of the Act, <b>Reclamation</b> shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary. (p 294)</p> <p><b>T&amp;C 1:</b> The following Term and Condition implements Reasonable and Prudent Measures one (1)</p> <ol style="list-style-type: none"> <li>1. The Service shall have the final decision on the operations of the Permanent Gates. The members of the GORT can provide suggestions to operate the gates, but the ultimate decision on how to operate the gates to protect delta smelt will be made by the Service.</li> </ol> <p><b>** NOTE:</b> The referenced <b>Permanent Operable Gates</b> were never constructed, thereby this requirement currently does not apply to either USBR or DWR. Per meeting with DWR and USBR on 11/4/2016, this requirement is shared USBR/DWR due to several factors and longstanding conditions</p>	USFWS	
39.0	USFWS	RPM 3: T&C 3 (1)	Active	<p><i>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</i></p> <p><b>RPM 3:</b> Obtain real time data on the abundance and distribution of delta smelt in the Bay-Delta. (p 294)</p> <p><b>T&amp;C 3 (1):</b> The following Terms and Conditions implement Reasonable and Prudent Measures three (3):</p> <ol style="list-style-type: none"> <li>1. During the months of December through July, when water is being diverted, <b>Reclamation and DWR</b> shall ensure that the frequency of sampling for delta smelt at Banks and Jones will be at least 25 percent of the time.</li> </ol>	USFWS	
40.0	USFWS	RPM 3: T&C 3 (2)	Active	<p><i>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</i></p> <p><b>RPM 3:</b> Obtain real time data on the abundance and distribution of delta smelt in the Bay-Delta.</p> <p><b>T&amp;C 3 (2): Reclamation and DWR</b> shall develop a methodology for quantitative larval monitoring at Banks and Jones to help refine the triggers for the Actions in the RPA. An interim plan shall be submitted to the Service for approval within 30 days of the issuance of this biological opinion so the monitoring can be implemented this year. A more detailed plan shall be developed and approved by the Service within one year. (p 295)</p>	USFWS	



41.0	USFWS	RPM 4: T&C 4	Active	<p><i>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</i></p> <p><b>RPM 4:</b> Minimize adverse effects of Banks and Jones on delta smelt.</p> <p><b>T&amp;C 3 (2):</b> The following Term and Condition implements Reasonable and Prudent Measures four (4):</p> <p>1. <b>Reclamation</b> will develop within 30 days a methodology for dealing with transitions in operations after changes in OMR flow requirements.</p> <p>Note: Banks is a DWR operated facility</p>	USFWS		
42.0	USFWS	Monitoring Requirements	Active	Monitoring requirements in accordance with section 402.14(i)(3) of the implementing regulations for section 7 of the Act have been included as part of the RPA and must be implemented by <b>Reclamation and DWR</b> . (p 295)	USFWS		
43.0	USFWS	Reporting Requirements	Active	<p><b>Reclamation or DWR</b> shall immediately report to the Service any information about take or suspected take of federally-listed species not authorized in this biological opinion. Reclamation or DWR must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident or of the finding of a dead or injured delta smelt. Any killed delta smelt that have been taken should be properly preserved in accordance with Natural History Museum of Los Angeles County policy of accessioning (10 percent formalin in quart jar or freezing). Information concerning how the fish was taken, length of the interval between death and preservation, the water temperature and outflow/tide conditions, and any other relevant information should be written on 100 percent rag content paper with permanent ink and included in the container with the specimen...(p 295)</p>	USFWS		

## **Exhibit B**

Summary of DWR Only BiOPS

Split	DWR Only
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NMFS					
11.2.2: Action IV.4.2 (1)	Tracy Fish Collection Facility (TFCCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.  Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility:  1) By December 31, 2012, operate the whole Skinner Fish Protection Facility to achieve a minimum 75 percent salvage efficiency for CV salmon, steelhead, and Southern DPS of green sturgeon after fish enter the primary channels in front of the louvers.  656	DWR shall undertake p 655	One Time	12/31/2012
					Immediately
11.2.2: Action IV.4.2 (2a)	Tracy Fish Collection Facility (TFCCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.  Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility:  2) Immediately commence studies to develop predator control methods for Clifton Court Forebay that will reduce salmon and steelhead pre-screen loss in Clifton Court Forebay to no more than 40 percent.  a) On or before March 31, 2011, improved predator control methods. Full compliance shall be achieved by March 31, 2014. Failure to meet this timeline shall result in the cessation of incidental take exemption at SMP facilities unless NMFS agrees to an extended timeline.	Based on Location this is a DWR BIOP	One Time	3/31/2014
				On-Going	3/31/2011
11.2.2: Action IV.4.2 (2b)	Tracy Fish Collection Facility (TFCCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.  Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility:  2) Immediately commence studies to develop predator control methods for Clifton Court Forebay that will reduce salmon and steelhead pre-screen loss in Clifton Court Forebay to no more than 40 percent.  b) DWR may petition the Fish and Game Commission to increase bag limits on striped bass caught in Clifton Court Forebay.	DWR may petition p 656	On-Going	Weekly Additional Bag Limits for striped bass needed
11.2.2: Action IV.4.2 (3)	Tracy Fish Collection Facility (TFCCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.  Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility:  3) Remove predators in the secondary channel at least once per week	Based on Location this is a DWR BIOP	On-Going	Weekly
11.2.2: Action IV.6	South Delta Improvement Program—Phase I (Permanent Operable Gates)	Replace temporary barriers with permanent operable gates in the South Delta	DWR shall not implement p 659	One Time	when the analyses of the operations of the temporary barriers is completed
13.4 (1 g)	Terms and Conditions	Reclamation and DWR must comply or ensure compliance by their contractor(s) with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary. 1. Reclamation and DWR shall monitor the extent of incidental take of winter-run, spring-run, green sturgeon, and CV steelhead, associated with the operation of the CVP's Jones and SWP's Harvey Banks pumping facilities.  g. DWR shall collect additional data at the Clifton Court Forebay, the John Skinner Fish Collection Facility, and the Harvey Banks pumping plant to monitor the incidental take of winter-run, spring-run, steelhead, and green sturgeon and to develop and implement improvements to pumping facility operations to further reduce or minimize losses of listed salmonids.	DWR shall collect additional data p 782	On-Going	TBD (Clifton Court Forebay)  TBD (Harvey Banks pumping plant)
					TBD (John Skinner Fish Collection Facility)
13.4 (1 h)	Terms and Conditions	Reclamation and DWR must comply or ensure compliance by their contractor(s) with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary. 1. Reclamation and DWR shall monitor the extent of incidental take of winter-run, spring-run, green sturgeon, and CV steelhead, associated with the operation of the CVP's Jones and SWP's Harvey Banks pumping facilities.  h. DNA tissue samples and CWT samples from juvenile winter-run, spring-run, and steelhead at the Tracy and Skinner fish collection facilities shall be collected by DWR or CDFG for genetic analysis or tag removal/reading pursuant to the sampling protocols established by the IEP Salmon Genetics Project Work Team. Tissues shall be stored at the CDFG tissue bank at Rancho Cordova for subsequent analysis by Oregon State University or similar lab approved by NMFS. Whole fish or heads for CWT processing and identification shall be stored at the USFWS Bay/Delta Office in Stockton. All samples shall be clearly marked according to office protocol and a log maintained at each storage facility.	shall be collected by DWR or CDFG p 783	On-Going	TBD (Skinner fish collection facilities)
					TBD (Tracy)
14.0 (5)	Conservation Recommendations	Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS thinks the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation:  5. DWR should continue to fund the Amended Delta Fish Agreement (Amendment) to mitigate, compensate for, and enhance habitat for anadromous salmonids in the Central Valley. Past actions under this agreement have improved upstream habitats and conditions for spring-run, fall-run, and steelhead and have contributed to the current status of the species. Ongoing actions identified in the Amendment should be continued, if the benefits of past actions are to be maintained. NMFS expects that this Amendment will also support implementation of actions specified in this RPA, such as re-introduction of winter-run to Battle Creek and habitat improvements at the Yolo Bypass, Liberty Island and other areas.	DWR should continue to fund p 786	On-Going	Acceptance of the BIOP

Litigation					
BIOP Remand Litigation	Remand Litigation for USFWS and NMFS BIOPs	<p>The Bureau of Reclamation began formal consultation in 2008 with the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) on the coordinated, longterm operation of the Central Valley Project (CVP) and the State Water Project (SWP) pursuant to Section 7 of the Endangered Species Act (ESA). The biological opinions (BOs) issued by the Service and NMFS (collectively, the Services) were remanded by the U.S. District Court for the Eastern District of California and both agencies were ordered to issue new BOs. In addition, Reclamation was ordered by the court to comply with the National Environmental Policy Act (NEPA) prior to accepting and implementing the action described in the new BOs to be issued by the Services. Because the BOs will address the operation of the SWP, it is expected that the remand process will support development of a Consistency Determination under the California ESA for the operation of the SWP in coordination with the CVP.</p> <p>Reclamation has determined that the California Department of Water Resources (DWR) qualifies as an "applicant" within the meaning of Section 7 of the ESA. Accordingly, Reclamation will work in partnership with DWR to successfully complete the remand process. DWR will also be a cooperating agency in the NEPA process. In addition to working closely with and seeking information from DWR throughout the remand and NEPA processes, Reclamation will also undertake the Remand Stakeholder Engagement (RSE) process described in this paper. DWR, as the applicant, will participate in the RSE process.</p> <p>The impetus for the RSE process was the discussions held in the fall of 2011 between certain parties in the Consolidated Salmonid Cases and Consolidated Delta Smelt Cases. These discussions attempted to reach a stipulated agreement regarding a schedule and process for the participation of non-Federal parties in the remand and NEPA processes. While an agreement was not reached, the commitments made by eclamation during those discussions, which are within its purview, will be voluntarily effected through the RSE process.</p> <p>Reclamation, Service, and NMFS must meet the deadlines ordered by the court. Accordingly, there will be limits on the time available for the RSE process. Furthermore, final decisions regarding the environmental impact statement (EIS), the content of information to be submitted by Reclamation to supplement its 2008 biological assessment and the additional information which it provided to the Service in 2011 (collectively, the 2008 supplemented BA), the action to be consulted upon, and the acceptance of reasonable and prudent alternatives (RPAs), if any, proposed by the Services in their new BOs are legally omitted to</p>		One Time	(TBD) Completion of Consult
CAMT 0.1	Program Management	<p>The CSAMP relies on a combination of agency staff and contractor support to conduct its work, including program planning and science investigations. It is estimated that CSAMP participants contributed approximately 4.5 full-time equivalents (FTEs) in the form of in-kind staff commitments to the Program in 2015. In addition to existing staff resources, approximately \$1.3 million was expended in 2015 for contracted support, including funds for technical studies. Program activities are generally classified according to the following:</p> <p>1. Management and Facilitation: Includes: (a) management and facilitation of Policy Group meetings, CAMT meetings, and Scoping Team meetings; (b) management of contracts for CAMT support and technical investigations; and (c) planning and coordination, including development of annual work plans and budgets.</p> <p>2. Sponsored Participants: Provides funding for contractors representing NGOs and PWAs on CAMT and scoping teams, including the Salmon Scoping Team cochairs.</p> <p>3. Technical Studies: Represents investigations developed based on extensive dialogue within the CAMT Delta Smelt Scoping Team (DSST) and Salmon Scoping Team (SST).</p> <p>4. Peer Review: Includes coordinating with and funding independent peer reviews through the Delta Science Program (DSP).</p> <p>Table 2 provides a breakdown of 2015 capital expenditures according to the categories listed above. Table 3 provides a summary of capital expenditures by participating entity, not including in-kind staff contributions. Significant effort was expended in 2015 to secure the funding and staff commitments necessary to complete the work that was initiated in 2014. Beyond funding to operate the program in 2015, CAMT secured funding and staff commitments to continue the CSAMP through 2016, including \$2.5 million to complete all the high priority work plan elements identified in 2014. Details regarding the CSAMP budget for 2016 are provided in Section 3.</p> <p>In addition to securing funding and staff commitments, CAMT expended significant time and resources in 2015 to negotiate and execute contracts necessary to implement technical studies. Contracts for three of the four technical studies were executed in 2015. Contract negotiations for the fourth study - Fall Outflow Management for Delta Smelt are underway and are expected to be completed in the first quarter of 2016. CAMT also spent time in 2015 working with the Policy Group to establish a more refined project workflow process that better defines roles and responsibilities and key decision points in terms of identifying study needs, securing funding, and managing projects. Figure 1 provides a graphical depiction of a generalized workflow process for new studies. The process is specifically intended to allow for parallel activities designed to shorten the amount of time required to develop study proposals, secure funding and execute contracts.</p>		On-Going	Annually
CAMT 2.1 - 2.5	Fall Outflow Management for Delta Smelt	<p>Another high-priority 2014 Workplan element for Delta Smelt involved looking at the importance of fall outflow. The DSST prepared a scope of work in the summer of 2014 and engaged an independent team of technical experts to prepare a detailed proposal. In 2015, the Fall outflow investigative team delivered a detailed proposal which was subsequently subjected to an independent peer review coordinated by the DSP. Based on results of the review, the team met with the DSST to discuss potential revisions to the proposal and prepared a detailed response to comments. The Department of Water Resources and the Delta Science Program have committed funding to implement the study and are currently contracting for the work which will begin in 2016. A summary of the study is provided in Attachment B.</p>		One Time	TBD (End Date)
ITP Settlement Agreement	Settlement Agreement for ITPs	<p>2. Longfin Science Program.</p> <p>a. The Parties have collaboratively developed and agree to implement in good faith the multi-year longfin science program more particularly described in Exhibit "I" attached hereto and incorporated herein by this reference ("Longfin Science Program").</p> <p>b. The Longfin Science Program encompasses a series of studies to be undertaken over the course of several years by DFW, DWR, the Contractors and their consultants. A technical team comprised of one designated representative with decision-making authority from each of the Parties ("Technical Team") will monitor the implementation, progress and outcomes of these studies. The members of the Technical Team may invite support staff or technical experts (e.g., Dr. James Hobbs, University of California, Davis) to assist with the implementation of the Longfin Science Program as needed. The Technical Team will be in charge of the scope, budget, level of effort and other day-to-day management of the Longfin Science Program. The Technical Team will work with other technical experts and groups, including but not limited to the Interagency Ecological Program ("IBP") Management Team and IBP work groups, as agreed to by the Technical Team, in developing and implementing the Longfin Science Program. The Technical Team will meet at least twice annually and may meet more often, if necessary, to adequately assess and ensure implementation of each of the components of the Longfin Science Program. Any one designated member of the Technical Team may call for a meeting at any time, with such meeting to be held within two weeks of being called, if feasible, but in all cases within four weeks, unless all members agree to a longer time. The Technical Team shall seek to operate by consensus. If the Technical Team does not unanimously agree on how to implement the Longfin Science Program, the Directors of DWR and DFW and the Contractors' General Manager or their designees shall meet and confer to reach resolution. The Parties anticipate that within approximately five years of the Effective Date the studies will have been implemented and evaluated and meetings of the Technical Team will no longer be necessary.</p> <p>c. If any of the studies within the Longfin Science Program cannot be implemented in whole or in part, or if the schedule for conducting any study is changed by one year or more from the generalized schedule described in Exhibit 1, the Technical Team shall meet in good faith to modify the Longfin Science Program as appropriate and adjust the implementation schedule as necessary to develop alternative studies or schedules designed to achieve the program objectives.</p> <p>d. DFW has reviewed the requirements of Permit Condition 8.4 and has determined that the effectiveness and performance monitoring program for the Roaring River Diversion Structure (RRDS) and the Sherman Island Diversion Structures (SIDS) does not require the inclusion of impingement or entrainment studies. The U.S. Fish and Wildlife Service 2008 Biological Opinion for Delta Smelt (Service File No. 81420-2008-F-1481-5) already requires impingement and entrainment studies for the Barker Slough Diversion, which is referenced as the NBA in Permit Condition 8.4, but the Biological Opinion does not have requirements for RRDS or SIDS.</p> <p>e. Subject to Section 2(d), DWR shall fund and the Contractors shall reimburse DWR for the reasonable, expected and typical costs associated with implementing the Longfin Science Program, including the costs associated with retaining any consultants needed for implementation of any of the studies ("Program Costs"), except for Task 4 on page 24 of the Longfin Science Program; provided, however, that should Program Costs exceed or be reasonably expected to exceed the projected costs set forth in Table 2 of Exhibit 1 attached hereto or in any updated budgets prepared by and unanimously agreed to by the Technical Team during implementation of the Longfin Science Program, each Party shall have the right to approve such revised costs before proceeding or continuing with the subject study or studies. The Contractors shall fund Task 4 of the Longfin Science Program.</p> <p>f. In any future California Endangered Species Act permitting regarding the SWP and Longfin, DFW shall consider the results of the Longfin Science Program in connection with its review of the best scientific and other information reasonably available at the time.</p>	Based on the Litigation documentation DWR is named.	One Time	3/1/2014
				On-Going	Bi-Annually

CDFW					
Condition 1	Conditions of Approval	Permittee shall comply with all applicable state, federal, and local laws in existence on the effective date of this Permit or adopted thereafter	all ITPs are DWR Only, no languaged captured	One Time	12/31/2018
Condition 2	Conditions of Approval	Permittee shall implement and adhere to the measures in the Negative Declaration and Initial Study adopted by the Department of Water Resources on February 18, 2009	all ITPs are DWR Only, no languaged captured	One Time	2/23/2009
Condition 3	Conditions of Approval	Permittee shall fully implement and adhere to the conditions of this Permit within the time frames set forth in Attachment B, the Mitigation Monitoring and Reporting Program (MMRP) required for the Permit	all ITPs are DWR Only, no languaged captured	One Time	NOTE: Attachment B is a summary of all the CDFW Biops, but listed in a table format
Condition 4	Conditions of Approval	This Permit may require an amendment if there is any modification to the U.S. Fish and Wildlife Service (FWS) Delta Smelt Biological Opinion of the Operating Criteria and Plan for the Coordinated Operations of the CVP and SWP that the FWS issued on December 16, 2008 (OCAP Biological Opinion) or if an unanticipated emergency condition, such as a drought, arises that imposes a serious threat to public health or safety.	all ITPs are DWR Only, no languaged captured	On-Going	When there is a drought or unanticipated Emergency Condition
Condition 5.1	Flow Measures	<p>“This Condition is not likely to occur in many years.”</p> <p>To protect adult longfin smelt migration and spawning during the December through February period, the Smelt Working Group (SWG) or DFG SWG personnel shall provide Old and Middle River (OMR) flow advice to the Water Operations Management Team (WOMT) and to Director of DFG (Director) weekly.</p>	all ITPs are DWR Only, no languaged captured	On-Going	Annually (December - February)
					When flows go below 40,000 cfs in the Sacramento River at Rio Vista or 5,000 cfs in the San Joaquin River at Vernalis.
					When given a recommendation by DFG to WOMT
					When river flows are greater than 55,000 cfs in the Sacramento River at Rio Vista
					When river flows are greater than 8,000 cfs in the San Joaquin River at Vernalis.
					When spawning is detected in the system
Condition 5.2	Flow Measures	To protect larval and juvenile longfin smelt during the January through June period, the SWG or DFG SWG personnel shall provide OMR flow advice to the WOMT and to the Director weekly.	all ITPs are DWR Only, no languaged captured	On-Going	Annually (January - June)
					When given a recommendation by DFG to WOMT
					When river flows are greater than 55,000 cfs in the Sacramento River at Rio Vista
					When river flows are greater than 8,000 cfs in the San Joaquin River at Vernalis
					When spawning is detected in the system
					When the flows go below 40,000 cfs in the Sacramento River at Rio Vista or 5,000 cfs in the San Joaquin River at Vernalis
Condition 5.3	Flow Measures	To protect larval longfin smelt shall apply January 15 through March 31 of dry and critically dry years, as defined in D-1641 for the Sacramento River.	all ITPs are DWR Only, no languaged captured	On-Going	Annually (After January 1: If the Water Year type changes to below normal, above normal, or wet)
					Annually (After January 31: If the Water Year type changes to dry or critical)
					Annually (January 15 - March 31)
					When larval longfin smelt are not longer detected at Stations 716
					When there are critically dry years as defined in D-1641 for the Sacramento River.
					When there are dry years as defined in D-1641 for the Sacramento River.
Condition 6.1	Additional Minimization Measures	To minimize take of longfin smelt at MDS diversion, in addition to any existing operating rules	all ITPs are DWR Only, no languaged captured	One Time	2/23/09 (Within 1 Year of Permit Issuance)
					8/23/09 (Within 6 Months of Permit Issuance)
					9/1/2010
				On-Going	Annually (August 15)
					Annually (September 1 - December 31)
Condition 6.2	Additional Minimization Measures	To ensure the minimization measures designed to minimize take of the Covered Species are effective.	all ITPs are DWR Only, no languaged captured	One Time	5/23/2009 (Within 3 Months of Permit Issuance)
					TBD (After Plan has been Approved)
Condition 6.2.1	Additional Minimization Measures	Improve the survival rates of longfin salvage at the Skinner Facility	all ITPs are DWR Only, no languaged captured	One Time	2/23/2009 (Within 1 Year of the Permit Issuance)
					TBD (Upon approval by DFG and compliance with any applicable law including CEQA)
Condition 6.3	Additional Minimization Measures	minimization measures to protect longfin smelt	all ITPs are DWR Only, no languaged captured	On-Going	Annually (November 1 - June 30)
Condition 6.3.1	Additional Minimization Measures	Unplanned salvage outages greater than 1 hour	all ITPs are DWR Only, no languaged captured	On-Going	Annually (November 1 - June 30)
Condition 6.3.2	Additional Minimization Measures	For all planned salvage outages to be conducted for normal maintenance and repair work (e.g., predator clean-outs, normal maintenance procedures, repairs to valves and controls)	all ITPs are DWR Only, no languaged captured	On-Going	Annually (November 1 - June 30)
Condition 6.3.3	Additional Minimization Measures	Export rates shall not increase during any outage period.	all ITPs are DWR Only, no languaged captured	On-Going	Annually (November 1 - June 30)
Condition 6.4	Additional Minimization Measures	To ensure the minimization measures designed to minimize take of the Covered Species are effective	all ITPs are DWR Only, no languaged captured	One Time	05/23/2009 (Within 3 Months of Permit Issuance)
				On-Going	After the plan is approved by DFG
					Annually (November 1 - June 30)
Condition 7.1	Measures That Contribute to Full Mitigation	<p>DFG has determined that permanent protection of inter-tidal and associated sub-tidal wetland habitat to enhance longfin smelt water habitat is necessary and required under CESA to fully mitigate the impacts of the taking on the Covered Species that will result with implementation of the Project.</p> <p>7.1: To improve overall habitat quality for longfin smelt in the Bay Delta Estuary. This condition is intended to provide benefits supplemental to the benefits resulting from the flow requirements described in Condition 5.</p>	all ITPs are DWR Only, no languaged captured	One Time	03/xx/2009 (if longfin smelt are not listed by the Fish and Game Commission at the March 2009 meeting)
					2/23/2011 (Within 2 Years of Permit Issuance)

Condition 7.1	Measures That Contribute to Full Mitigation	DFG has determined that permanent protection of inter-tidal and associated sub-tidal wetland habitat to enhance longfin smelt water habitat is necessary and required under CESA to fully mitigate the impacts of the taking on the Covered Species that will result with implementation of the Project.	all ITPs are DWR Only, no language captured	One Time	2/23/2011 (Within 2 Years of Permit Issuance)
					2/23/2013 (Within 4 Years of Permit Issuance)
					2/23/2015 (Within 6 Years of Permit Issuance)
					2/23/2017 (Within 8 Years of Permit Issuance)
					2/23/2019 (Within 10 Years of Permit Issuance)
Condition 7.2 (1 - 3)	Measures That Contribute to Full Mitigation	<p>7.2 DFG's approval of the Mitigation Lands (Lands) must be obtained prior to acquisition and transfer by use of the Proposed Lands for Acquisition Form or by other means specified by DFG. As part of this Condition, Permittee shall:</p> <p>7.2.1 Transfer fee title to the Lands, convey a conservation easement, or provide another mechanism approved by DFG over the Lands to DFG under terms approved by DFG. Alternatively, a conservation easement over the Lands may be conveyed to a DFG-approved non-profit organization qualified pursuant to California Government Code section 65965, with DFG named as a third party beneficiary under terms approved by DFG.</p> <p>7.2.2 Provide a recent preliminary title report, initial Phase 1 report, and other necessary documents. All documents conveying the Lands and all conditions of title are subject to the approval of DFG, and, if applicable, the Department of General Services.</p> <p>7.2.3 Reimburse DFG for reasonable expenses incurred during title and documentation review, expenses incurred from other state agency reviews, and overhead related to transfer of the Lands to DFG. DFG estimates that this Project will create an additional cost to DFG of no more than \$3,000 for every fee title deed or easement processed.</p>	all ITPs are DWR Only, no language captured	One Time	2/23/2009
					2/23/2011 (Within 2 Years of Permit Issuance)
					2/23/2013 (Within 4 Years of Permit Issuance)
					2/23/2015 (Within 6 Years of Permit Issuance)
					2/23/2017 (Within 8 Years of Permit Issuance)
					2/23/2019 (Within 10 Years of Permit Issuance)
					TBD (DWR proposes land for acquisition)

Condition 7.3	Measures That Contribute to Full Mitigation	Objective: Evaluation of all land acquired for the purposes of implementing this Condition	all ITPs are DWR Only, no languaged captured	One Time	2/23/2011 (Within 2 Years of Permit Issuance)
					2/23/2013 (Within 4 Years of Permit Issuance)
					2/23/2015 (Within 6 Years of Permit Issuance)
					2/23/2017 (Within 8 Years of Permit Issuance)
					2/23/2019 (Within 10 Years of Permit Issuance)
Condition 8	Monitoring and Reporting	Permittee shall ensure that information is gathered and reported to ensure proper implementation of the Conditions of Approval of the Permit, that the intended physical results of these Conditions are achieved, and that appropriate and adequate information is gathered to evaluate the effectiveness of these actions on the targeted life stages of longfin smelt so that the actions can be refined, if needed.	all ITPs are DWR Only, no languaged captured	On-Going	Daily
Condition 8.1	Monitoring and Reporting	Permittee shall fund its share of the Interagency Ecological Program to continue the following existing monitoring efforts, all of which are key to monitor the Covered Species response to Project operations and the Conditions of Approval of this Permit. These include sampling of the FMWT, Spring Kodiak Trawl, 20- mm Survey, Smelt Larval Survey, and Bay Study.	all ITPs are DWR Only, no languaged captured	On-Going	Annually
Condition 8.2	Monitoring and Reporting	Permittee shall fund additional monitoring related to the extent of the incidental take of longfin smelt and the effectiveness of the minimization measures. Immediate needs include extension of the time period of the existing smelt larval surveys into April to cover the period of larval presence in the system to measure the effectiveness of the OMR flow requirements for entrainment reduction of longfin smelt larvae. Funds required shall cover additional staff and equipment that are reasonably needed for such monitoring.	all ITPs are DWR Only, no languaged captured	On-Going	Annually
Condition 8.3	Monitoring and Reporting	Permittee shall ensure essential information on salvage at the Skinner Facility continues to be collected and reported.	all ITPs are DWR Only, no languaged captured	On-Going	Annually (December - June)
					Annually (December 1)
					Daily
					Trigger (December - June: If the presence of large number of fish or debris in the salvage will result in the significant loss of listed species in the salvage monitoring process)
Condition 8.4	Monitoring and Reporting	Permittee shall develop and implement an effectiveness and performance monitoring program for the fish screens at the NBA, RRDS and Sherman Island diversions	all ITPs are DWR Only, no languaged captured	One Time	05/23/09 (Within 3 Months of the Permit Issuance)
					TBD
				On-Going	Annually (November - June)
Condition 8.5	Monitoring and Reporting	Permittee shall develop and implement an effectiveness monitoring program for the Skinner Facility	all ITPs are DWR Only, no languaged captured	One Time	05/23/09 (Within 3 Months of the Permit Issuance)
					TBD
				On-Going	Daily
Condition 9	Funding Assurance	To the extent authorized under California law, Permittee shall fully fund all expenditures required to implement minimization and mitigation measures and to monitor compliance with and effectiveness of those measures, as well as all other related costs.	all ITPs are DWR Only, no languaged captured	One Time	
Condition 9.1	Funding Assurance	Permittee shall provide sufficient funding for perpetual management and monitoring activities on the required compensatory habitat lands (Lands) identified in Condition 7.	all ITPs are DWR Only, no languaged captured	One Time	2/23/2011 (Within 2 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)
					2/23/2013 (Within 4 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)
					2/23/2015 (Within 6 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)
					2/23/2017 (Within 8 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)

Condition 9.1	Funding Assurance	Permittee shall provide sufficient funding for perpetual management and monitoring activities on the required compensatory habitat lands (Lands) identified in Condition 7.	all ITPs are DWR Only, no languaged captured	One Time	2/23/2017 (Within 8 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)
					2/23/2019 (Within 10 Years of Permit Issuance & Land Parcel Identified and funding needs to be acquired)
Condition 9.2	Funding Assurance	Permittee may proceed with the Project before completing all of the required mitigation (including acquisition of Mitigation Lands), monitoring, and reporting activities only if Permittee ensures funding to complete those activities by providing funding assurance to DFG.	all ITPs are DWR Only, no languaged captured	One Time	02/23/2011 (2 Years after the Permit Effective Date)
					02/23/2013 (4 Years after the Permit Effective Date)
					02/23/2015 (6 Years after the Permit Effective Date)
					02/23/2017 (8 Years after the Permit Effective Date)
					02/23/2019 (10 Years after the Permit Effective Date)
					05/23/09 (Within 3 Months after the Permit Effective Date)



USFWS					
RPM 2: T&C 1	Reasonable and Prudent Measures: Minimize adverse effects of operations of the NBA.	The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:  2. Minimize adverse effects of operations of the NBA.	"Reclamation shall ensure compliance with the following terms and conditions" p 294	One Time	2/9/2009
				On-Going	Annually (January - June)
Grand Total					

## **Exhibit C**

Summary of USBR Only BIOPS

Split	USBR Only
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NMFS			
11.2.1.1 (1 - 9)	Responsibilities and Procedures of Technical Teams	<p>recommendations for adjusting operations to meet contractual obligations for water delivery and minimize adverse effects on listed anadromous fish species:</p> <ul style="list-style-type: none"> <li>• Sacramento River Temperature Task Group (SRTTG)</li> <li>• Clear Creek Technical Working Group (CCTWG)</li> <li>• American River Group (ARG)</li> <li>• San Joaquin River Technical Committee (SJRTC)</li> </ul> <p>This RPA requires the creation of three additional technical teams:</p> <ul style="list-style-type: none"> <li>• Delta Operations for Salmon and Sturgeon (DOSS) Group</li> <li>• Stanislaus Operations Group (SOG)</li> <li>• Interagency Fish Passage Steering Committee</li> </ul> <p>Each group has responsibility to gather and analyze information, and make recommendations, regarding adjustments to water operations within the range of flexibility prescribed in the implementation procedures for a specific action in their particular geographic area. Under previous operations plans, recommendations for adjustments were made to the Water Operations Management Team (WOMT), a management-level group of representatives of Reclamation, DWR, CDFG, NMFS, and USFWS. The WOMT then made recommendations to state and regional directors for final action. The Project Description for the proposed action (Appendix 1 to this Opinion), as revised by this RPA, establishes the responsibilities of each technical team. The RPA establishes the operations parameters that are necessary to avoid jeopardizing listed species or adversely modifying their critical habitat. Within these parameters, there is flexibility to adjust actions within a specified "implementation procedures" portion of the RPA action. The technical teams and the WOMT will work within these implementation procedures to meet discretionary water contract obligations to the greatest extent consistent with survival and recovery of listed species. The teams also may recommend changes to the measures in this RPA, as detailed in the Research and Adaptive Management section of the RPA. Recommended changes outside the range of flexibility specified in the implementation procedures must receive written review and concurrence by NMFS and may trigger re-initiation. This action prescribes standard operating procedures for decision-making that will apply to all teams.</p> <p>1) Within 90 days of issuance of this Opinion, Reclamation shall send to the WOMT members a list of current members of each technical team. The WOMT representatives shall review the membership and make changes, if necessary. All groups shall include members with expertise in fish biology and hydrology. Each group shall designate a group leader to convene meetings and assure that necessary administrative steps are taken, such as recording and distributing meeting notes and recommendations.</p> <p>2) Each group shall establish a regular meeting schedule at the beginning of each year, based on the anticipated need for adjustments to operations, and distribute the schedule to the members of the group. The group leader may reschedule a meeting, or call a special meeting, with three days notice at his or her discretion, or on request of NMFS or any two or more group members.</p> <p>3) Brief notes of each meeting shall be recorded, including issues considered, recommendations made, and key information on which recommendations were based. Meeting notes shall be distributed to members within two days of the meeting.</p>	Reclamation shall p 582
11.2.1.2 (1 - 5)	Research and Adaptive Management	<p>other Science Peer Review process, Reclamation and NMFS shall host a workshop to review the prior water years' operations and to determine whether any measures prescribed in this RPA should be altered in light of information learned from prior years' operations or research. After completion of the annual review, NMFS may initiate a process to amend specific measures in this RPA to reflect new information, provided that the amendment is consistent with the Opinion's underlying analysis and conclusions and does not limit the effectiveness of the RPA in avoiding jeopardy to listed species or adverse modification of critical habitat. NMFS will ask the appropriate informational and technical teams to assess the need for a particular amendment and make recommendations to NMFS, according to the group processes for decision-making set forth in this RPA in action 11.2.1.1 above. Science Program and other agencies to address key research and management questions arising from this Opinion. Prior to the beginning of a new calendar year, Reclamation shall submit to NMFS a research plan for the following year, developed in coordination with the above programs and agencies. Reclamation also shall provide NMFS access to all draft and final reports associated with this research. Specific research projects that have been identified as important to begin in the first year and complete as soon as possible are:</p> <ol style="list-style-type: none"> <li>1) Cooperative development of a salmonid lifecycle model acceptable to NMFS, Reclamation, CDFG, and DWR</li> <li>2) Temperature monitoring and modeling identified in RPA Action 1.5</li> <li>3) Green sturgeon research described in the RBDD actions</li> <li>4) Rearing habitat evaluation metrics to guide rearing habitat Action 1.6</li> <li>5) A 6-year acoustic-tagged study of juvenile salmonids out-migration in the San Joaquin River and through the southern Delta identified in Action IV 2.2.</li> </ol>	Reclamation and NMFS shall host p 583
11.2.1.3 (7)	Monitoring and Reporting	7) Reclamation shall coordinate with NMFS, the USFWS, and CDFG to continue implementation and funding of fisheries monitoring of spring-run and CV steelhead (including adult snorkel surveys, population estimates for steelhead, and rotary screw trapping) in Clear Creek to aids in determining the benefits and effects of flow and temperature management.	Reclamation shall coordinate
11.2.2: Action 1.1 (Suite)	Clear Creek	Suite Objective: The proposed action includes a static flow regime (no greater than 200 cfs all year) and uncertainty as to the availability of b(2) water in the future pose significant risk to these species. The RPA actions described below were developed based on a careful review of past flow studies, current operations, and future climate change scenarios. Although not all of the flow studies have been completed, NMFS believes these actions are necessary to address adverse project effects on flow and water temperature that reduce the viability of spring-run and CV steelhead in Clear Creek.	Reclamation shall p 587 -
11.2.2: Action 1.1.1	Spring Attraction Flows	Objective: Encourage spring-run movement to upstream Clear Creek habitat for spawning.	Reclamation shall annually conduct p 587
11.2.2: Action 1.1.2	Channel Maintenance Flows	Objective: Minimize project effects by enhancing and maintain previously degraded spawning habitat for spring-run and CV steelhead	Reclamation shall re-operate p 588
11.2.2: Action 1.1.3	Spawning Gravel Augmentation	Objective: Enhance and maintain previously degraded spawning habitat for spring-run and CV steelhead.	Reclamation, in coordination with the Clear Creek Technical team, shall p 588
11.2.2: Action 1.1.4	Spring Creek Temperature Control Curtain	Objective: Reduce adverse impacts of project operations on water temperature for listed salmonids in the Sacramento River.  (Note: This action benefits Sacramento River conditions, but is part of Clear Creek operations)	Reclamation shall replace p 589
11.2.2: Action 1.1.5	Thermal Stress Reduction	Objective: To reduce thermal stress to over-summering steelhead and spring-run during holding, spawning, and embryo incubation.	Reclamation shall manage p589
11.2.2: Action 1.1.6	Adaptively Manage to Habitat Suitability/FIM Study Results	Objective: Decrease risk to Clear Creek spring-run and CV steelhead population through improved flow management designed to implement state-of-the-art scientific analysis on habitat suitability.	Reclamation shall operate p 589
11.2.2: Action 1.2.1	Performance Measures.	Objective: To establish and operate to a set of performance measures for temperature compliance points and End-of-September (EOS) carryover storage, enabling Reclamation and NMFS to assess the effectiveness of this suite of actions over time. Performance measures will help to ensure that the beneficial variability of the system from changes in hydrology will be measured and maintained.	Reclamation shall track p 592
11.2.2: Action 1.2.2.A	Implementation Procedures for EOS Storage at 2.4 MAF and Above	Minimize impacts to listed species and naturally spawning non-listed fall-run from high water temperatures by implementing standard procedures for release of cold water from Shasta Reservoir.	Reclamation shall convene p 593
11.2.2: Action 1.2.2.B	Implementation Procedures for EOS Storage Above 1.9 MAF and Below 2.4 MAF	Minimize impacts to listed species and naturally spawning non-listed fall-run from high water temperatures by implementing standard procedures for release of cold water from Shasta Reservoir.	Reclamation shall convene p 594
11.2.2: Action 1.2.2.C	Implementation and Exception Procedures for EOS Storage of 1.9 MAF or Below	Minimize impacts to listed species and naturally spawning non-listed fall-run from high water temperatures by implementing standard procedures for release of cold water from Shasta Reservoir.	Reclamation shall: p 595
11.2.2: Action 1.2.3	February Forecast: March - May 14 Keswick Release Schedule (Spring Actions)	Objective: To conserve water in Shasta Reservoir in the spring in order to provide sufficient water to reduce adverse effects of high water temperature in the summer months for winter-run, without sacrificing carryover storage in the fall.	Reclamation shall make p 597
11.2.2: Action 1.2.3.A	Implementation Procedures if February Forecast, Based on 90 Percent Hydrology, Shows that Balls Ferry Temperature Compliance Point and 2.2 MAF EOS are Both Achievable	NMFS will review the draft February forecast to determine whether both a temperature compliance point at Balls Ferry during the temperature control season (May - October), and EOS storage of at least 2.2 MAF, is likely to be achieved. If both are likely, then Reclamation shall announce allocations and operate Keswick releases in March, April, and May consistent with its standard plan of operation. Preparation of a separate Keswick release schedule is not necessary in these circumstances.	Reclamation shall announce p 598
11.2.2: Action 1.2.3.B	Implementation Procedures if February Forecast, Based on 90 Percent Hydrology, Shows that Only Balls Ferry Compliance or 2.2 MAF EOS, but Not Both, Is Achievable	Objective: It is necessary to manage storage for potential dry years, to reduce adverse effects on winter-run egg incubation in summer months, and on spring-run in fall months. According to information provided by Reclamation, the hydrology is too variable this time of year to provide for a meaningful 3-month release schedule. Instead, monthly consultations between NMFS and Reclamation are needed to ensure that operations are based on biological criteria.	Reclamation shall reduce p 598
11.2.2: Action 1.2.3.C	Drought Exception Procedures if February Forecast, Based on 90 Percent Hydrology, Shows that Clear Creek Temperature Compliance Point or 1.9 MAF EOS Storage is Not Achievable	<p>Objective: In these circumstances, there is a one-in-ten likelihood that minimal requirements for winter-run egg survival will not be achieved due to depletion of the cold water pool, resulting in temperature-related mortality of winter-run and, in addition, most likely contributing to temperature-related mortality of spring-run spawning in the fall. This is a conservative forecast, since there is a 90 percent probability that conditions will improve. However, the effects analysis in this Opinion concludes that these poor conditions could be catastrophic to the species, potentially leading to a significant reduction in the viability of winter-run. Delta objectives (salinity, X2, E/I ratio, OMR flow restrictions for both smelt and salmon) are also controlling at this time of year. There is potential for conflict between the need to maintain storage at Shasta and other legal and ecological requirements. Consequently, it is necessary to immediately limit releases from Shasta and develop a contingency plan.</p> <p>Notification to the State Water Resources Control Board (SWRCB) is essential. Sacramento Settlement Contract withdrawal volumes from the Sacramento River can be quite substantial during these months. The court has recently concluded that Reclamation does not have discretion to curtail the Sacramento Settlement contractors to meet Federal ESA requirements. Therefore, NMFS is limited in developing an RPA that minimizes take to acceptable levels in these circumstances. Consequently, other actions are necessary to avoid jeopardy to the species, including fish passage at Shasta Dam in the long term.</p> <p>Separate from this consultation, NMFS will work with the SWRCB to determine whether contingency plans within the Board's authority are warranted, and to assist in developing such plans that will allow Reclamation to meet ESA requirements. The incidental take statement for this Opinion also provides limitations of ESA incidental take coverage for Settlement Contractors under the terms of this Opinion.</p>	Reclamation shall follow p 600
11.2.2: Action 1.2.4	Action 1.2.4 May 15 Through October Keswick Release Schedule (Summer Action)	Objective: To manage the cold water storage within Shasta Reservoir and make cold water releases from Shasta Reservoir to provide suitable habitat temperatures for winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon in the Sacramento River between Keswick Dam and Bend Bridge, while retaining sufficient carryover storage to manage for next year's cohorts. To the extent feasible, manage for suitable temperatures for naturally spawning fall-run.	Reclamation shall develop and implement p 601
11.2.2: Action 1.2.6	Restore Battle Creek for Winter-Run, Spring-Run, and CV Steelhead	Objective: To partially compensate for unavoidable adverse effects of project operations by restoring winter-run and spring-run to the Battle Creek watershed. A second population of winter-run would reduce the risk of extinction of the species from lost resiliency and increased vulnerability to catastrophic events.	Reclamation shall direct p 603

11.2.2: Action I.3 (Suite)	Red Bluff Diversion Dam (RBDD) Operations	Objectives: Reduce mortality and delay of adult and juvenile migration of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon caused by the presence of the diversion dam and the configuration of the operable gates. Reduce adverse modification of the passage element of critical habitat for these species. Provide unimpeded upstream and downstream fish passage in the long term by raising the gates year-round, and minimize adverse effects of continuing dam operations, while pumps are constructed replace the loss of the diversion structure.	Reclamation shall operate/ retain / continue / provide / convene / screen p 604 - 607
11.2.2: Action I.3.1	Operations after May 14, 2012: Operate RBDD with Gates Out	Objectives: Reduce mortality and delay of adult and juvenile migration of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon caused by the presence of the diversion dam and the configuration of the operable gates. Reduce adverse modification of the passage element of critical habitat for these species. Provide unimpeded upstream and downstream fish passage in the long term by raising the gates year-round, and minimize adverse effects of continuing dam operations, while pumps are constructed replace the loss of the diversion structure.	Reclamation shall operate p 604
11.2.2: Action I.3.2	Interim Operations	Objectives: Reduce mortality and delay of adult and juvenile migration of winter-run, spring-run, CV steelhead, and Southern DPS of green sturgeon caused by the presence of the diversion dam and the configuration of the operable gates. Reduce adverse modification of the passage element of critical habitat for these species. Provide unimpeded upstream and downstream fish passage in the long term by raising the gates year-round, and minimize adverse effects of continuing dam operations, while pumps are constructed replace the loss of the diversion structure.	Reclamation shall operate p 604
11.2.2: Action I.3.3	Interim Operation for Green Sturgeon	Objective: Allow passage of green sturgeon during interim operations.	Reclamation shall retain p 605
11.2.2: Action I.3.4	Measures to Compensate for Adverse Effects of Interim Operations on Green Sturgeon	Objective: Offset short-term effects to green sturgeon due to interim gate operations by investing in geographically specific research needed to determine green sturgeon life history and recovery needs.	Reclamation shall continue p 605
11.2.2: Action I.3.5	Measures to Compensate for Adverse Effects of Interim Operations on Spring-Run	Objective: Offset unavoidable short-term effects to spring-run from passage impediments of RBDD by restoring spring-run passage elsewhere in the Sacramento River system.	Reclamation shall provide p 606
11.2.2: Action I.4	Wilkins Slough Operations	Objective: Enhance the ability to manage temperatures for anadromous fish below Shasta Dam by operating Wilkins Slough in the manner that best conserves the dam's cold water pool for summer releases.	Reclamation shall convene p 606
11.2.2: Action I.5	Funding for CYPHA Anadromous Fish Screen Program (AFSP)	Objective: To reduce entrainment of juvenile anadromous fish from unscreened diversions.	Reclamation shall screen p 607
11.2.2: Action II.1	Lower American River Flow Management	Objective: To provide minimum flows for all steelhead life stages.	Reclamation shall ensure p 613
11.2.2: Action II.2	Lower American River Temperature Management	Objective: Maintain suitable temperatures to support over-summer rearing of juvenile steelhead in the lower American River.	Reclamation shall prepare p 614
11.2.2: Action II.3	Structural Improvements	Objective: Improve the ability to manage the cold water pool to provide suitable temperatures for listed fish through physical and structural improvements at the dams.	Reclamation shall evaluate p 615
11.2.2: Action II.4	Minimize Flow Fluctuation Effects	Objective: Reduce stranding and isolation of juvenile steelhead through ramping protocols.	
11.2.2: Action II.5	Fish Passage at Nimbus and Folsom Dams	Objective: Provide access for steelhead to historic cold water habitat above Nimbus and Folsom dams.	Reclamation shall coordinate p 617
11.2.2: Action II.6 (Suite)	Implement the Following Actions to Reduce Genetic Effects of Nimbus and Trinity River Fish Hatchery Operations	The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing introgression of out-of-basin hatchery stock with wild steelhead populations in the Central Valley, including the American River population and other populations in the Sacramento River system (Garza and Pearse 2008). In addition, actions are necessary at both Nimbus and Trinity River fish hatcheries to increase diversity of fall-run production, in order to increase the likelihood of prey availability for Southern Residents and reduce adverse effects of hatchery fall-run straying on genetic diversity of natural fall-run and spring-run.	Based on Location this is a USBR BIOP See subsections for language p 618
11.2.2: Action II.6.1	Preparation of Hatchery Genetic Management Plan (HGMP) for Steelhead	Objective of Actions II.6.1-3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing introgression of out-of-basin hatchery stock with wild steelhead populations in the Central Valley, including the American River population and other populations in the Sacramento River system (Garza and Pearse 2008). In addition, actions are necessary at both Nimbus and Trinity River fish hatcheries to increase diversity of fall-run production, in order to increase the likelihood of prey availability for Southern Residents and reduce adverse effects of hatchery fall-run straying on genetic diversity of natural fall-run and spring-run.	Reclamation shall fund p 618
11.2.2: Action II.6.2	Interim Actions Prior to Submit of Draft HGMP for Steelhead	Objective of Actions II.6.1-3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing introgression of out-of-basin hatchery stock with wild steelhead populations in the Central Valley, including the American River population and other populations in the Sacramento River system (Garza and Pearse 2008). In addition, actions are necessary at both Nimbus and Trinity River fish hatcheries to increase diversity of fall-run production, in order to increase the likelihood of prey availability for Southern Residents and reduce adverse effects of hatchery fall-run straying on genetic diversity of natural fall-run and spring-run.	Reclamation shall use p 618
11.2.2: Action II.6.3	Develop and Implement Fall-run Chinook Salmon Hatchery Management Plans for Nimbus and Trinity River Fish Hatcheries	Objective of Actions II.6.1-3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing introgression of out-of-basin hatchery stock with wild steelhead populations in the Central Valley, including the American River population and other populations in the Sacramento River system (Garza and Pearse 2008). In addition, actions are necessary at both Nimbus and Trinity River fish hatcheries to increase diversity of fall-run production, in order to increase the likelihood of prey availability for Southern Residents and reduce adverse effects of hatchery fall-run straying on genetic diversity of natural fall-run and spring-run.	Reclamation shall fund p 618
11.2.2: Action III.1.1	Establish Stanislaus Operations Group for Real-Time Operational Decision-Making as Described in These Actions and Implementation Procedures	Objective: None Listed	Reclamation shall create p 620
11.2.2: Action III.1.2	Provide Cold Water Releases to Maintain Suitable Steelhead Temperatures	Objective: None Listed	Reclamation shall manage p 620
11.2.2: Action III.1.3	Operate the East Side Division Dams to Meet the Minimum Flows, as Measured at Goodwin Dam, Characterized in Figure 11-1, and as Specified in Appendix 2.E	Objective: To maintain minimum base flows to optimize CV steelhead habitat for all life history stages and to incorporate habitat maintaining geomorphic flows in a flow pattern that will provide migratory cues to smolts and facilitate out-migrant smolt movement on declining limb of pulse.	Reclamation shall operate p 623
11.2.2: Action III.2 (Suite)	Stanislaus River CV Steelhead Habitat Restoration operations.	Overall objective: Dam operations have and will continue to suppress channel-forming flows that replenish spawning beds. The physical presence of the dams impedes normal sediment transportation processes. This action is necessary to partially alleviate adverse modification of steelhead critical habitat from operations.	Based on Location this is a USBR BIOP
11.2.2: Action III.2.1	Increase and Improve Quality of Spawning Habitat with Addition of 50,000 Cubic Yards of Gravel by 2014 and with a Minimum Addition of 5,000 Cubic Yards per Year for the Duration of the Project Actions	Objective: None Listed	Reclamation shall minimize p 626
11.2.2: Action III.2.2	Conduct Floodplain Restoration and Inundation Flows in Winter or Spring to Inundate Steelhead Juvenile Rearing Habitat on One- to Three-Year Schedule.	Objective: None Listed	Reclamation shall seek p 627
11.2.2: Action III.2.3	Restore Freshwater Migratory Habitat for Juvenile Steelhead by Implementing Projects to Increase Floodplain Connectivity and to Reduce Predation Risk During Migration	Objective: This action is necessary to compensate for continued operational effects on rearing and freshwater migratory habitat due to flood control operations. The goal of this action is to improve habitat quality of freshwater migratory habitat for juvenile steelhead.	Reclamation shall develop p 627
11.2.2: Action III.2.4	Evaluate Fish Passage at New Melones, Tulloch, and Goodwin Dams	Objective: Evaluate access for steelhead to historic cold water habitat above New Melones, Tulloch, and Goodwin dams.	Based on Location this is a USBR BIOP
11.2.2: Action IV.4.1	Tracy Fish Collection Facility (TFCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at Federal facilities.  Action: Reclamation shall undertake the following actions at the TFCF to reduce pre-screen loss and improve screening efficiency: 1) By December 31, 2012, improve the whole facility efficiency for the salvage of Chinook salmon, CV steelhead, and Southern DPS of green sturgeon so that overall survival is greater than 75 percent for each species.  a) By December 31, 2011, Reclamation shall complete studies to determine methods for removal of predators in the primary channel, using physical and non-physical removal methods (e.g., electricity, sound, light, CO2, leading to the primary lower screens with the goal of reducing predation loss to ten percent or less. Findings shall be reported to NMFS within 90 days of study completion. By December 31, 2012, Reclamation shall implement measures to reduce pre-screen predation in the primary channel to less than ten percent of exposed salmonids.  b) By March 31, 2011, Reclamation shall complete studies for the re-design of the secondary channel to enhance the efficiency of screening, fish survival, and reduction of predation within the secondary channel structure and report study findings to NMFS. NMFS shall review study findings and if changes are deemed feasible, Reclamation shall initiate the implementation of the study findings by January 31, 2012.  c) No later than June 2, 2010, Reclamation shall submit to NMFS, one or more potential solutions to the loss of Chinook salmon and green sturgeon associated with the cleaning and maintenance of the primary lower and secondary lower systems at the TFCF. In the event that a solution acceptable to NMFS is not in place by June 2, 2011, pumping at the Tracy Pumping Plant shall cease during lower cleaning and maintenance operations to avoid loss of fish during these actions. 655  2) By December 31, 2011, Reclamation shall implement operational procedures to optimize the simultaneous salvage of juvenile salmonids and Delta smelt at the facility.  3) Immediately upon issuance of this biological opinion, Reclamation shall begin removing predators in the secondary channel at least once per week. By June 2, 2010, Reclamation shall install equipment to monitor for the presence of predators in secondary channel during operations. This could include an infrared or low light charged coupled device camera or acoustic beam camera mounted within the secondary channel.  4) Reclamation shall operate the facility to meet design criteria for lower bypasses and channel flows at least 75 percent efficiency.  5) Reclamation shall maintain a head differential at the trash rack of less than 1.5 ft. between the ambient Old River water surface elevation and the primary intake channel at all times.  6) By January 2, 2010, Reclamation shall install and maintain flow meters in the primary and secondary channels to continuously monitor and record the flow rates in the channel. Deviations from design flow criteria shall initiate immediate corrective measures to remedy deficiencies and return channel flows to design flow specifications.	Reclamation shall complete / submit p 654
11.2.2: Action V: LF 1	Long-term Funding and Support for the Interagency Fish Passage Steering Committee.	If the Comprehensive Fish Passage Report indicates that long-term fish passage is feasible and desirable, Reclamation shall continue to convene, fund, and staff the Fish Passage Steering Committee.	Reclamation shall continue to convene, fund, and staff p 669
11.2.2: Action V: LF 2 (Suite)	Long-term Fish Passage Program	Objective: Provide structural and operational modifications to allow safe fish passage and access to habitat above and below Project dams in the Central Valley.	Reclamation, with assistance from the Steering Committee, shall develop p 669
11.2.2: Action V: LF 2.1	Construction and Maintenance of Adult and Juvenile Fish Passage Facilities	Construct long-term fish passage facilities necessary to successfully allow upstream and downstream migration of fish around or through project dams and reservoirs on the Sacramento and American Rivers by 2020, and Stanislaus River depending on results of study provided for in Action NF 4.7.	Reclamation shall construct p 671
11.2.2: Action V: LF 2.2	Development of Supplementation and Management Plan	develop and implement a long-term population supplementation plan for each species and fish passage location identified in V.	with the assistance of the Steering Committee, in consultation with the NMFS Southwest Fishery Science Center, Reclamation shall develop and implement p 671

11.2.2: Action V: LF 2.3	Construction and Maintenance of Long-term Adult and Juvenile Release Locations and Facilities.	The objective is to gather sufficient biological and technical information to assess the relative effectiveness of the program elements and determine the feasibility of long-term passage alternatives.	Reclamation, through the Steering Committee shall develop p 671	
11.2.2: Action V: LF 2.4	Development of Fish Passage Monitoring and Evaluation Plan	Development of Fish Passage Monitoring and Evaluation Plan Objective: none listed	? check with Derrick if these are shared	
11.2.2: Action V: NF 1	Formation of Interagency Fish Passage Steering Committee	Objective: To charter, and support through funding agreements, an interagency steering committee to provide oversight and technical, management, and policy direction for the Fish Passage Program.	Reclamation shall establish, chair and staff p 661	
11.2.2: Action V: NF 2	Evaluation of Habitat Above Dams	Objective: To quantify and characterize the location, amount, suitability, and functionality of existing and/or potential spawning and rearing habitat for listed species above dams operated by Reclamation.	Reclamation, shall conduct habitat evaluations p 661	
11.2.2: Action V: NF 3	Development of Fish Passage Pilot Plan	Objective: none listed	Reclamation, with assistance from the Steering Committee, shall complete p 662	
11.2.2: Action V: NF 4	Implementation of Pilot Reintroduction Program	Objective: To implement short-term fish passage actions that will inform the planning for long-term passage actions.	Reclamation shall begin to implement p 664	
11.2.2: Action V: NF 4.1	Adult Fish Collection and Handling Facilities	The objective is to provide interim facilities to pass fish above project facilities and reservoirs.	Reclamation, with assistance from the Steering Committee, shall design, construct, install, operate and maintain p 664 Reclamation shall provide p 665	
11.2.2: Action V: NF 4.2	Adult Fish Release Sites above Dams, and Juvenile Fish Sites Below Dams	Reclamation shall provide for the safe, effective, and timely release of adult fish above dams and juvenile fish below dams.		
11.2.2: Action V: NF 4.3	Capture, Trapping, and Relocation of Adults	NMFS considers volitional passage via a fish ladder or other fishway to be the preferable alternative in most circumstances. In the short term, upstream passage can be provided with fish trap and transport mechanisms, while Reclamation evaluates program effectiveness and passage alternatives.	Reclamation shall implement p 665	
11.2.2: Action V: NF 4.4	Interim Downstream Fish Passage through Reservoirs and Dams	Reclamation and partner agencies shall evaluate potential interim measures that require detailed environmental review, permits, or Congressional authorization as part of the Fish Passage Plan. Reclamation shall complete this component of the Plan by April 30, 2011, including seeking authorization (if necessary) and completing design or operational implementation plans for the selected operations. Measures to be evaluated include, but are not limited to, partial or full reservoir drawdown during juvenile outmigration period, modification of reservoir refill rates, and using outlets, sluiceways, and spillways that typically are not opened to pass outflow.	Reclamation shall carry out interim operational measures p 666	
11.2.2: Action V: NF 4.5	Juvenile Fish Collection Prototype	Objective: To determine whether the concept of a head-of-reservoir juvenile collection facility is feasible, and if so, to use head-of-reservoir facilities in Project reservoirs to increase downstream fish survival. Safe and timely downstream passage of juvenile Chinook salmon and juvenile and adult post-spawn steelhead is a critical component to the success of the Fish Passage Program.	Reclamation shall plan, design, build, and evaluate p 666	
11.2.2: Action V: NF 4.6	Pilot Program Effectiveness Monitoring and Evaluation	The objective is to gather sufficient biological and technical information to assess the relative effectiveness of the program elements and determine the feasibility of long-term passage alternatives. A final summary report of the 5-year pilot effort shall be completed by December 31, 2015.	Reclamation shall study, and provide p 667	
11.2.2: Action V: NF 4.7	Stanislaus River Fish Passage Assessment	Objective: To develop information needed in order to evaluate options for achieving fish passage on the Stanislaus River above Goodwin, Tulloch, and New Melones Dams.	Reclamation shall develop a plan p 667	
11.2.2: Action V: NF 5	Comprehensive Fish Passage Report	Objective: To evaluate the effectiveness of fish passage alternatives and make recommendations for the development and implementation of long-term passage alternatives and a long-term fish passage program.	Reclamation shall prepare p 668	
13.3 (2)	Reasonable and Prudent Measures	NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of winter-run, spring-run, CV steelhead, and the Southern DPS of green sturgeon. 2. Reclamation shall seek to develop an alternative technique to quantify incidental take of listed anadromous salmonid species at the Federal and State export facilities.	Reclamation shall seek p 781	
13.3 (3)	Reasonable and Prudent Measures	NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of winter-run, spring-run, CV steelhead, and the Southern DPS of green sturgeon. 3. Reclamation shall minimize the adverse effects of flow fluctuations associated with CVP-controlled stream operations on listed anadromous fish species spawning, egg incubation, and fry and juvenile rearing.	Reclamation shall minimize p 781	
13.4 (2 a)	Terms and Conditions	2. Reclamation shall seek to develop an alternative technique to quantify incidental take of listed anadromous salmonid species at the Federal and State export facilities. a. In coordination with NMFS, Reclamation shall select and fund an independent contractor to determine the best technique to quantify incidental take of winter-run, spring-run, CV steelhead, and the Southern DPS of green sturgeon at the Federal and State export facilities. Reclamation shall submit a final report to NMFS by December 31, 2010, summarizing the recommendations for quantifying incidental take, with the selection of a proposed technique. The technique for quantifying take shall be implemented immediately upon NMFS' concurrence. In the event that this measure is not implemented immediately and reflected in the annual report per term and condition 3.a. below, take authorization for CV steelhead shall cease on December 31, 2011. Incidental take, especially for CV steelhead, but for the other listed anadromous fish species as well, may be adjusted based on the application of the new technique to quantify incidental take at the Federal and State export facilities.	Reclamation shall select and fund p 783	
13.4 (3 a -c)	Terms and Conditions	3. Reclamation shall minimize the adverse effects of flow fluctuations associated with CVP-controlled stream operations on listed anadromous fish species spawning, egg incubation, and fry and juvenile rearing. a. Reclamation shall schedule maximum ramping down rates of non-Glory Hole (i.e., non-flood control) releases from Whiskeytown Reservoir according to the table, below (estimated at RM 3.03). Ramping rates for releases greater than 300 cfs shall be made after consultation with the Clear Creek Technical Team, considering: time of year, time of day, timing the change to occur with natural changes in flow and/or turbidity, size of fish present in the creek, species and protected status of vulnerable fish, the amount of water required, and relative costs or benefits of proposed flow. Reclamation shall time flow decreases so that the most juvenile Chinook salmon and steelhead experience the stage decrease during darkness. Maximum ramping rate of flow releases from Whiskeytown Dam into Clear Creek shall be accomplished based on the following targets within the precision of the outlet works or the City of Redding powerplant equipment. b. During periods outside of flood control operations and to the extent controllable during flood control operations, Reclamation shall ramp down releases in the American River below Nimbus Dam as follows: c. During periods outside of flood control operations and to the extent controllable during flood control operations, Reclamation shall ramp releases in the Stanislaus River below Goodwin Dam as follows:	Reclamation shall minimize / schedule / ramp p 783, 784	
14.0 (1)	Conservation Recommendations	Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS thinks the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation:  1. In proposing the SRWRP for a future section 7 consultation, Reclamation should first ensure that Shasta Reservoir storage and cold water pool requirements are met, as provided in RPA Action 1.2.2, and that all construction-related and operational impacts of the SRWRP, both upstream and in the Delta, are analyzed in consideration of the operations and effects on listed species and critical habitats of the CVP and SWP that were analyzed in this consultation.	Reclamation should first ensure p 786	
14.0 (3)	Conservation Recommendations	Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS thinks the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation:  3. Reclamation should continue to fund CALFED ERP restoration actions, consistent with previous commitment and funding levels, and to fulfill CALFED ROD commitments. DWR should support continued state funding to CDFG to further implementation of the CALFED ERP.	Reclamation should continue p 786	
14.0 (4)	Conservation Recommendations	Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS thinks the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation:  4. Reclamation should conduct studies to determine the economic feasibility and extent of biological benefits to listed species and critical habitats of completely removing the RBDD from the Sacramento River.	Reclamation should conduct p 786	

USFWS				
RPM 1: T&C 1	Reasonable and Prudent Measures: Minimize adverse effects of the operations of the Permanent Operable Gates	<p>** Per Victor: The referenced Permanent Operable gates were never constructed, so this does not apply to either USBR or DWR.</p> <p>Sorry, but I don't know the answer to your question nor do I know anyone that might know the answer. That is a decision that is linked to the Delta Tunnels project and any decision is likely years away, to be followed by many more years of litigation, planning, design, construction, etc ....</p> <p>If they are built, I think DWR would want any BiOp requirements associated with that facility to be a joint USBR/DWR responsibility.</p> <p>Per Derrick 6/16: After reviewing Victor's comments, I am inclined for now to keep this action listed with USBR as Lead and some sort of caveat that the structures in question were never constructed. **</p> <p>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</p> <p>1. Minimize adverse effects of the operations of the Permanent Operable Gates.</p> <p>T&amp;C 1: In order to be exempt from the prohibitions of section 9 of the Act, Reclamation shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary. The following Term and Condition implements Reasonable and Prudent Measures one</p> <p>(1): The Service shall have the final decision on the operations of the Permanent Gates. The members of the GORT can provide suggestions to operate the gates, but the ultimate decision on how to operate the gates to protect delta smelt will be made by the Service.</p>	*Reclamation shall ensure compliance with the following terms and conditions" p 294	
RPM 4: T&C 4	Reasonable and Prudent Measures: Minimize adverse effects of Banks and Jones on delta smelt	<p>The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the delta smelt:</p> <p>4. Minimize adverse effects of Banks and Jones on delta smelt.</p>		
Grand Total				

required, example include Barbara's work on Stan, Matt B work on Clear Creek

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