



NON-AGENDA

December 21, 2018

Board Policy: EL-7 Communication and Support to the Board

The BAOs shall inform and support the Board in its work.

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10 Memo from Nina Hawk, COO/WUE, to the Board, date 12/13/18, regarding the State Water Board decision and California Natural Resources Agency voluntary settlement agreement proposal and presentation.

90 Memo from Nina Hawk, COO/WUE, to the Board, dated 12/17/18, regarding the public scoping meeting for the Shasta Dam Raise.

97 Memo from Sue Tippetts, DOO/Watersheds O&M, to Melanie Richardson, COO/Watersheds, dated 12/18/18, regarding removal work on an invasive species of plant from Los Gatos Creek.

100 Memo from Michele King, Clerk, to the Board, dated 12/19/18, regarding additional handouts from the 12/17/18 Board Meeting.

110 Memo from Nina Hawk, COO/WUE, to the Board, dated 12/21/18, regarding an update on agreements related to the coordinated operations of the State Water Project, Central Valley Project, and California Water Fix.

INCOMING BOARD CORRESPONDENCE

154 **Board Correspondence Weekly Report:** 12/20/18

155 Email from Martha O'Connell to the Board, dated 12/16/18, regarding maintenance of trees on Valley Water property (C-18-0209).

159 Email from Kathy Blaha to Director Varela, dated 12/17/18, regarding Valley Water's agreement with SCC Parks Department (C-18-0210).

160 Email from John Kolski to the Board, dated 12/17/18, regarding well metering, and what the revenue is used for (C-18-0212).

161 Email from Maureen Damrel, Downtown Streets Team, to the Board, dated 12/18/18, regarding water quality and community connection (C-18-0213).

OUTGOING BOARD CORRESPONDENCE

-- None.

Board correspondence has been removed from the online posting of the Non-Agenda to protect personal contact information. Lengthy reports/attachments may also be removed due to file size limitations. Copies of board correspondence and/or reports/attachments are available by submitting a public records request to publicrecords@valleywater.org.

CEO BULLETIN/ NEWSLETTERS



To: Board of Directors
From: Norma J. Camacho, CEO

Chief Executive Officer Bulletin Week of December 14 –20, 2018

Board Executive Limitation Policy EL-7:

The Board Appointed Officers shall inform and support the Board in its work. Further, a BAO shall 1) inform the Board of relevant trends, anticipated adverse media coverage, or material external and internal changes, particularly changes in the assumptions upon which any Board policy has previously been established and 2) report in a timely manner an actual or anticipated noncompliance with any policy of the Board.

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Update to Feasibility Evaluation of Pumped-Storage Hydroelectric System at Anderson and Coyote Reservoirs

As reported in the CEO bulletin for the week of May 4, 2018, the district collaborated with Silicon Valley Clean Energy (SVCE), a local community choice aggregation agency, to explore the feasibility of a pumped-storage system between Anderson and Coyote Reservoirs. A qualified consultant retained by SVCE completed a high-level ‘fatal flaws’ feasibility study to determine if a potential pumped hydro storage project of any size or configuration could be justified financially.

The consultant conducting the study evaluated a pumped storage system utilizing the district's existing Anderson and Coyote reservoirs, near Morgan Hill, CA. The approach for this project is to utilize the existing storage capacity and head differential between the two (2) reservoirs to produce up to 15 MWs of power over an eight (8) hour period to respond to California's wholesale energy market. During off-peak periods when power costs are lower, water would be pumped from the lower Anderson Reservoir into Coyote Reservoir. Then, during times of peak demand, water from

Coyote Reservoir would be released through turbines to generate electricity, which would be distributed via a new distribution or sub-transmission circuit that would interconnect to the PG&E's transmission circuit located at the Coyote Pumping Plant substation.

The final report concluded that based on the high project costs relative to potential revenue, no further project development is recommended.

For further information, please contact Kurt Arends at (408) 630-2284.

Anderson Dam, FAHCE, and Coyote Creek Collaboration

On Thursday, December 6, 2018, and Friday, December 7, 2018, the Anderson Dam Seismic Retrofit Project (ADSRP), the Fish and Aquatic Habitat Collaborative Effort (FAHCE), Coyote Creek Flood Protection Project teams, and Office of District Counsel, engaged in a two (2) day workshop to develop a global methodology for future regulatory interactions. During the workshop, points of nexus, key takeaways, and next steps were reviewed for each initiative. Due to the concurrent project schedules and potential impact to future operations of Anderson Dam, it is essential that the objectives and regulatory approach for all three (3) initiatives be consistent and aligned. To further this end, the cross functional team has scheduled monthly follow up meetings and will participate in group meetings with regulatory agencies when appropriate.

For further information, please contact Christopher Hakes at (408) 630-3796.

State Water Board Adopts Flow Requirements for the Tuolumne and Other San Joaquin River Tributaries

On December 12, 2018, the State Water Board (Board) adopted amendments to the Bay Delta Water Quality Control Plan (Bay Delta Plan) for Phase 1, which includes unimpaired flow requirements for the San Joaquin River and its tributaries, including the Tuolumne River. In addition, the Board directed their staff to assist the California Natural Resources Agency in completing a Delta watershed-wide voluntary settlement agreement by March 1, 2019. The Board's goal is to include that voluntary agreement as an alternative for a future comprehensive Bay Delta Plan update that the Board would consider soon after December 1, 2019.

The Board had twice delayed their decision to adopt the plan amendments, most recently on November 7, 2018, after Governor Brown and Lieutenant Governor Newsom submitted a joint letter requesting a month to finalize a voluntary agreement. At the December 12, 2018, Board meeting, the California Department of Fish and Wildlife Director Chuck Bonham and California Department of Water Resources Director Karla Nemeth presented the framework for the proposed voluntary settlement agreement for the Delta, Sacramento River, Feather River, Yuba River, American River, Mokelumne River, San Joaquin River, and the Tuolumne River. Missing from the agreement were the Stanislaus and Merced Rivers, which are part of the Phase 1 amendments. The Board was encouraged by the broad-ranging proposed voluntary settlement, which includes flow and non-flow measures, science, adaptive management, and funding, but the Board also declined any endorsement pending further review.

The meeting included several hours of public testimony from water agencies, Delta interests, and environmental groups. None of the environmental stakeholders favored the Board delaying adoption of the Phase 1 flow requirements. Several amendments were proposed by Board

Member D'Adamo, but all were voted down. Ultimately, the Board voted 4 to 1 (with D'Adamo voting no) to adopt the Phase 1 flow requirements.

The Board will proceed with development of Phase 2 of the Bay Delta Water Quality Control Plan for the Sacramento River and its tributaries, concurrently with the development of voluntary settlement agreement language. The Phase 1 amendments adopted will go through further administrative process to the California Office of Administrative Law and the United States Environmental Protection Agency for approval before the Board may commence with the implementation process.

For further information, please contact Rachael Gibson at (408) 630-2884.

San Jose Sports Authority 2021 Ironman 70.3 World Championship

The district was contacted by the San Jose Sports Authority (Authority) to explore the possibility of submitting a proposal to host the 2021 Ironman 70.3 World Championship. The San Jose Sports Authority is a non-profit organization whose mission is to increase the City of San Jose's economic development, visibility, and civic pride through sports.

The Ironman 70.3 World Championship is a two (2) day international event with 2,000 women competing on Saturday and 3,000 men on Sunday in an Ironman format competition. In order to be considered as a host city, the venue must accommodate a 1.2-mile swimming event. The Authority contacted the district to explore using one of the district reservoirs for this event and identified Vasona Park and reservoir as the ideal location to host the festival style event and the swimming competition. The County of Santa Clara would issue the recreational permits needed to use the facility, however, permits can only be issued up to a year in advance.

Before submitting a proposal, the Authority has asked the district to identify any potential roadblocks or challenges regarding the use of the reservoir. The due date to submit the proposal is December 31, 2018.

For further information, please contact Kurt Arends at (408) 630-2284.

Business Support & Warehouse Unit implements customer service and efficiency change

Effective December 10, 2018, small equipment such as chain saws being checked out by staff for district work, are being serviced by District Warehouse staff from the Warehouse Counter located at the Winfield Warehouse, instead of a separate counter previously manned by 1.5 FTEs under an outsourced contract.

Bringing services back in-house enhanced customer service and provided cost-savings of over \$100,000 a year. The warehouse team issues and assist with returning the Class 4 related equipment. The District's Class 4 Mechanic will concentrate on repairs, maintenance, and inventory of Class 4 equipment. A number of other efficiencies, process improvements and customer service enhancements from the unit are underway and will be communicated in the next few months.

For further information, please contact Tina Yoke at (408) 630-2385.

Field Safety Concerns

On October 23, 2018, the CEO and the Chiefs hosted a forum for field staff to share their safety and health concerns while working throughout district watersheds. Staff expressed that they have witnessed an increase in criminal activities and environmental hazards associated with homeless encampments. Additionally, staff stated concerns about being personally confronted, and having weapons brandished at them by angry, irate and aggressive persons. To assist staff, and to help address these concerns, numerous safeguards have been deployed such as the availability of AlertGPS devices for staff. In emergency situations, employees in distress can quickly and easily notify and communicate with response personnel and a monitoring center with the touch of a button on their AlertGPS device. The solution allows employers to quickly isolate the precise location of employees with reliable, round-the-clock location tracking and integrated 2-way communication.

Additionally, dual band radios are available for staff to carry and the district has an agreement with County Communications and County Park Services to use their radio frequencies to quickly communicate requests for emergency services from remote areas if needed. Security currently sends out security bulletins to field staff when incidents occur in the field to ensure staff know where the incident occurred, and what the incident was, to raise staff awareness of potential trouble areas.

Staff also have received numerous training sessions on field safety protocols associated with blood borne pathogens, prophylactic vaccinations, needle handling protocols, vicious animal training including being issued animal repellent spray, wilderness first-aid training and issued each crew truck a wilderness first-aid kit, and workplace violence for field personnel training. For larger projects, police officers are contracted to clear high-risk areas prior to staff entering the work zones.

As a result of the Chief's safety forum, going forward, district security is training staff on the use of the CalCOP Watch Board which is a GIS tool available for documenting trouble spots throughout the valley that staff can access and review prior to deployment to the field. Additional training for staff is currently scheduled that will teach staff confrontation management to avoid confrontation when possible and practice strategies and skills to respond when necessary. Other future training includes field safety and security training to identify the security hazards of working in the field and to review simple strategies for addressing these issues.

Currently, staff is researching and discussing with Legal Counsel and Risk Management the possibility of staff carrying pepper spray for self-defense purposes. Once the research is complete, and comments received from Legal Counsel and Risk Management, staff will present a policy decision on this subject to the CEO for consideration. Additionally, Workforce Development is looking into the possibility of providing staff with self-defense classes.

A presentation of the above information was presented to the Management Leadership Team on December 6, 2018, and Security and Environmental, Health & Safety continue to look for ways to address staff concerns associated with the potential field safety issues.

For further information, please contact Tina Yoke at (408) 630-2385.

Adobe Pedestrian Bridge Joint Use Agreement Celebration and Signing Ceremony

On Thursday, December 13, 2018, the district board approved maintenance and joint-use agreements to collaborate with the City of Palo Alto, Google, and Caltrans to support the

construction of a pedestrian/bike bridge that will span over Highway 101 from south Palo Alto to the Baylands. The bridge will provide a link for bike riders and pedestrians to access businesses and recreation trails on both sides of the highway.

The Benjamin Lefkowitz Underpass is the path that currently connects the two (2) sides, but is closed for several months each year due to Adobe Creek's seasonal flooding of the underpass area. Once the new bridge is built, it will provide year-round access. The district's connection to the project is that the bridge section extending to E. Meadow Drive along Adobe Creek is on district property.

On December 17, 2018, Director Kremen attended the Joint Use Agreement Signing Ceremony and Celebration on behalf of the district. During the celebration, Director Kremen highlighted the value this project has for creating safe routes for the community and the importance of supporting no-emissions commuting options. Director Kremen was joined by State Senator Jerry Hill, State Assemblyman Marc Berman, Palo Alto Mayor Liz Kniss, Google COO for Real Estate & Development Mark Golan, and others who have championed the project. The celebration was well attended by both the public and media.

For further information, please contact Rachael Gibson at (408) 630-2884.

BOARD MEMBER REQUESTS & INFORMATIONAL ITEMS

Report Name: Board Member Requests

Request	Request Date	Director	BAO/Chief	Staff	Description	20 Days Due Date	Expected Completion Date	Disposition
I-18-0015	10/02/18	Santos	Camacho	Noriega	Staff is to provide Director Santos with information on why the District does not offer preference for Veteran applicants seeking employment/promotion, and provide research from comparable agencies.	11/05/18	12/28/2018	10/25/18 CEO Bulletin: The district is working to respond to the IBMR by conducting internal stakeholder conversations, investigating industry best practices and researching comparable agency policies. To account for varied response times from comparable agencies and in-depth research, the district is requesting a two (2) month extension to December 28, 2018, to fully respond to the request.
R-18-0017	11/20/18	Varela	Hawk	Hall	Staff is to schedule an update on CA WaterFix for second meeting in January 2019.	12/16/18		



MEMORANDUM

FC 14 (01-02-07)

TO: Board of Directors

FROM: Nina Hawk

SUBJECT: State Water Board Decision and California Natural Resources Agency Voluntary Settlement Agreement Proposal and Presentation

DATE: December 13, 2018

On December 12, 2018 the State Water Board adopted their staff's proposed Phase 1 amendments to the Water Quality Control Plan for the Bay-Delta region which set flow and water quality objectives for the San Joaquin River and its major salmon bearing tributaries, including the Tuolumne, Stanislaus, and Merced Rivers. The Board also directed their staff to assist the State in completing a voluntary agreement that could be adopted as an alternative to the Water Board's staff proposal.

Prior to the Water Board decision, Chuck Bonham, Director of the California Department of Fish and Wildlife, and Karla Nemeth, Director of the California Department of Water Resources, presented the current status of the State's voluntary agreements. Their presentation covered the agreement framework as well as proposed term sheets for the Delta and the Sacramento, Feather, Yuba, American, Mokelumne, Tuolumne, and San Joaquin Rivers. Their presentation and the framework with proposed term sheets for each tributary is provided as Attachment 2. A summary of the framework and tributary term sheets is provided as Attachment 3. Additional information on the settlements can be found at the following website:

<http://resources.ca.gov/voluntary-agreements/>

The newly adopted Phase 1 amendments proposed by the Water Board staff require that 40% of unimpaired flow is maintained in the Tuolumne River, the Merced River, and the Stanislaus River, and would significantly reduce the supply of water to the San Francisco Public Utilities Commission (SFPUC) and Santa Clara County. The State Water Board included in their decision a path for the State's voluntary agreements to be an alternative to the requirements imposed on the Tuolumne River, which affects SFPUC; however, adoption of voluntary agreement as a Bay Delta Plan update would require additional review, analysis, and public process. The State Water Board has set a goal for voluntary agreements to be presented to it after December 1, 2019.

The resolution with Board amendments related to the voluntary settlement agreements is provided as Attachment 1.

Nina Hawk
Chief Operating Officer
Water Utility Enterprise

- Attachment 1: Water Board Resolution with Amendment
- Attachment 2: Presentation and Framework Proposal for Voluntary Agreements
- Attachment 3: Summary of Voluntary Settlement Agreement Framework and Term Sheets
- Attachment 4: Statement from Chair Santos
- Attachment 5: Statement by Bureau of Reclamation Commissioner Brenda Burman

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STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2018-

ADOPTION OF AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY AND FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT

WHEREAS:

1. The State Water Resources Control Board (State Water Board) and the nine regional water quality control boards administer the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) (Porter-Cologne Act) to achieve an effective water quality control program for the state and are responsible for the regulation of activities and factors that may affect the quality of the waters of the state. (Wat. Code, §§ 13000, 13001.)
2. The State Water Board is authorized to adopt a water quality control plan in accordance with the provisions of Water Code sections 13240 through 13244, insofar as they are applicable. (Wat. Code, § 13170.)
3. The State Water Board has undertaken a proceeding under its water quality authority to amend the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), adopted in 1978 and amended in 1991, 1995, and in 2006. The Bay-Delta Plan establishes water quality objectives for the protection of beneficial uses in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) and a program of implementation to achieve the objectives. Diversions of water within and upstream of the Bay-Delta are a driver of water quality in the Bay-Delta. As a result, much of the implementation for the Bay-Delta Plan relies upon the combined water rights and water quality authorities of the State Water Board.
4. The 2006 Bay-Delta Plan identified emerging issues requiring additional action by the State Water Board, including San Joaquin River flows and Delta salinity. In the 2008 Strategic Workplan for Activities in the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary, the State Water Board committed to undertake a review of the southern Delta salinity and San Joaquin River flow objectives and their implementation. The State Water Board further reiterated its commitment in the 2009 Staff Report on the Periodic Review of the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary.
5. Native fish species that migrate through and inhabit the Delta have experienced dramatic population declines in recent years, bringing some species to the brink of extinction. Approximately 70,000 fall-run Chinook salmon adults returned to the San Joaquin Basin in 1985. The number of returning adults dropped to approximately 40,000 in 2000 and dropped again to 8,000 returning adults in 2013. Returning fall-run adults were estimated to be approximately 10,000 in 2017. This is an 85 percent net loss in returning adult fall-run Chinook salmon from 1985 to 2017. While multiple factors are responsible for the decline, the magnitude of diversions out of the Sacramento, San Joaquin, and other rivers feeding into the Bay-Delta is a major factor in the ecosystem decline. The State Water Board has authority over both water quality and water diversion and use.

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6. The State Water Board adopted the southern Delta salinity objectives for agriculture in the 1978 Delta Plan. The objectives are based on conditions, crops, and irrigation practices in the southern Delta at the time the objectives were adopted. Recent analysis of southern Delta water quality and crop salinity requirements shows that the existing salinity conditions in the southern Delta are suitable for all crops and that the existing April through August salinity objective is lower than what is needed to reasonably protect agricultural beneficial uses.
7. The State Water Board commenced the process to amend the Bay-Delta Plan to reasonably protect fish and wildlife beneficial uses in the Lower San Joaquin River (LSJR) and its three eastside salmon-bearing tributaries, the Stanislaus, Tuolumne, and Merced Rivers, and agricultural beneficial uses in the southern Delta in 2009 as follows:
 - a. On February 13, 2009, the State Water Board issued a Notice of Preparation (NOP) and of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Bay Delta Plan: Southern Delta Salinity and San Joaquin River Flows. The public had an opportunity to submit written comments and to participate in the scoping meeting held on March 30, 2009. On April 1, 2011, the State Water Board issued a revised NOP and notice of additional scoping meeting, which provided for a written comment period and a scoping meeting on June 6, 2011. The notice included potential draft language for the southern Delta salinity objectives, San Joaquin River flow objectives, and the program of implementation.
 - b. On April 22, 2009, the State Water Board staff held a public staff workshop to receive information and conduct detailed discussions regarding potential amendments or revisions to the southern Delta salinity and San Joaquin River flow objectives included in the Bay-Delta Plan and their implementation. It held other workshops including two workshops to receive and respond to public comments on a draft study report on the salt tolerance of crops in the southern Delta on August 13, 2009, and November 4, 2009, and a workshop on a draft technical report on the scientific basis for alternative San Joaquin River flow and southern Delta salinity objectives on January 6 and 7, 2011.
 - c. On December 31, 2012, the State Water Board released for public review and comment a draft substitute environmental document (2012 Draft SED) in support of proposed changes to the Bay-Delta Plan to adopt new and revised narrative and numeric flow water quality objectives for the LSJR, including the Stanislaus, Tuolumne, and Merced Rivers, a revised salinity water quality objective in the southern Delta, and a program of implementation to achieve the objectives (2012 Draft Amendments). On March 20 and 21, 2013, it held a public hearing on the 2012 Draft SED and 2012 Draft Amendments. The deadline for written comments was March 29, 2013, and the State Water Board received numerous comments.
 - d. On September 15, 2016, the State Water Board recirculated for public review and comment a revised draft substitute environmental document (Recirculated SED) in support of revisions to the 2012 Draft Amendments (2016 Draft Amendments). The Recirculated SED and 2016 Draft Amendments made substantial changes to the 2012 Draft SED and 2012 Draft Amendments in consideration of the large number of public comments received concerning those drafts, in light of additional information, including information learned from the recent drought, and in response to the state's adoption in 2014 of a state policy for sustainable groundwater management (Wat.

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Code, § 113) and passage of the Sustainable Groundwater Management Act (Wat. Code, §§ 10720 et seq.), which provide a roadmap and directive for sustainable local groundwater management.

- e. The State Water Board held a five-day public hearing, commencing in November 2016 and concluding in January 2017, on the Recirculated SED and 2016 Draft Amendments. State Water Board staff also held numerous workshops and outreach meetings. The State Water Board provided a six-month written comment period that closed on March 17, 2017. The State Water Board received thousands of comments.
 - f. On July 6, 2018, the State Water Board released the proposed final SED (Final SED), which includes proposed final amendments to the Bay-Delta Plan (Plan Amendments) and written responses to comments on the Recirculated SED and the 2016 Draft Amendments. It also provided notice of a public meeting to consider the adoption of the proposed Plan Amendments and Final SED, and solicited comments on the changes to the regulatory language in the proposed Plan Amendments. The Final SED, including the Plan Amendments, includes modifications that clarify, amplify, or refine information, primarily in response to comments. These modifications do not result in new significant environmental effects or a substantial increase in the severity of effects disclosed in the Recirculated SED.
8. The Plan Amendments' new and revised flow water quality objectives for the LSJR and a revised southern Delta salinity water quality objective are based on sound scientific rationale and contain sufficient parameters to protect fish and wildlife and agricultural beneficial uses.
 9. Pursuant to Health and Safety Code section 57004, the scientific basis of the Plan Amendments underwent external scientific peer review through an interagency agreement with the University of California. Peer review was solicited on August 12, 2011, and completed on November 21, 2011.
 10. In establishing and revising the flow water quality objectives for the LSJR and the salinity water quality objective for the southern Delta, the State Water Board has duly considered the factors set forth in Water Code section 13241. These factors include: (1) past, present, and probable future beneficial uses of water; (2) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (3) water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area; (4) economic considerations; (5) the need for developing housing within the region; and (6) the need to develop and use recycled water. The information supporting the State Water Board's consideration of these factors is in the Final SED, including the comments and responses to comments contained therein.
 11. The Plan Amendments include a program of implementation for achieving the LSJR flow water quality objectives and the salinity water quality objective for the southern Delta in accordance with Water Code section 13242. To help ensure transparency and accountability in evaluating compliance with the water quality objectives, to inform ongoing implementation, and to foster and accommodate the development of scientific information, the Plan Amendments require monitoring and reporting on annual and longer-term bases.

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12. The water quality control planning program is a regulatory program that has been certified by the State's Secretary for Resources as exempt from the requirements of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) to prepare an environmental impact report (EIR) or negative declaration. (Cal. Code of Regs., tit. 14, § 15251, subd. (g); Cal. Code of Regs., tit. 23, § 3775.) The Final SED is in lieu of an EIR and has been completed in compliance with the requirements applicable to the State Water Board's certified exempt regulatory programs. The State Water Board has evaluated the potential environmental effects of reasonably foreseeable methods of compliance with the Plan Amendments in accordance with Public Resources Code section 21159 and California Code of Regulations, title 14, section 15187.
13. The Final SED comprises Volumes I to III (which includes responses to comments) and this resolution and its attachments. (Cal. Code Regs., tit. 23, § 3779.5, subd. (b).) The Final SED includes sufficient environmental and technical analysis to satisfy the requirements of CEQA and other applicable laws.
14. In accordance with California Code of Regulations, title 23, section 3779.5, subdivision (c), and California Code of Regulations, title 14, section 15091, subdivision (a), Attachment 1 sets forth the CEQA Findings and Statement of Overriding Considerations Prepared for Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and is incorporated herein. It includes findings for each significant environmental effect that may occur from implementation of the Plan Amendments and describes measures to reduce significant effects. The State Water Board recognizes that despite mitigation measures described in the Final SED and in Attachment 1, implementation of the Plan Amendments would have significant and unavoidable effects on the environment. As explained in the statement of overriding considerations in Attachment 1, the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of the Plan Amendments outweigh the unavoidable significant environmental effects of the Plan Amendments. Attachment 2 is the Mitigation and Monitoring Program that sets forth and ensures implementation of mitigation measures within the State Water Board's authority and is incorporated herein.
15. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. (Wat. Code, § 106.3 and State Water Board Resolution No. 2016-0010.) The State Water Board has considered this policy and the Plan Amendments include a statement that the State Water Board "will take actions as necessary to ensure that the implementation of the flow objectives does not impact supplies of water for minimum health and safety needs, particularly during drought periods." The State Water Board will continue to consider this policy through the technical and financial assistance programs it administers for at-risk communities, including disadvantaged communities within the area covered by the Plan Amendments.
16. Adoption of the Plan Amendments is consistent with the state Antidegradation Policy (State Water Board Resolution 68-16) and the federal Antidegradation Policy (40 C.F.R. § 131.12).

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17. The Bay-Delta Plan, as amended by the Plan Amendments, supplements the other water quality control plans that cover the Bay-Delta Estuary watershed. Together they include all necessary elements of water quality control plans in accordance with the Porter-Cologne Act and federal requirements. The Bay-Delta Plan supersedes any regional water quality control plans for the same waters to the extent of any conflict. (Wat. Code, § 13170.)
18. The Bay-Delta Plan will be reviewed every three years in compliance with Water Code section 13240 and federal Clean Water Act section 303(c) (33 U.S.C. § 1313(c)).
19. The State Water Board has complied with all notice and hearing requirements and carefully considered all timely oral and written comments, responses to comments, the Final SED, and all of the evidence in the administrative record. The Final SED reflects the independent judgment and analysis of the State Water Board.
20. The Plan Amendments will be submitted to the Office of Administrative Law (OAL) and become effective upon OAL approval. The water quality standards, as defined under the federal Clean Water Act, in the plan also will be submitted to the U. S. Environmental Protection Agency (U.S. EPA) in accordance with the federal Clean Water Act (33 U.S.C. § 1251 et seq.). Other portions of the Bay-Delta Plan, such as the program of implementation, are to be submitted to U.S. EPA as part of the continuing planning process, but do not require approval.
21. The State Water Board is aware of ongoing negotiations between interested stakeholders and various other state agencies to achieve voluntary agreements to implement the Plan Amendments. In particular, robust voluntary agreements can help inform and expedite implementation of the LSJR flow objectives and provide durable solutions in the Bay-Delta watershed while also providing reasonable protections for fish and wildlife.
 - a. The State Water Board encourages stakeholders to continue to work together to reach voluntary agreements that incorporate a mix of flow and non-flow measures that meet or exceed the new and revised water quality objectives and protect fish and wildlife beneficial uses, and to present those voluntary agreements to the State Water Board for its review as soon as feasible.
 - b. The State Water Board will consider voluntary agreements as part of its proceedings to implement the Plan amendments, consistent with its obligations under applicable law. In evaluating any proposal, the State Water Board will consider whether the agreement will help achieve the water quality objectives, help protect the beneficial use, and be enforceable through Board action.
 - c. If a voluntary agreement is reached after the adoption of the Plan Amendments, the State Water Board will consider the voluntary agreement and determine what, if any, actions are necessary to consider the agreement as a means of implementing the Bay-Delta Plan objectives, including a public process.

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THEREFORE BE IT RESOLVED THAT:

1. The State Water Board hereby approves and adopts the [Final SED](#), including the Findings and Statement of Overriding Considerations ([Attachment 1](#)), and the Mitigation and Monitoring Program ([Attachment 2](#)) and the mitigation measures set forth therein.
2. The State Water Board hereby adopts the Plan Amendments, which are set forth in [Appendix K](#) to the Final SED.
3. The State Water Board authorizes the Executive Director or designee to submit the Plan Amendments and the administrative record to OAL for review and approval.
4. The State Water Board authorizes the Executive Director or designee to make minor, non-substantive modifications to the language of the Plan Amendments or the supporting documentation, if the State Water Board, State Water Board staff, or OAL determines that such changes are needed for clarity or consistency, and to inform the State Water Board of any such changes.
5. The State Water Board directs staff, upon approval by OAL, to file a Notice of Decision with the Secretary for Natural Resources and transmit payment of the applicable fee as may be required to the Department of Fish and Wildlife pursuant to Fish and Game Code section 711.4.
6. The State Water Board directs the Executive Director or designee to submit the Plan Amendments to the U.S. EPA for approval in accordance with requirements of the federal Clean Water Act (33 U.S.C. § 1251 et seq.).

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on August 21, 2018.

Jeanine Townsend
Clerk to the Board

MOTION TO AMEND THE RESOLUTION
ADOPTING THE AMENDMENTS TO THE BAY-DELTA PLAN AND FINAL SED

REVISE WHEREAS ¶ 21 AS FOLLOWS:

21. The State Water Board is aware of ongoing negotiations between interested stakeholders and various other state agencies to achieve voluntary agreements to implement the Plan Amendments. In particular, robust voluntary agreements can help inform and expedite implementation of the LSJR flow objectives and provide durable solutions in the Bay-Delta watershed while also providing reasonable protections for fish and wildlife.
- a. The State Water Board encourages stakeholders to continue to work together to reach voluntary agreements that incorporate a mix of flow and non-flow measures that meet or exceed the new and revised water quality objectives and protect fish and wildlife beneficial uses, and to present those voluntary agreements to the State Water Board for its review as soon as feasible.
 - b. At the December 12 meeting, the California Department of Water Resources and California Department of Fish and Wildlife presented updated information on voluntary agreements and the contours of a potential Delta watershed-wide agreement. The Delta watershed-wide voluntary agreement is a discrete project encompassing a larger area than the LSJR flow objectives and within the LSJR project area only includes the Tuolumne River. Additional work is necessary to develop an enforceable agreement, join additional parties, analyze the agreement and how it interacts with the Bay-Delta Plan, and assess what, if any, changes may be necessary to the Bay-Delta Plan for the agreement to serve as an implementation mechanism to reasonably protect beneficial uses in the Tuolumne River and applicable portions of the Bay-Delta watershed, while providing a suitable regulatory backstop. Final incorporation of a voluntary agreement that requires changes to the Bay-Delta Plan, as contemplated by Resolved ¶ below would require additional public process, including compliance with procedures under the Porter-Cologne Water Quality Control Act and environmental review under CEQA.
 - c. Regardless of whether the current negotiations ultimately result in an agreement, the State Water Board will consider voluntary agreements as part of its proceedings to implement the Plan Amendments, consistent with its obligations under applicable law. In evaluating any proposal, the State Water Board will consider whether the agreement will help achieve the water quality objectives, help protect the beneficial use, and be enforceable through Board action.
 - d. If a voluntary agreement is reached after the adoption of the Plan Amendments, the State Water Board will consider the voluntary agreement and determine what, if any, actions are necessary to consider the agreement as a means of implementing the Bay-Delta Plan objectives, including a public process.

MOTION TO AMEND THE RESOLUTION
ADOPTING THE AMENDMENTS TO THE BAY-DELTA PLAN AND FINAL SED

INSERT NEW RESOLVED §§ 7 AND 8 AS FOLLOWS:

7. The State Water Board directs staff to provide appropriate technical and regulatory information to assist the California Natural Resources Agency in completing a Delta watershed-wide agreement, including potential flow and non-flow measures for the Tuolumne River, and associated analyses no later than March 1, 2019. State Water Board staff shall incorporate the Delta watershed-wide agreement, including potential amendments to implement agreements related to the Tuolumne River, as an alternative for a future, comprehensive Bay-Delta Plan update that addresses the reasonable protection of beneficial uses across the Delta watershed, with the goal that comprehensive amendments to the Bay-Delta Plan across the Delta watershed may be presented to the State Water Board for consideration as early as possible after December 1, 2019.

8. The Plan Amendments adopted by this resolution are not self-implementing. Subsequent regulatory actions are required to implement the objectives and make them enforceable. The December 1, 2019 date of Resolved § 7 provides a path for acceptance and approval of a voluntary agreement before regulatory actions to amend the water rights of water users on the Tuolumne River would occur and with sufficient time to complete any additional planning actions well in advance of the date that the LSJR flow objectives will be fully implemented.

Water Quality Control Plan for the San Francisco Bay/Sacramento- San Joaquin Delta Estuary Voluntary Settlement Agreement



Karla Nemeth, Director
California Department of Water Resources



Chuck Bonham, Director
California Department of Fish and Wildlife

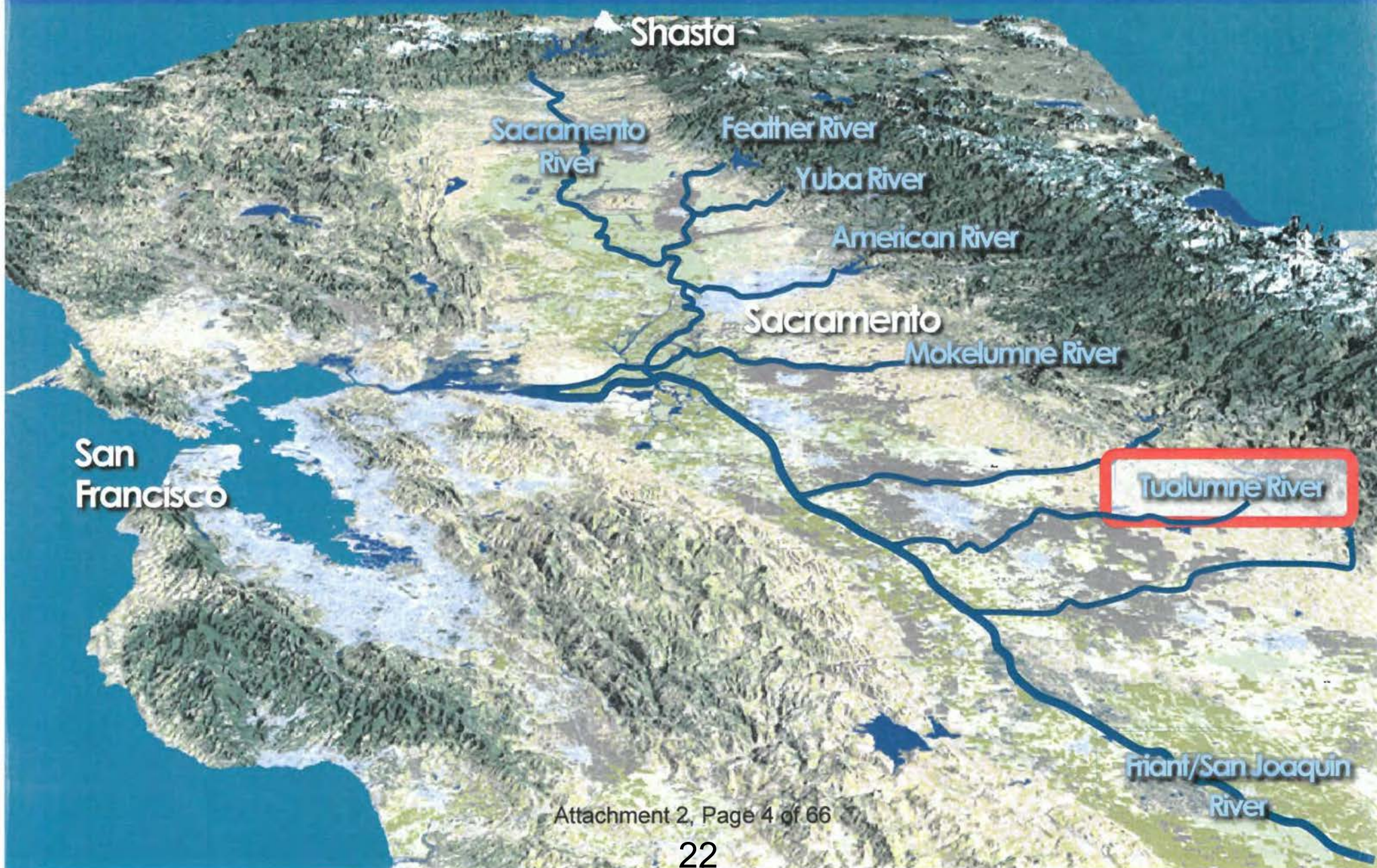
Overview

- Voluntary Settlement Agreements are a comprehensive plan to improve water quality and habitat conditions.
- Improvements can happen immediately
- Collaboration over conflict
- Integration of flow and non-flow
- Systemwide governance and scientific commitments
- All backed by significant and reliable funding mechanisms

San Francisco Bay/Sacramento-San Joaquin Delta Estuary



San Francisco Bay/Sacramento-San Joaquin Delta Estuary

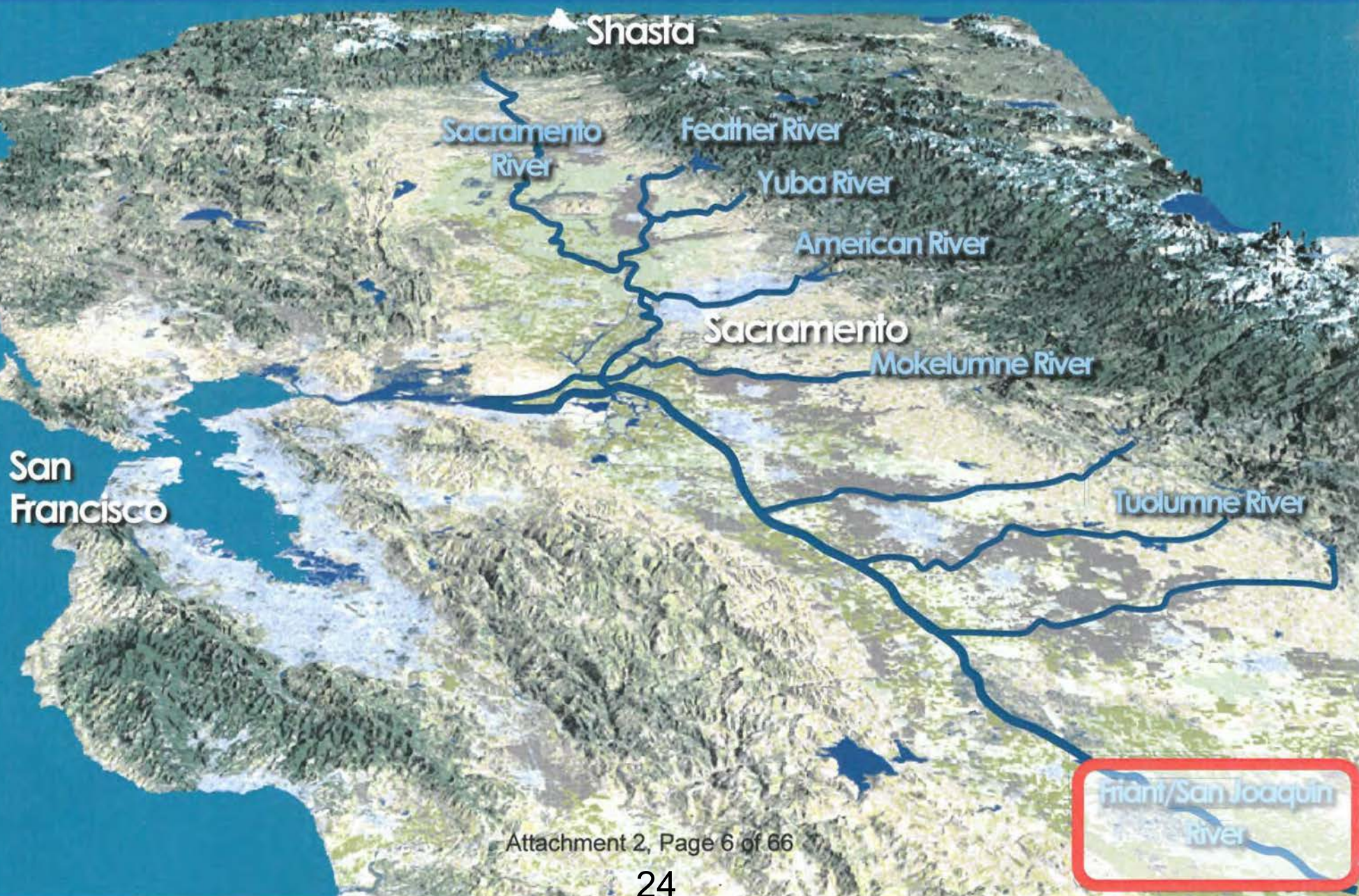


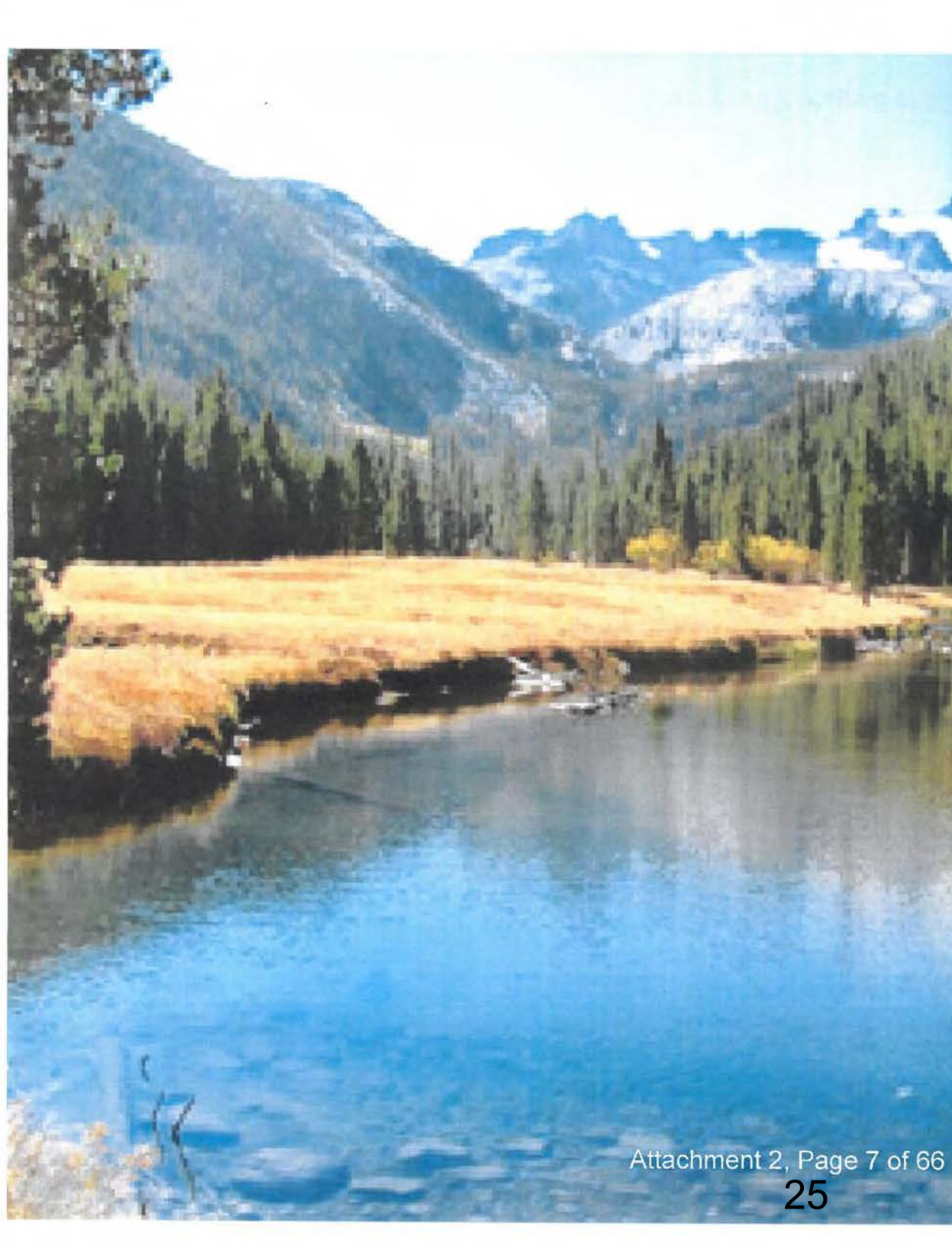


Tuolumne

- Habitat
- Flow
- Funding

San Francisco Bay/Sacramento-San Joaquin Delta Estuary





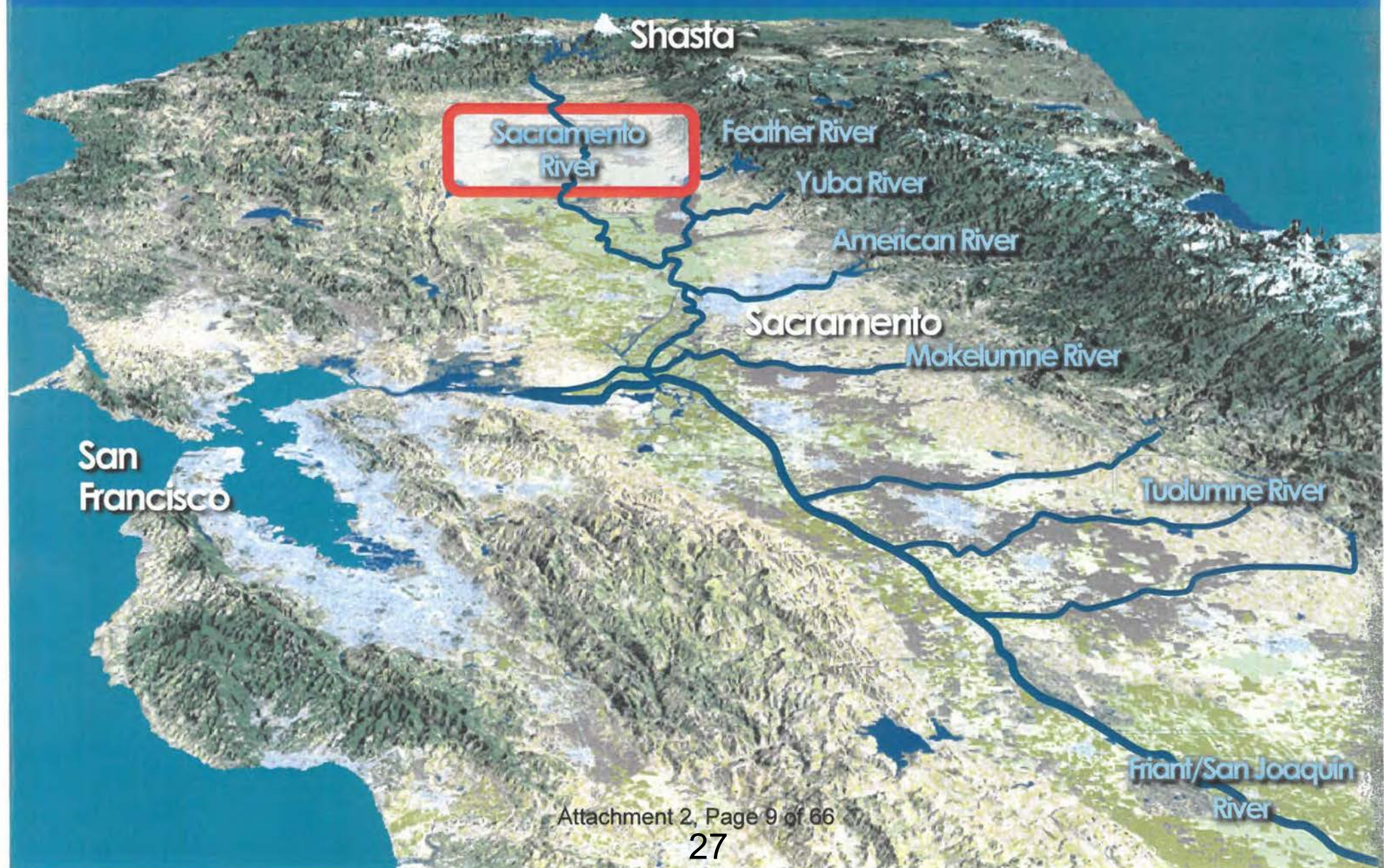
Friant/San Joaquin

- Flow
- Partnership

Key Policy Concepts

- Broad and Sustainable Partnership
- Flexibility and coordination among watersheds
- Sustainable Funding
- Science-based decision making
- Connection of actions in tributaries with actions in the estuary

San Francisco Bay/Sacramento-San Joaquin Delta Estuary

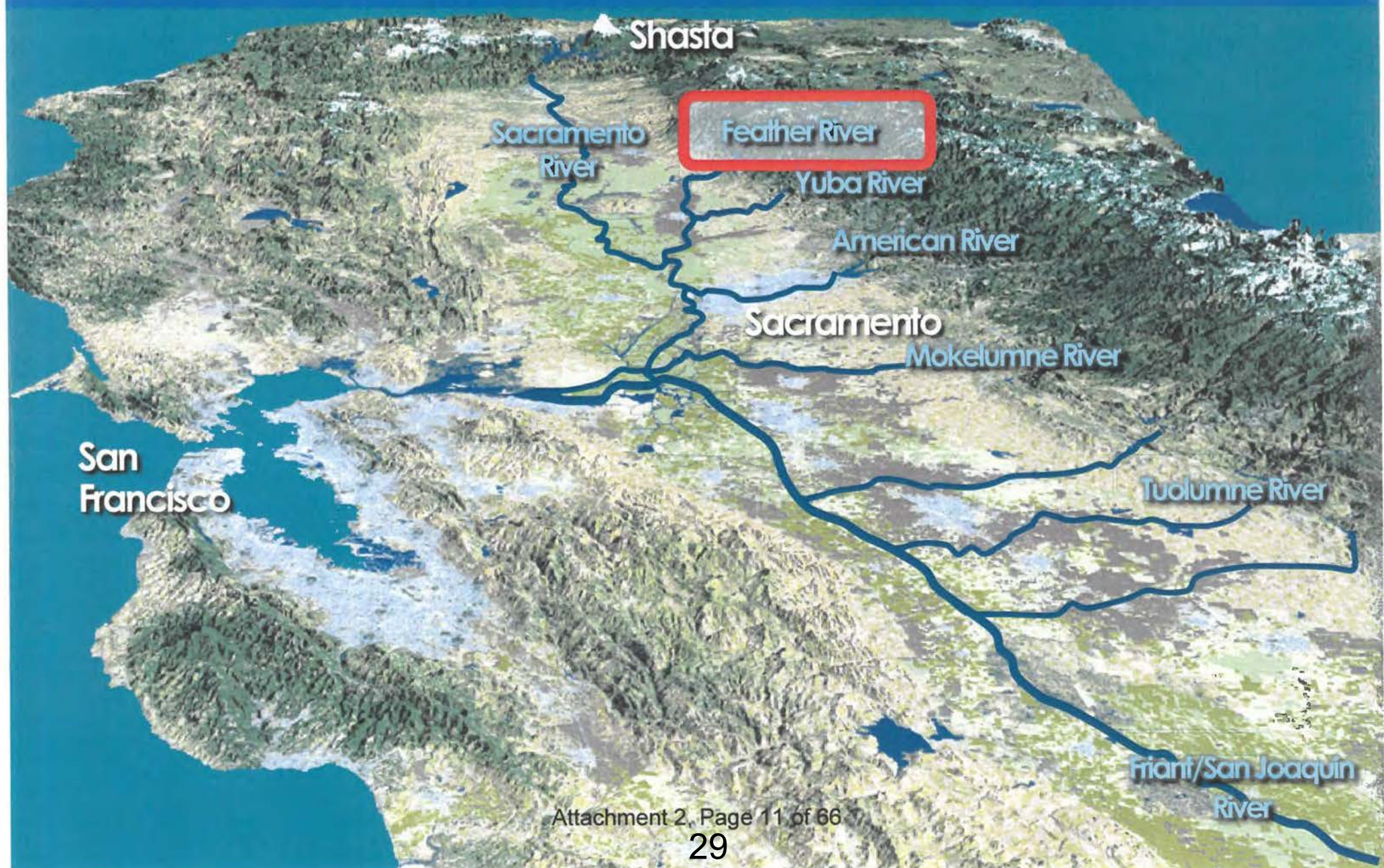




Sacramento

- Flow
- Temperature
- Funding

San Francisco Bay/Sacramento-San Joaquin Delta Estuary





Feather

- Habitat
- Flow
- Temperature
- Funding

San Francisco Bay/Sacramento-San Joaquin Delta Estuary





Yuba

- Habitat
- Flow
- Temperature
- Funding

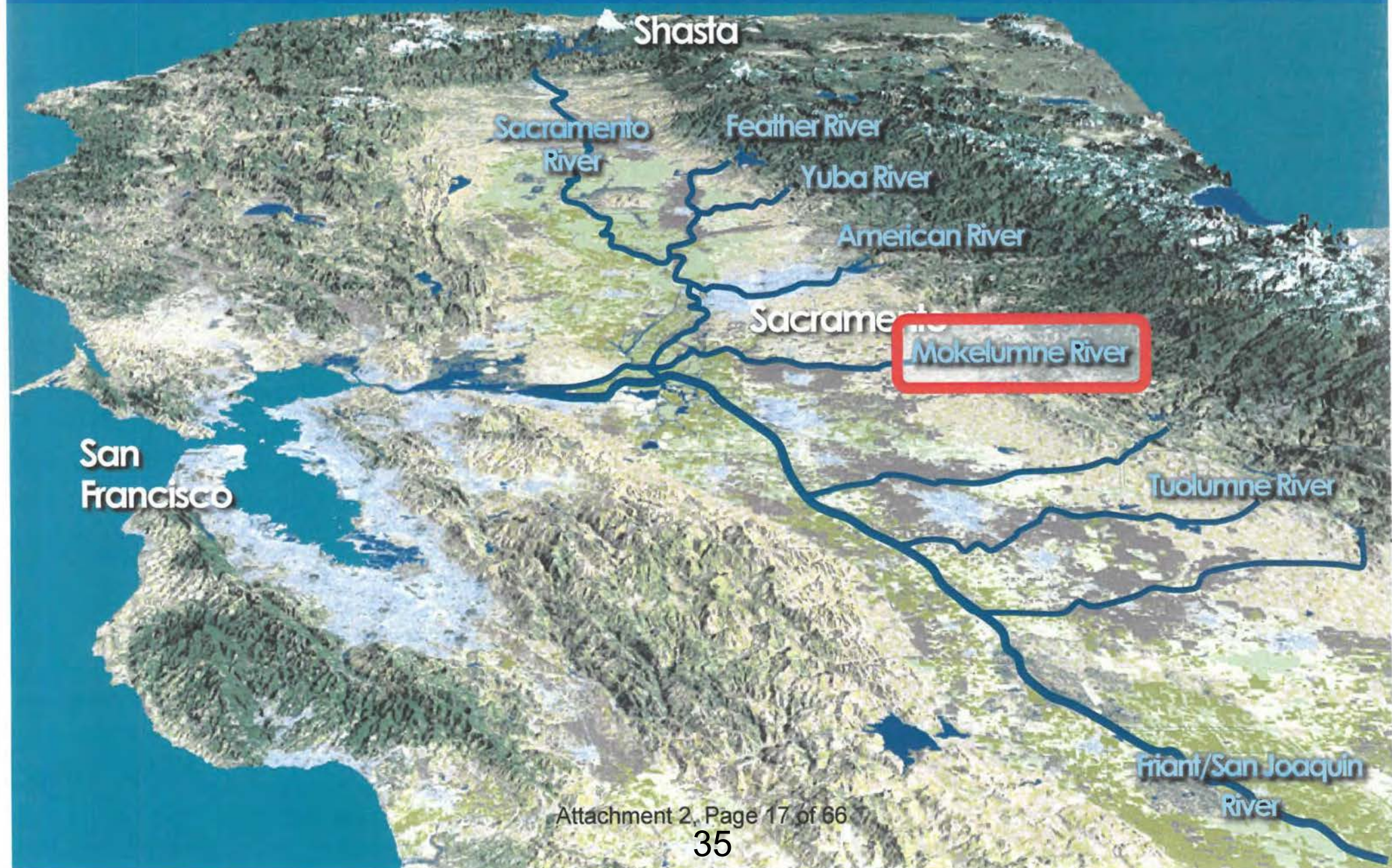
San Francisco Bay/Sacramento-San Joaquin Delta Estuary



American

- Habitat
- Flow
- Temperature
- Funding

San Francisco Bay/Sacramento-San Joaquin Delta Estuary





Mokelumne

- Habitat
- Flow
- Temperature
- Funding

Delta

- Habitat
- Flow
- Testable Hypotheses
- Funding

Settlement Parties

- CNRA
- CDFW
- DWR
- Bureau of Reclamation
- City and County of San Francisco
- San Francisco Public Utility Commission
- Modesto Irrigation District
- Turlock Irrigation District
- Friant Water Users Authority
- Sacramento River Settlement Contractors
- Tehama Colusa Canal Authority
- Yuba Water Agency
- American River Agencies
- Feather River Agencies

FRAMEWORK PROPOSAL FOR VOLUNTARY AGREEMENTS TO UPDATE AND IMPLEMENT THE BAY-DELTA WATER QUALITY CONTROL PLAN

California Department of Fish and Wildlife ("CDFW"), California Department of Water Resources ("CDWR"), and other parties (collectively "Parties") submit this Agreement Framework for analysis, adoption and implementation of voluntary agreements to support amendments to the Bay-Delta Water Quality Control Plan ("Bay-Delta Plan") for protection of fish and wildlife beneficial uses.

SUMMARY

1. The fundamental principle of this Agreement Framework is that protection of fish and wildlife beneficial uses in the Sacramento River and San Joaquin River watersheds and Delta ecosystem, including maintenance of viability of native fishes, will require comprehensive approach to management of their habitats and other factors that affect viability. The Parties propose an approach that integrates flow and non-flow measures, including management of tidal energy, to optimize outcomes of implementation; and establishes a science and monitoring program to evaluate, adjust, and achieve such outcomes.

- a. The Parties will develop Agreements consistent with the terms of this Framework and Appendix 1, and will cooperate in environmental analysis, as needed for the State Water Board to take final action by December 31, 2019. Implementation will begin immediately thereafter.
- b. Implementation will maintain viability of native fishes in the Sacramento River and San Joaquin River watersheds and Delta ecosystem, while concurrently protecting and enhancing water supply reliability, consistent with the statutory requirement of providing reasonable protection for all beneficial uses.

2. This Agreement Framework results from two years of negotiations by CDFW, CDWR, California Natural Resources Agency, Bureau of Reclamation, municipal and agricultural water suppliers, and other stakeholders to develop this comprehensive approach.

3. To date, Bay-Delta Plans have required changes in flow in isolation from the multiple other factors affecting fish and wildlife beneficial uses, including physical modifications of riverine channels and wetlands. The viability of native fishes has declined notwithstanding implementation of these plans.

- a. In the update process now underway, State Water Board staff have not proposed to require measures to address such other factors that affect viability. See Phase 1 SED, Master Response 5.2, p. 6.
- b. The State Water Board has recognized that a comprehensive approach may be implemented through voluntary agreements and could provide

quicker, more effective, and more durable outcomes. This Agreement Framework implements that recognition.

LEGAL TERMS

4. The Parties respectfully request that the State Water Board adopt the following schedule and procedures leading to the adoption of amendments to the Bay-Delta Plan and supporting environmental analysis under the Porter-Cologne Water Quality Control Act and the California Environmental Quality Act ("CEQA"):

- a. **February 15, 2019** – Completion of drafting the proposed voluntary agreements.
- b. **March 1, 2019** – Submission by Parties to the State Water Board of a project description for the Bay-Delta Plan based on the voluntary agreements.
- c. **August 1, 2019** – Submission by Parties to the State Water Board of an administrative draft of a Comprehensive SED that is based on the project description. For this purpose, "Comprehensive" means that it will supplement the Phase 1 SED and integrate information pertaining to the Phase 2 update.
- d. **September 1, 2019** – Circulation by the State Water Board staff of a draft Comprehensive SED for a 45-day public comment period.
- e. **December 1, 2019** – Submission by Parties to the State Water Board of an administrative draft of a final Comprehensive SED.
- f. **As early as possible after December 1, 2019** – Consideration by the State Water Board of the certification of the Comprehensive SED and adoption of the proposed amendments to the Bay-Delta Plan, followed promptly by execution of the Agreements.

5. CDFW and CDWR propose to participate as CEQA responsible agencies in developing the Comprehensive SED.

6. The Parties agree that the Agreements will be enforceable under specified terms consistent with the State Water Board's responsibilities. Each Agreement will have a minimum 15-year term.

7. This Agreement Framework is not precedent on any disputed issues of law or fact.

SUBSTANTIVE TERMS

A. Flow Measures

8. The Agreement Framework builds upon and assumes that existing implementation responsibilities for the 2006 WQCP remain in effect, other than as addressed through the Agreements. The Parties propose to provide additional instream flows as summarized in Table 1. Appendix 1 states the terms the Parties have reached in principle.

Table 1. Summary of Annual Average Additional Flows in San Joaquin and Sacramento Basins

Contributing Area	Volume (TAF)	Seasons (AN, BN, Dry)	Proposed Sources
San Joaquin Basin <ul style="list-style-type: none">• Tuolumne¹• Friant²	140	Spring, summer	<ul style="list-style-type: none">• Reservoir reoperation, storage withdrawal, restoration flow recapture reduction
South-of-Delta	300-600	Spring, summer	<ul style="list-style-type: none">• SWP and CVP
Sacramento Basin <ul style="list-style-type: none">• Sacramento• American³• Feather• Yuba• Mokelumne	300	Spring, summer	<ul style="list-style-type: none">• Land fallowing (35,000 acres)• Reservoir reoperation• Potential for limited groundwater substitution
Total	740 – 1,040 TAF		

9. The Parties propose to provide additional flows in a manner that: (a) does not conflict with the requirements of the Sustainable Groundwater Management Act; (b) does not reduce existing flows for designated wildlife refuges; and (c) maintains reliability of water supply for other beneficial uses. The Agreements may provide for adjustment of flow amounts in successive dry years and immediately subsequent years for the purpose of ensuring reliable reservoir storage.

B. Habitat Improvements and Other Non-Flow Measures

10. The Parties propose to undertake non-flow measures to improve the current condition of fish and wildlife beneficial uses in the Delta ecosystem. Appendix 2 consists of maps which illustrate the proposed general locations and scales of habitat measures.

¹ Tuolumne's proposal also includes managed flows in Critical and Wet year types.

² Friant is not a party identified in the Phase I or Phase 2 Bay-Delta Plan update process.

³ American's proposal includes managed flows in Critical year types.

11. The Parties propose to undertake measures to address multiple factors affecting fish and wildlife beneficial uses, including predation by non-native species, passage barriers, and hatchery productivity. The Parties propose to ensure timely completion of all measures specified in the Agreements. The Parties propose to maintain and adaptively manage successful restoration measures which they have already funded, constructed, or currently operate, in any combination. The Parties propose to provide a more comprehensive discussion of habitat quantities and suitability to support the development of the project description provided in 4(b) of this Framework Proposal.

12. Appendix 3 identifies environmental improvements that Parties propose to implement in 2019, assuming environmental review, the continued availability of funding that has been committed to them, and the issuance of necessary federal permits, such as permits under Clean Water Act sections 404 and 408. CDFW commits to expedite its review of any applications for permits necessary for these improvements to the maximum extent possible consistent with applicable law. CDFW and DWR respectfully request that the State Water Board similarly expedite any review of those projects that the State Water Board conducts and also to direct each applicable Regional Water Quality Control Board to also expedite any necessary reviews. CDFW and DWR will formally request that the United States Departments of Commerce and Interior, as well as the United States Army Corps of Engineers, also expedite all necessary federal approvals for these projects.

C. Integrated Management of Flow and Other Measures

13. The Parties propose to integrate management of flow and non-flow measures, to optimize benefits to fish and wildlife, including through management of existing and additional flows, tidal energy, and through habitat improvements. For anadromous fisheries, the Parties propose this approach to improve water temperatures for all life stages, and to increase access to floodplains as rearing habitats. For pelagic fisheries, the Parties propose to improve the water quality variables that affect viability, including salinity, flow velocity, and turbidity. Appendix 2 consists of maps that exemplify the integrated approach.

D. Science and Monitoring Program / Structured Decision-making

14. The Parties propose a comprehensive science and monitoring program that informs implementation of the flow and non-flow measures.

15. The science and monitoring program will include the following elements, except as specifically provided in the Agreements.

- a. **Implement specific experiments.** The science and monitoring program will adopt a “safe to fail” experimental approach to maximize learning.
- b. **Test hypotheses.** The science and monitoring program will identify and test key hypotheses, especially/even if conflicting, about how the

ecosystem functions and what measures will be most effective at achieving desired outcomes.

- c. **Learn from the experiments.** The science and monitoring program will ensure that each measure is implemented in a manner that maximizes learning.
- d. **Design the experiments to test specific outcomes.** The science and monitoring program will identify a manageable set of SMART (specific, measurable, achievable, relevant, and time-bound) objectives that describe desired environmental and biological outcomes.
- e. **Facilitate a collaborative process.** All Parties will be engaged in the development and implementation of the science and monitoring program.
- f. **Facilitate a transparent process.** All Parties will engage in a transparent process by collaborating, reporting, and sharing data.

16. The science and monitoring program will include a structured decision-making process to inform implementation of flow and non-flow measures. CDFW and DWR anticipate that this science and monitoring program would be overseen by an entity such as the Delta Independent Science Board in order to facilitate the production of neutral, peer-reviewed science to guide further restoration and protection efforts in the Sacramento River and San Joaquin River watersheds and Delta ecosystem. CDFW and DWR intend to propose that terms to guide this science and monitoring program will be part of the proposed amendments to the Bay-Delta Plan.

E. Funding

17. The Parties propose to utilize dedicated funds consisting of (a) contributions based on deliveries to or diversions by the Parties, and (b) repurposing of existing funding. The contributions will be collected annually during the term of the Agreements. Through the contributions, the Parties expect to secure funds totaling approximately \$425 million for the additional flows, and \$345 million for the science program, over the term of the Agreements. Appendix 1 contains the details of these funding arrangements. Table 2 provides the proposed contribution to the funds, except as provided for in Attachment 1.

Table 2. Contribution to Funds⁴

Delivered Water	Contribution to Water Purchase Fund	Contribution to Structural Habitat and Science Fund
CVP/SWP water	\$5/acre-foot	\$2/acre-foot
Water diverted by the Sacramento River Settlement Contractors (base and project) or Feather River Diversion Agreement Parties		\$1/acre-foot
Non-project water diverted by party contributing water under the terms of the Agreement Framework		\$2/acre-foot
Non-project water diverted by party not contributing water under the terms of the Agreement Framework	\$10/acre-foot	\$2/acre-foot

F. Other Terms

18. Although the State Water Board will have authority to enforce implementation of flow and non-flow measures, as stipulated in the Agreements, the State Water Board will not enforce or otherwise regulate the funding arrangements.

19. Each potential effort, project and/or activity listed in this Agreement Framework has been or will be fully evaluated in compliance with applicable law, including, but not limited to, the National Environmental Policy Act and California Environmental Quality Act. This Agreement Framework does not, and is not intended to, bind any party to a definite course of action or limit in any manner the discretion of the United States, State of California, any other public agency, as applicable, in connection with consideration of the efforts described in this Agreement Framework, including without limitation, all required environmental review, all required public notice and proceedings, consideration of comments received, and the evaluation of mitigation measures and alternatives, including the “no action” or “no project” alternatives.

⁴ Except as provided for in Attachment 1.

Appendix 1: Proposed Tributary Term Sheets

Addendum A: Sacramento River

Addendum B: Feather River

Addendum C: Yuba River

Addendum D: American River

Addendum E: Mokelumne River

Addendum F: Tuolumne River

Addendum G: Friant Division

Addendum H: Delta

Addendum A

Sacramento River Mainstem Proposal

Purpose:

The Mainstem Sacramento actions include habitat restoration designed to work with existing winter and spring flows. The habitat improvements target improved growth, survival, diversity, and abundance of the four runs of Chinook salmon and steelhead on the Sacramento River. Additionally, 100,000 acre-feet of water, available from fallowing approximately 24,000 acres, would be available to increase flows improving salmonid outmigration survival and increase Delta outflow.

Proposed Commitments:

Flow

Fall Flow Stabilization (in every year type)

Minimize fall-run spawning impacts during transition from summer/fall flows to winter base flows. Other benefits include increased rearing habitat for juvenile salmonids and conserving cold water storage for winter Chinook spawning and egg incubation in the following late spring through early fall.

Description of Proposal: Demands by the National Wildlife Refuges, upstream CVP contractors, and the Sacramento River Settlement Contractors in October result in Keswick releases that are generally not maintained throughout the winter due to needs to store water for beneficial uses the following year. These releases result in some early fall Chinook redds being dewatered at winter base flows.

Following the emergence of winter Chinook and prior to the majority of fall Chinook spawning, upstream Sacramento Valley CVP contractors and the Sacramento River Settlement Contractors propose to work to synchronize their diversions to lower peak rice decomposition demand. With lower late October and early November flows, fall Chinook are less likely to spawn in shallow areas that would be subject to dewatering during winter base flows. Reductions would balance the potential for dewatering late spawning winter-run redds.

Targets for winter base flows from Keswick would be set in October and would be based on Shasta Reservoir end-of-September (EOS) storage. These base flows would be set based on historic performance to accomplish improved refill capabilities for Shasta reservoir to build cold water pool for the following year.

Below are examples of Keswick Releases based on Shasta storage condition – these would be refined through modeling efforts:

Keswick Release	Shasta EOS Storage
3,250 cfs	< 2.2MAF
4,000 cfs	< 2.8MAF
5,000 cfs	> 3.2 MAF

Governance/Decision Making: Following the emergence of winter Chinook and prior to the majority of fall Chinook spawning, upstream Sacramento Valley CVP contractors and the Sacramento River Settlement Contractors propose to work together to smooth Sacramento Valley CVP contractor diversions to improve the ability to reach the desired winter base flow targets when possible. Reclamation retains discretion over all CVP operations and propose to operate to downstream needs (e.g. Sacramento River or Delta). Furthermore, Reclamation makes operational decisions based on the CVP as a whole, and in accordance with any requirements under then-applicable Biological Opinions issued by federal fisheries agencies.

Additional Water Provided (Dry, Below Normal, Above Normal Year Types)

Dedicate 100,000 acre-feet of water for instream flow purposes focused in April and May to improve juvenile salmonid outmigration survival. This additional water would also contribute to increased Delta outflow while minimizing impacts to Shasta cold water pool.

Description of Action: In the spring, Keswick releases are typically steady until flows are needed to support instream demands on the mainstem Sacramento River and Delta requirements. As a standard practice, Reclamation operates Shasta in the spring to have storage in the reservoir high enough to use the Shasta temperature control device (TCD) upper shutters by the end of May to maximize the cold water pool potential for winter Chinook egg incubation management.

The Parties propose to utilize the 100,000 acre-feet made available through the land-fallowing program to make releases from Shasta, initially focused on April and May, for the primary purpose of increasing spring-run Chinook outmigration and survival in the lower Sacramento River, incorporating science, monitoring, and decision making and testing the hypothesis of flow and survival.

Based on initial review of historic data, the Parties believe that in the majority of these years, the spring pulse flow utilization of water can be accomplished. The fall stabilization action and targeted winter Keswick release is expected to further improve the likelihood and additional certainty regarding the ability to refill of Shasta Reservoir to attain appropriate storage levels under typical hydrological conditions associated with these year types to allow for the spring action to occur. If Reclamation determines that projected inflows to Shasta Reservoir are less than sufficient for summer temperature management pursuant to its ESA obligations, and/or taking the spring action would cause changes to water supply allocations and/or the timing of allocations (to each CVP division north or south of the Delta), or the action impacts other system-wide operations, the water would be added to releases during the summer or fall for other ecosystem benefits, and would serve to augment Delta outflows at those times.

A method for accounting for the 100,000 acre-foot release over the baseline release would be developed as the program of implementation is further refined. Timing and shaping of flows using the water would be based on testable hypotheses developed by the governance group described below.

Governance/Decision Making: Currently, the Sacramento River Temperature Task Group provides input to Reclamation on the operations in the winter/spring on Shasta Releases,

temperatures, spring flows, and cold water pool. The Parties would develop new governance to implement this action.

Actions in Wet Years (Wet Year Types only)

Proposed alteration to timing of Shasta Reservoir releases to support increased salmonid out-migration survival and floodplain habitat.

Description of Action: Reclamation currently generally operates Shasta Reservoir pursuant flood control and safety of dams requirements and procedures.

When inflow into Shasta Reservoir is forecasted to exceed the flood control requirements, Reclamation proposes early initiation of storage management releases for the purposes of spawning gravel cleaning functions, floodplain habitat, general fish migration flows and moderation of flood control-related pulse flows. The action would be subject to Reclamation's determination that there would be absolutely no elevated risk to public health, human safety, or property damage, and that there would be no water cost to the Projects.

Governance/Decision Making: Reclamation retains sole discretion over releases and other actions related to storage management for flood control.

Proposed Actions in Critical Years (Critical Year Types only)

Proposal to provide instream flows during critical years to support salmonid out-migration and temporary in-stream floodplain habitat.

Description of Proposed Action: In most critical years, the spring inflow into Shasta Reservoir is less than optimal and flows at Wilkins Slough are at times equal to or less than Shasta inflow. Significant runoff events that increase base flows on the Sacramento River are generally less frequent.

Reclamation proposes to provide a single spring pulse flow of 30,000 acre-feet in March, with a focus on last two weeks of the month. The water can be made available from Shasta or Whiskeytown reservoirs at Reclamation's sole discretion. The pulse would be timed to ensure that the water is 100% recoverable by the CVP and SWP through Delta exports (or other mechanisms at the discretion of Reclamation), as addressed through COA accounting. The action would be coupled with a storm event when possible, likely as an extension of the recession limb of rainfall runoff to ensure exportability.

The action would not occur if any of the following conditions occur:

- The action causes any impact to the amount or timing for Reclamation's allocations to any CVP contractors (in any CVP Division, north or south of the Delta).
- The Critical year in question immediately follows a Critical or Dry Year.
- Any new or additional RPMs, RPAs, or other regulatory actions affecting Project operations occur as a result of this action.

The action would also take into consideration temperature management considerations for the remainder of the year.

If the year type turns from Critical to Dry, any water released for this pulse action would be counted towards the 100,000 acre-foot commitment as outlined above for other year types.

Habitat

Spawning Habitat Keswick to Red Bluff Diversion Dam

Propose to annually place 40,000 to 55,000 tons of gravel at the Keswick and/or Salt Creek injection site(s). Propose to create at least three site-specific gravel restoration projects upstream of Bonnyview Bridge within 5 years.

Projects that could be implemented in 2019 include: Salt Creek Gravel Injection Site; Keswick Dam Gravel Injection Site; South Shea Levee, Shea Levee; and, Tobiasson Island Side Channel.

Rearing Habitat Keswick to Red Bluff Diversion Dam

Propose to create a total of 40 to 60 acres of side channel habitat at no fewer than 10 sites in Shasta and Tehama County.

Project that could be implemented in 2019 include: Cypress Avenue; Shea Island; Anderson River Park; South Sand Slough; Rancheria Island; Tobiasson Side Channel; and, Turtle Bay.

Rearing Habitat Red Bluff Diversion Dam to Verona

Propose to enhance ~ 2,000 acres of floodplain habitat in the Sutter Bypass within the term of the Voluntary Agreement. Propose to provide fish passage and floodplain habitat at Tisdale Weir within 5 years and Colusa Weir within 10 - 15 years. Propose to complete the Hamilton City set back levee with appropriate floodplain habitat within 5 years. Inventory historic oxbows and design fish passage and floodplain projects within 5 years and implement projects within 10 years.

Projects that could be implemented in 2019 include: Tisdale Weir and Bypass Multi Benefit Project; and Hamilton City Levee Setback and Floodplain/Riparian Enhancement.

Man Made Structures Keswick-Verona

Propose to complete remaining high-priority fish screen projects. Propose to reduce lighting to 3 lux or less at fish screens and bridges within 5 years. Propose to incorporate ongoing redd dewatering coordination with Anderson Cottonwood Irrigation District into a Voluntary Agreement. Propose to address fish passage issues at Weir 1 and Weir 2 within 5 years.

Projects that could be implemented in 2019 include: reduced lighting at Sacramento River fish screens, reduced lighting at Sacramento River bridges; Sutter Bypass Weir 1 - Rehabilitation of weir structure and fish ladder (Coupled with new Lower Butte / Sutter Bypass water management plan); Sutter Bypass Weir 2 Multi Benefit Project; Screen Meridian Farms Water

Company; Screen Natomas Mutual Water Company; and, Anderson Cottonwood Irrigation District Dam operations to protect salmon redds.

Studies Keswick-Verona

Propose to design survival and predation studies within one year and implement them yearly for the term of the agreement.

Projects that could be implemented in 2019 include: Program to identify predation hot spot / adaptively manage for the reduction/improvement of predator contact points at man-made structures where predator interactions have been observed; Study route specific survival at key diversion facilities and implement appropriate devices that reduce route selection into lower survival areas; and study, design and implement modifications to known redd dewatering locations.

Funding Commitments:

The Sacramento water service and settlement contractor groups propose to contribute to the Water Purchase Fund and Structural Habitat and Science Fund.

Water Purchase Fund

- \$5 per acre-foot on Project Water Diverted

Structural Habitat and Science Fund

- SRSC contribute \$1 per acre-foot of all water diverted
- All other contractors contribute \$2 per acre-foot on all Project Water diverted

Addendum B Feather River Proposal

Purpose:

The Feather River proposal includes habitat restoration intended to work with existing and proposed Spring and Summer flows. The habitat improvements target improved growth, survival, diversity, and abundance of salmon and steelhead on the Feather River. Fifty-thousand acre-feet of water available from fallowing of 11,000 acres of agricultural land will be available to increase flows improving fish survival and providing for increases in Delta outflow.

Proposed Commitments:

1. Flow

As set forth in Table 1 below, the Feather River Settlement Contractors propose to provide for additional managed flows beyond current flow regimes on the Feather River to reestablish functionality of the habitat for native fishes.

Table 1. Additional Managed Flow

Water Quantity (TAF)	Implementation Date	Water Year Types
50	Spring or Summer ¹	Dry, Below Normal, Above Normal

In addition, DWR proposes to provide an immediate adjustment to river flow and temperature in the Feather River, as provided under the Federal Energy Regulatory Commission (FERC) Settlement Agreement (SA) for the Licensing of the Oroville Facilities, FERC Project No. 2100, to create additional spawning and rearing habitat by increasing useable area for adult and juvenile salmonids.²

Table 2. River Flow and Temperature Adjustments

Flow	
Flow Velocity (cfs)	Implementation Date³
700	April 1 – September 8
800	September 9 – March 31
Temperature	
Target (F, mean daily)	Compliance Point
56 – 63	Robinson Riffle

DWR also proposes to provide for re-operation of the Oroville facilities to maximize spawning and rearing in the Feather River for salmonids. Instead of routing flows through Thermalito Forebay and the power generation facilities at Oroville, a pulse flow would instead be routed

¹ Subject to coordination with fisheries agencies.

² This is included in the FERC SA. However, unlike the non-flow measures provided in the FERC SA, the Department of Water Resources would be able to implement this plan of operation immediately.

³ Implementation would occur for the duration of the current annual and future FERC license.

directly through the low-flow channel to create optimal conditions for fish in the upper Feather River.

Table 3. Pulse Flow

Water Quantity (TAF) – Average Annual	Pulse Velocity (cfs)	Date & Duration	Water Year Types
43	2,000	14 or more continuous days between January 1 – April 15	Dry, Below Normal, Above Normal

2. Non-Flow Habitat

The Parties propose to enhance and create riverine habitat sufficient to support salmon and sturgeon populations in the Feather River with specific years of implementation, as described in Table 4 below. These projects would target specific critical life stages for fish including spawning (S), rearing (R), migration (M), and adult migration (AM).

Table 4. New Riverine Habitat

Project	Description	Targeted Habitat	Years	Life Stage
Gravel augmentation	Improve substrate conditions for spawning salmonids at key riffles	25,000 cu. yd.	0-5 years	S
Remove Sunset Pumps and associated rock dam	Remove barrier/entrainment risk for upstream salmonid and sturgeon passage	Over 25 miles upstream	0 – 5 years	AM, M
Oroville Wildlife Flood Stage Reduction Project	Weir improvements and ecosystem restoration and Oroville Wildlife Area to allow floodplain access	100 – 600 acres	3 – 8 years	R
Nelson Slough Floodplain Restoration	Provide optimal habitat for floodplain rearing and reduce stranding during high flow events	20 acres	3 – 15 years	R
Abbott Lake Re-Connection/Restoration	Provide optimal habitat for floodplain rearing and reduce stranding during high flow events	440 acres	3 – 15 years	R
Star bend Setback Levee	Provide optimal habitat for floodplain rearing and reduce stranding during high flow events	50 acres	3 – 15 years	R
Feather River Setback Levee below Yuba River on River Left Floodplain	Provide optimal habitat for floodplain rearing and reduce stranding during high flow events	1,100 acres	3 – 15 years	R
Identification of Predation Hot Spots and Adaptive Management for Predator Reduction	Improve rearing and migration conditions by reducing predation	Entire reach of river	0 – 15 years	R, M

As set forth in Table 5 below, DWR proposes to accelerate the creation of riverine habitat under FERC SA for the Licensing of the Oroville Facilities, FERC Project No. 2100. This acceleration would be an improvement over the timing for completion of projects identified in the FERC SA and would occur within the FERC jurisdictional boundary.

Table 5. Accelerated Riverine Habitat in the FERC SA

Project⁴	Description	Years after FERC License	Life Stage
Habitat Improvement Plan (A101)	Develop and adaptive management plan to respond to restoration project feedback	2 years	All
Gravel Supplementation Improvement Program (A102)	File a gravel supplementation and improvement plan to respond to restoration project feedback	2 projects within 2 years; 5 within 5; 10 within 10	S
Channel Improvement Program (A103)	Creation and improvement of side channel habitat	Develop plan within 2 years; 3 channels in 5; all channels within 7	S, R
Structural Habitat Program (A104)	Installation of large woody debris, boulders, etc. and filing a plan for implementation	Submit plan within 1 year; implement within 2 years	R
Fish Weir Program (A105)	Filing plans for weir installation, installation of monitoring and segregation weirs	Install count weir within 1 year and segregation weir within 3	AM, S
Riparian Floodplain Program (A106)	Filing of recommendations for riparian projects, physical completion of projects	Screening level within 3 years; 1 project within 10; 2 projects within 15	R
Hatchery Improvement Implementation (A107)	Implementation of temperature targets, filing a hatchery genetics management plan (HGMP), data collection – minimize straying	Target hatchery temperatures and data collection immediately; HGMP within 1 year	AM, S

3. Governance

Governance for the Feather River proposal will be consistent with the terms of the Agreement Framework.

4. Funding Commitments

The Feather River Contractors propose to help fund the science and monitoring program at a rate of \$1 per acre-foot of all water diverted.

⁴ Includes FERC SA project identifier (e.g., A104, A109, etc.).

Addendum C
Yuba Water Agency Proposal

This document summarizes the framework (Framework) that the California Department of Water Resources, the California Department of Fish and Wildlife (CDFW) and Yuba Water Agency (YWA) have approved in concept for the voluntary agreement (Voluntary Agreement).

1. The Voluntary Agreement will be based on foundational principles that are set forth in the Framework.
2. YWA would: (a) repurpose all Yuba Accord Released Transfer Water in April through June that cannot be accounted for as Delivered Transfer Water (as these terms are defined in the Yuba Accord Water Purchase Agreement); and (b) reoperate New Bullards Bar Dam and Reservoir by up to 50,000 acre-feet, to provide: (1) a Base Contribution of 9,000 acre-feet per year in above-normal, below-normal and dry-years; and (2) a Supplemental Contribution of up to an additional 41,000 acre-feet per year in above-normal, below-normal and dry-years, based on releases from storage with YWA's reoperation plan, to assist other agencies in meeting the Sacramento River Basin's Delta flow contribution target.
3. YWA would not receive any compensation for YWA's Base Contribution.
4. YWA would be paid \$290 per acre foot for all Supplemental Contribution water.
5. The Base Contribution is comparable and proportionate to YWA's proportionate share of the Yuba River watershed's comparable and proportionate share of flow contributions for Delta inflow from the Sacramento River Basin.
6. The Supplemental Contribution exceeds what would be YWA's comparable and proportionate share of contributions to Delta inflow.
7. YWA would make an annual payment to the Structural Science Fund of \$520,000.
8. All parties to the YWA Voluntary Agreement will support YWA's Amended Final License Application for the Yuba River Development Project.
9. CDFW would notify FERC of its support for the AFLA when YWA notifies it that YWA would provide the Supplemental Contribution prior to the execution of the Voluntary Agreement (i.e., early implementation of flow releases).
10. YWA would enhance a minimum of 100 acres of floodplain and in-channel habitat along the lower Yuba River.
11. YWA would contribute \$10 million for Habitat Enhancement Measures.
12. The parties to the YWA Voluntary Agreement would define the process for and respective obligations of the parties to select, fund, develop, operate, maintain and repair Habitat Enhancement Measures.

December 12, 2018

Addendum D American River Proposal

Purpose

The American River Parties believe that implementation of the flow, habitat and non-flow measures, described below, when integrated, would materially improve conditions for anadromous fish in the lower American River, maintain water supply reliability, and provide additional new water for purposes of improving ecosystem conditions in the Delta.

The American River flow, storage, habitat and infrastructure improvement actions are designed to work in harmony to improve conditions for all life stages of Central Valley steelhead and Fall-run Chinook salmon in the lower American River. The combined actions are also additive to the overall package of measures being undertaken in other tributaries and in the Delta to improve conditions for the Sacramento River and San Joaquin River watersheds and Delta ecosystem.

Proposed Commitments

A. Flows and Storage

i. Proposed Environmental Flow Commitments by American River Parties

- **Additional Water for Environmental Purposes.** The water provided by the American River Parties under the Voluntary Agreement would be in addition to and would be used to supplement the environmental flows described in the Attachment.
- **Groundwater Substitution Water.** American River Parties propose to make available a contribution of 10,000 acre-feet of groundwater substitution water in Sacramento Valley Index Critical and Dry years, for an upfront payment of \$15M (from a public source).
 - Calls for this water may be made in up to 6 Critical or Dry years during the 15-year term of the Voluntary Agreement.
 - The water made available in Folsom Reservoir under the voluntary agreement would be managed in a manner to meet identified biological objectives developed in the American River Group through a collaborative process. See Monitoring, Reporting, and Adaptive Management below. The stakeholders participating in the collaborative process propose to designate a single point of contact with authority to make decisions. Reclamation, CDFW, NMFS and FWS will retain their discretion to determine the biological objectives.
 - Depletion rates would be determined by BOR and DWR (currently 8%), in consultation with American River Parties, based on local conditions and data developed by American River Parties, or, absent a determination, based on white paper.

- Groundwater recharge would occur in wetter years, consistent with sustainable groundwater management principles.
- **Reservoir Reoperation Water.** American River Parties propose to make available an additional 10,000 acre-feet of reservoir reoperation water in Sacramento Valley Index Above Normal and Below Normal years, for a payment of \$290/acre-foot.
 - Calls for this water may be made in up to 6 Above Normal or Below Normal years during the 15-year term of the Voluntary Agreement.
 - The cost of this water would be paid out of the Water Purchase Fund.
 - This water would be subject to the then-applicable refill criteria.
- **Additional Dry Year Water.** In Sacramento Valley Index Dry years, American River Parties propose to make available an additional 10,000 acre-feet of water from reservoir reoperation and/or groundwater substitution, for a payment of \$290/acre-foot out of the Water Purchase fund.
 - All of the caveats relating to Reservoir Reoperation Water and Groundwater Substitution Water apply to this block of water.
- **Groundwater Bank.** If American River Parties are awarded bond funding for infrastructure improvements under Public Resources Code section 80114 or another public fund identified for supporting or facilitating the voluntary agreements, the American River Parties would produce up to 20,000 acre-feet of additional water in Sacramento Valley Index Critical and Dry years, under the following terms:
 - For each \$1 million dollars of funding received by the American River Parties, the American River Parties propose to make 500 acre-feet of additional water available, up to a maximum call amount of 20,000 acre-feet. Water would be made available for call within 18 months after the American River Parties receive the funding agreement.
 - Calls for this water may be made in up to 6 Critical or Dry years during the 15-year term of the Voluntary Agreement.
 - Depletion rates would be determined by BOR and DWR (currently 8%), in consultation with American River Parties, based on local conditions and data developed by American River Parties, or, absent a determination, based on white paper.
 - Groundwater recharge would occur in wetter years, consistent with sustainable groundwater management principles.

ii. **Lower American River Management Framework:**

- **Flows.** Within the Lower American River, Reclamation would adopt the minimum flow schedule and approach proposed by the Water Forum in 2017. Flows range from 500 to

2000 cfs based on time of year and annual hydrology. The flow schedule is intended to improve cold water pool and habitat conditions for steelhead and fall-run Chinook salmon.

- **Temperature Management.** The Parties would continue the existing water temperature planning and operations actions as described in the 2009 NMFS BiOps, including development of a temperature management plan every May which optimizes monthly temperature targets developed using latest reservoir operations forecast data. The purpose of the temperature management plan is to balance the habitat needs of rearing steelhead and fall-run Chinook salmon.
- **Folsom Reservoir Operations.** All of the following measures are subject to the understanding that Reclamation at all times retains all of its discretion to operate the CVP consistent with its authorizing acts and all other applicable legal authority.
 - Reclamation and the American River parties propose to work together using their expertise to define an appropriate amount of storage that represents the lower bound for typical forecasting processes in Folsom Reservoir at the end of calendar year (the "planning minimum"). The objective of the planning minimum is to preserve storage to protect against future drought conditions and to facilitate the development of the cold water pool when possible. This planning minimum will be a single value (or potentially a series of values for different hydrologic year types) to be used for each year's forecasting process into the future. To meet the objective identified above, Reclamation and American River parties propose to work together to determine the draft value(s) that they believe are appropriate. The draft value(s) for the planning minimum developed by the parties would also be shared with CVP contractors from outside of the American River Division, and the parties would meet with other CVP contractors to explain the basis of the selection of the draft value(s) and receive their comments. Reclamation would then determine its preferred value(s) for use in its forecasting process for guiding seasonal operations. The American River Parties acknowledge that Reclamation's selection of a preferred value is not a final agency action and is not subject to judicial review.
 - Reclamation and the American River Parties understand that the forecasted storage may fall below the planning level minimum due to a variety of circumstances and causes. As such, Reclamation and the American River Parties would develop a list of potential off-ramp actions that may be taken to either improve forecasted storage or decrease demand on Folsom.
 - Both the planning minimum value(s) and the list of potential off-ramp options would be completed before the Voluntary Agreement is executed.
 - In its forecasting process for guiding seasonal operations, Reclamation would plan to maintain or exceed the agreed-upon Folsom planning minimum at the end of the calendar year.

- When Reclamation estimates, using the forecasting process, that it would not be able to maintain Folsom Reservoir storage at the end-of-December planning minimum for that year type (such as in extreme hydrologic conditions) or unexpected events cause the storage level to be at risk, American River Division contractors would consult with Reclamation to identify and implement appropriate actions to improve forecasted storage conditions, and the parties would work together to educate the public on the actions that have been agreed upon and implemented and the reasons and basis for them. Reclamation would also meet with American River contractors and CVP Contractors from outside the American River Division in circumstances when potential changes to Folsom operations would have impacts on other parts of the system and when the actions need to be taken that affect the entire integrated system.
- In incorporating the planning minimum into its forecasting process, Reclamation recognizes the parties' shared goals of providing releases of salmonid-suitable temperatures to the lower American River and reliable deliveries (using the existing water supply intakes and conveyance systems) to American River water agencies that are dependent on deliveries or releases from Folsom Reservoir, as well as its obligations, including the terms of the American River settlement contracts and all of the purposes authorized for the American River Division as an integrated facility of the Central Valley Project.
- The parties recognize that, during the term of the Voluntary Agreement, changed circumstances may necessitate adjustments to the value(s) for the planning minimum. Any party may request that the technical group reconvene and that Reclamation re-evaluate its preferred value(s) based on the changed circumstances.
- Reclamation would ramp down to the revised minimum flows from Folsom Reservoir as soon as possible in the fall and maintain these flows, where possible, given all of the purposes authorized for the American River Division as an integrated facility of the Central Valley Project and consistent with required flood control operations, in the winter in an effort to maximize spring storage for the purpose of developing the largest possible annual cold-water pool.

iii. Non-Flow Proposed Commitments by the American River Parties

- 50 acres of anadromous fish spawning habitat, implementation costs split between local agencies and Reclamation. Parties may seek outside funding to offset their cost shares.
- 150 acres of anadromous fish rearing habitat, paid for by the Structural Habitat Science Fund and/or State bond funds.
- The Parties propose to work collaboratively to determine the highest value locations for habitat restoration within the watershed and will prioritize projects accordingly.

iv. **Conditions and Assumptions for All American River Parties'**
Proposed Commitments

- The terms and conditions of the FERC licenses and water rights settlement agreements will be implemented.
- Final terms and conditions for the Voluntary Agreement must be acceptable to Reclamation, the Water Forum and the governing bodies of the Parties.

Monitoring, Reporting and Adaptive Management

- American River Parties propose to continue the science program established by the Water Forum, including its monitoring, reporting, and adaptive management components. As noted above, the water made available in Folsom Reservoir under the voluntary agreement would be managed in a manner to meet identified biological objectives developed in the American River Group through a collaborative process.
- The collaborative process would consider potential uses of water made available by American River Parties, including, but not limited to, the following:
 - Improving cold water pool storage for steelhead rearing and fall-run Chinook spawning
 - Augmenting spring flows and improving temperatures to support juvenile outmigration and inundate floodplain habitat
 - Augmenting flows and improving temperature for fall-run Chinook salmon spawning
 - Augmenting Delta outflow
- The stakeholders participating in the collaborative process, including the agencies, would designate a single point of contact with authority to make decisions to participate in the meetings.

Early Actions Pending Completion of Voluntary Agreement and Environmental Review

- American River Parties would cooperate with CDFW, DWR and the Water Forum to implement, in 2019, a salmonid habitat restoration project on the lower American River consisting of the following elements: (1) approximately 3.35 acres of spawning habitat, and approximately 2.14 acres of rearing habitat, at Upper Sailor Bar; and (2) approximately 2.45 acres of spawning habitat, and 0.28 acres of rearing habitat, at Lower Sailor Bar. Implementation of this project is dependent on the continued availability of \$2.3 million in federal funds that have been committed to the Water Forum, as well as the issuance of Clean Water Act section 404 and 408 permits by the U.S. Army Corps of Engineers (USACE). CDFW and DWR would formally request that the USACE expedite the issuance of these permits and would coordinate with the Central Valley Flood Protection Board to support that USACE action. CDFW and DWR would expedite the issuance of any approvals for this project that are within their respective jurisdictions.

Funding Commitments

A. Proposed Contributions by American River Parties

- American River Parties would contribute \$2 per acre-foot for all water delivered for consumptive use by local agencies in the American River watershed to the Structural Habitat and Science Fund.
- To offset the cost of water and habitat needed to implement the voluntary agreement, American River Parties propose to pay an additional \$5 per acre-foot on all CVP water service water and Warren Act water delivered through Project facilities, except for pre-1914 water rights water conveyed subject to a Warren Act contract, which will not pay the \$5 charge.
- The \$5 per acre-foot fee would be deposited the Water Purchase Fund.

B. Proposed Local Expenditure of Funds Collected

- The Parties recognize that the American River Parties have a long history of managing the American River watershed for environmental purposes through a multi-party collaborative effort led by the Water Forum, which the American River Parties have funded themselves for the last twenty years, pursuant to the Water Forum Agreement.
- To continue to support the Water Forum's efforts, for every \$2 contributed to the Sacramento Watershed Habitat and Science Fund over the term of the 15-year voluntary agreement, Reclamation would direct \$1.75 of benefits to be returned to the American River region for the purpose of funding local science and habitat, and \$0.25 would be directed to Delta science and habitat efforts.
- The Parties recognize that the American River Parties have been, for many years, investing in regional water supply infrastructure which can help reduce their reliance on flows from the American River, and the Parties desire to continue to support these efforts during the term of the Voluntary Agreement. Therefore, to offset the costs of or otherwise support the American River Parties' implementation of the voluntary agreement, of the funds collected in the Water Purchase Fund, each American River Party would be provided funds in an amount equivalent to the amount contributed by each party, to be expended locally by the water supply agencies. These funds would not be used to pay for or purchase the water made available under the Voluntary Agreement. Release of these funds would not be subject to federal budgeting processes or appropriations. These funds may be used by the local agencies for any legal purpose, including, but not limited to, projects to improve water supply reliability, infrastructure built in the service area that has reliability benefits in the service area, and projects that may have regional water supply benefits. The Parties propose to agree on an appropriate mechanism for the local agencies to claim the funds.

Proposed Implementation, Related Approvals and Support

- Provided that the improvements are deemed non-reimbursable, Reclamation would agree to support and advocate for the completion of Folsom temperature infrastructure

improvements during the term of this agreement. These improvements would include improving efficiency of the existing temperature shutters. Reclamation and the American River Parties agree that completing the planned improvements to the temperature shutters concurrently with the planned flood raise for Folsom Dam would provide multiple benefits. Reclamation would use its best efforts to urge the Corps of Engineers to complete improvements to the temperature shutters on this schedule. Reclamation would also continue to collaborate to develop a feasible modified penstock intake to access maximum extent of cold-water pool and minimize need for power production bypass to the extent reasonable.

- Reclamation and the California Department of Fish and Wildlife would agree to make physical and operational improvements to the Nimbus hatchery to ensure efficient production of healthy anadromous fish to meet the obligated mitigation spawning requirements. Reclamation would provide \$2.5 M of capital funds for these improvements, subject to appropriations and limits imposed by federal law.
- The Parties propose to prepare a written agreement containing these terms and would execute it once they secure final approval from governing bodies.
- The Parties propose to agree to support all necessary regulatory, legislative and legal actions required to implement this proposal as allowed by law. It is intended that implementation of this operational framework for Folsom would resolve all of the parties' disputes regarding Folsom operations. An initial list of measures to be supported would be provided to the parties.

LOWER AMERICAN RIVER

- STANDARDS FOR MINIMUM FLOWS -

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The following are the standards for calculating Minimum Release Requirements (MRRs) that the Water Forum submitted to the State Water Resources Control Board in 2017.

1 HYDROLOGIC INDICES

Hydrologic indices of water availability are used in these Standards to scale MRRs from Nimbus Dam to water year type. Lower MRRs are prescribed in drier years and higher MRRs are prescribed in wetter years. The MRRs are updated each month from January through May based on updated forecasts and indices for the water year. During the latter portion of the year (June through December), MRRs are based on the May index, because at that time the majority of the precipitation has occurred in the watershed (i.e., the amount of water available is fairly certain). The criteria used to develop the most appropriate hydrologic index were that the index was well established, publicly available or easy to calculate, accurate, available January through May, and updated monthly as the water year progressed. The two indices that were selected to specify the MRR were the SRI for the month of January, and the ARI for the months of February through December. Each index is described below.

1.1 SACRAMENTO RIVER INDEX

The SRI, previously referred to as the “4 River Index” or “4 Basin Index,” is published by the California Department of Water Resources (DWR) each year on December 1, January 1, February 1, March 1, April 1, and May 1 for several exceedance levels. The value of the SRI at 75% exceedance is used for determining the MRR in January (Figure 1). The SRI can be found at http://cdec.water.ca.gov/cgi-progs/iodir_ss/wsi. DWR computes the SRI by adding the forecasted unimpaired flow for the water year from the Sacramento River above Bend Bridge, the Feather River at Oroville, the Yuba River near Smartsville, and the American River below Folsom Reservoir.

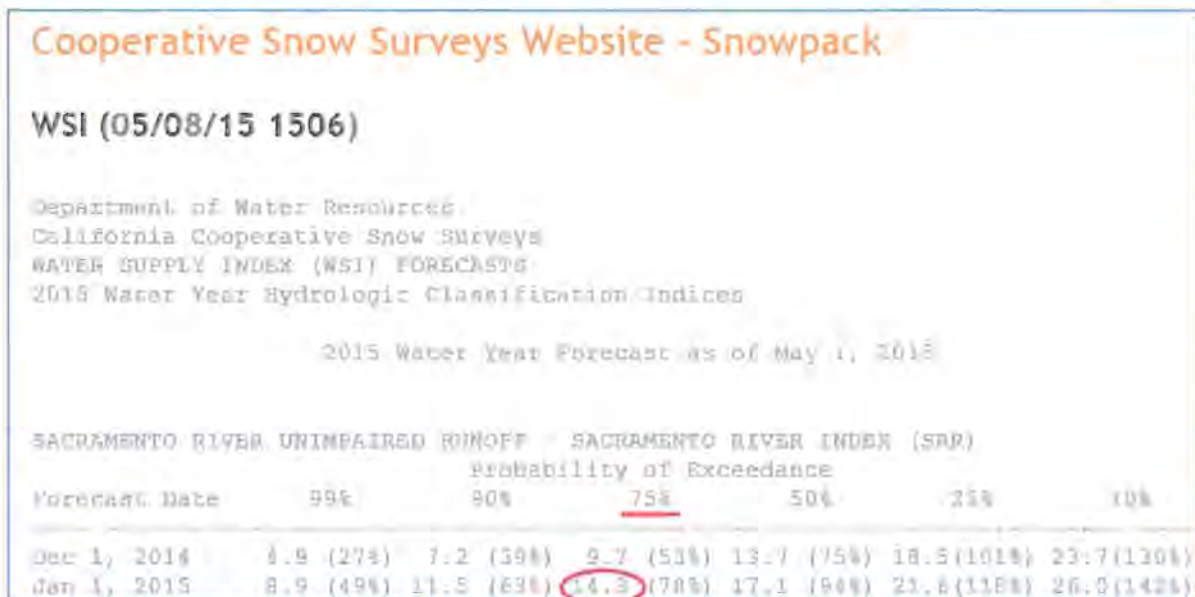


Figure 1. Excerpt from the California Data Exchange Center website showing the Sacramento River Index value at 75% exceedance.

1.2 AMERICAN RIVER INDEX

The ARI is a measure of the unimpaired inflow to Folsom Reservoir minus the amount of “spill” water that could not be captured at the reservoir (unimpaired runoff minus spill flows). The equations for calculating the ARI are provided in Table 1.

The unimpaired inflow used in the ARI is based on the DWR “Bulletin 120, Water Conditions in California” (B120) estimate of unimpaired water year runoff in the “American River below Folsom Lake.” DWR initially publishes the B120 each year in early February, and subsequently publishes the March, April, and May B120 on the 6th working day of each month. Between the monthly B120 publications and after the May publication, DWR publishes weekly updates reflecting current snow pack and precipitation monitoring information. The final weekly update is typically released in early June, but depending on conditions, the release of weekly updates can extend into mid-or late-June.

Table 1. Equations to calculate the American River Index.

Variable & Units	Equation/Calculation Method	Description and Citations
ARI _{i,j} (TAF)	$ARI_{i,j} = B120\ WY\ Forecast_{i,j} - Folsom\ WYTD\ Spill_{i,j}$	American River Index for water year i estimated based on data available in month j.
B120 WY Forecast _{i,j} (TAF)	Published Bulletin 120.	DWR Bulletin 120, 50% exceedance “water year forecast” in the “American River below Folsom Lake” for water year (WY) i published in month j.
Folsom WYTD Spill _{i,j} (TAF)	$\sum_{k=Oct\ 1}^{End\ of\ Month\ j-1} (Spill_k\ (cfs) + ContReg_k\ (cfs)) \cdot 0.001983$	The water-year-to-date (WYTD) i volume of the Folsom Dam spillway and/or control regulating discharge (ContReg) for each day k through the end of month j as reported by DWR’s California Data Exchange Center website; where Spill = spillway discharge (cfs) and ContReg = control regulating discharge (cfs), but only control regulating discharges related to avoiding reservoir spills, not releases used for temperature control in the fall or other discretionary releases

B120 provides both a forecast of monthly unimpaired flows for the water year (October through September), a forecast of water year unimpaired runoff, commonly referred to as the median forecast, and an 80 percent probability range, that essentially defines the 10 percent and 90 percent exceedance levels. DWR’s B120 publications can be found at <http://cdec.water.ca.gov/snow/bulletin120/index.html>. An excerpt of pages 4 and 5 from B120 is shown in Figure 2. The median value (“Water Year Forecast”) is used in computing the ARI.

The amount of spill water in the ARI computation is the cumulative water-year-to-date (WYTD) amount of discharge from the Folsom Dam Spillway and the Control Regulating Gates as reported by DWR’s California Data Exchange Center (CDEC) website (http://cdec.water.ca.gov/cgi-progs/queryCSV?station_id=FOL) as shown in Figure 3. However, only “Control Regulating Gate” discharges related to avoiding reservoir spills are used in the calculation, not releases used

FEBRUARY 1, 2014 FORECASTS APRIL 1991 UNIMPAIRED RUNOFF													FEBRUARY 1, 2014 FORECASTS WATER YEAR UNIMPAIRED RUNOFF ⁽¹⁾												
HYDROLOGIC REGION and Watershed													HYDROLOGIC REGION and Watershed												
COMPARISON OF 1991 AND 1994 ⁽¹⁾													COMPARISON OF 1991 AND 1994 ⁽¹⁾												
HISTORICAL													HISTORICAL												
FORECAST													FORECAST												
1991													1991												
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Lower American River Criteria for Minimum Flows



Figure 3. Excerpt from the California Data Exchange Center website for the Folsom (FOL) Station showing hyperlinks to the daily flow data for the “Spillway” and “Control Regulating” discharges.

The ARI is initially determined in early February when the February B120 is released. The ARI is then updated for each B120 publication for the months of March, April, and May, and subsequent updates after the May publication, by subtracting the spills through the end of the preceding month from the B120 forecast (e.g., for the May ARI, October 1 through April 30 spills are subtracted from the May B120 forecast). The ARI value computed from the final B120 update each year is the final ARI for the year and remains in effect until the end of December.

2 DETERMINATION OF THE MONTHLY MINIMUM RELEASE REQUIREMENTS

The monthly MRR at Nimbus Dam is determined using SRI index values (for January) and ARI index values (for February through December), and the MRR implementation curves. **Table 2** summarizes the specified values associated with points A, B, and C in **Figures 4 through 9**, which show the specific MRR implementation curves for various months of the year. The MRR for index values between points specified on the table are calculated by linearly interpolating between specified points. At any point on the curves, the MRR value would specify the minimum release, but would not preclude releases at rates above the MRR.

Table 2. Summary of Hydrologic Indices and specified values for the Minimum Release Requirements.

Months	Hydrologic Index Used	Point A		Point B		Point C		
		Index Value (TAF)	MRR Value (cfs)	Index Value (TAF)	MRR Value (cfs)	Index Value (TAF)	MRR Value (cfs)	
Jan	SRI	5,500	500	7,800	800	11,500	1,750	
Feb – Mar	ARI	800		1,000		1,958	1,750	
Apr – Jun						2,210	1,500	
Jul – Sep ¹						1,958	1,750	
Oct				1,500		1,914	1,500	
Nov – Dec						2,210	2,000	

¹The July through September curve includes an additional point between points B and C, corresponding to an ARI of 1,200 TAF and an MRR of 1,500 cfs.

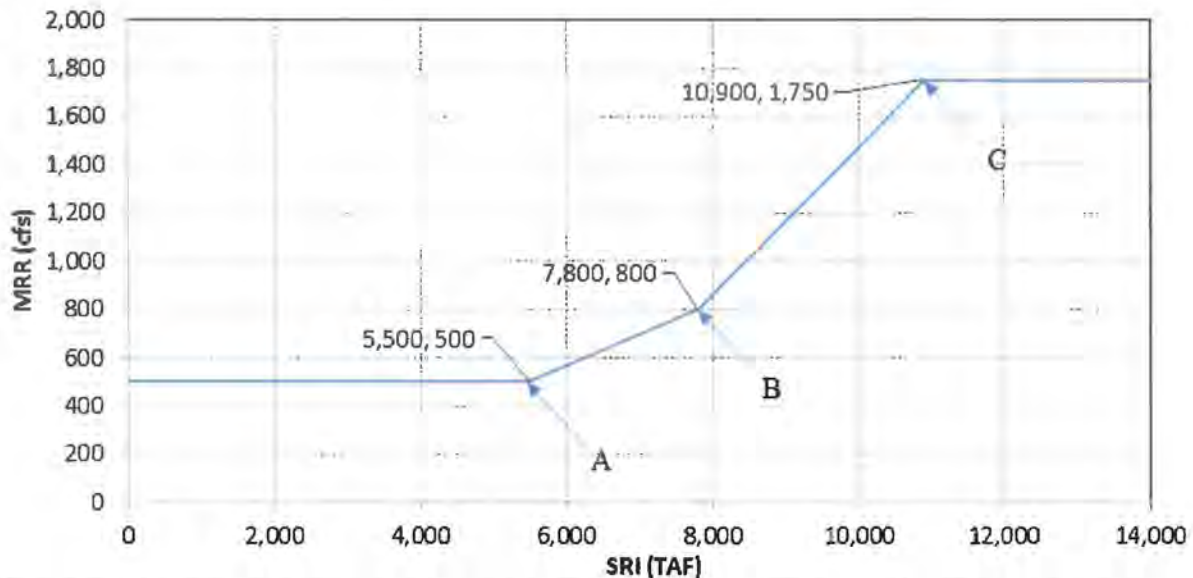


Figure 4. Relationship between the Sacramento River Index and monthly Minimum Release Requirements for January.

For January, the following equations can be used to determine the MRR for a given SRI:

- If $SRI \leq 5,500$ TAF, then $MRR = 500$ cfs
- If $5,500 \text{ TAF} < SRI \leq 7,800$ TAF, then $MRR = 0.1304 * SRI - 217$ cfs
- If $7,800 \text{ TAF} < SRI \leq 11,500$ TAF, then $MRR = 0.2568 * SRI - 1203$ cfs
- If $SRI > 11,500$ TAF, then $MRR = 1,750$ cfs

In recognition of the uncertainty associated with the SRI forecast, the January MRR is not allowed to be greater than the December MRR.

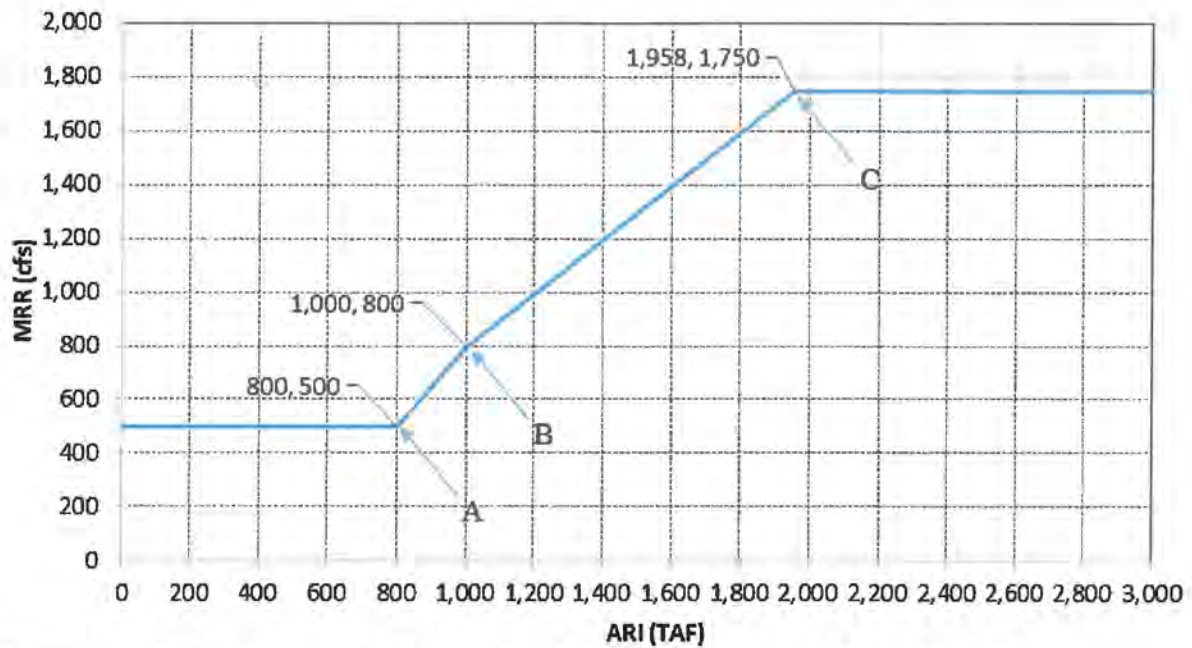


Figure 5. Relationship between the American River Index and monthly Minimum Release Requirements for February and March.

For February through March, the following equations can be used to determine the MRR for a given ARI:

- If $ARI \leq 800$ TAF, then $MRR = 500$ cfs
- If $800 \text{ TAF} < ARI \leq 1,000$ TAF, then $MRR = 1.500 * ARI - 700$ cfs
- If $1,000 \text{ TAF} < ARI \leq 1,958$ TAF, then $MRR = 0.9916 * ARI - 192$ cfs
- If $ARI > 1,958$ TAF, then $MRR = 1,750$ cfs

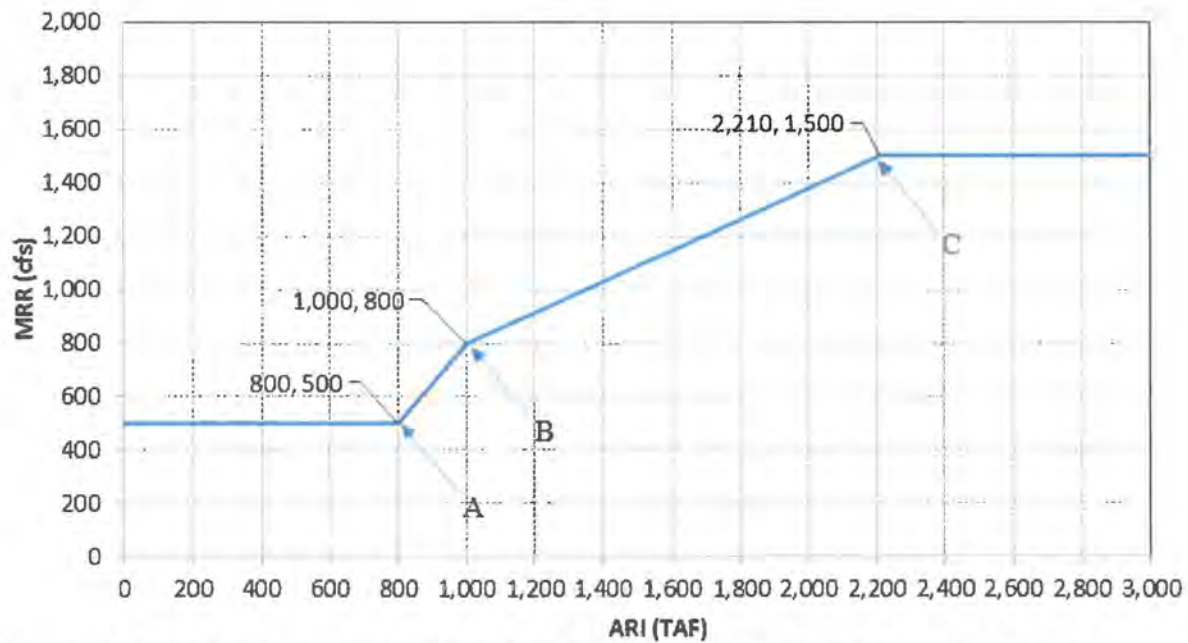


Figure 6. Relationship between the American River Index and monthly Minimum Release Requirements for April through June.

For April through June, the following equations can be used to determine the MRR for a given ARI:

- If $ARI \leq 800$ TAF, then $MRR = 500$ cfs
- If $800 \text{ TAF} < ARI \leq 1,000$ TAF, then $MRR = 1.500 * ARI - 700$ cfs
- If $1,000 \text{ TAF} < ARI \leq 2,210$ TAF, then $MRR = 0.579 * ARI + 221$ cfs
- If $ARI > 2,210$ TAF, then $MRR = 1,500$ cfs

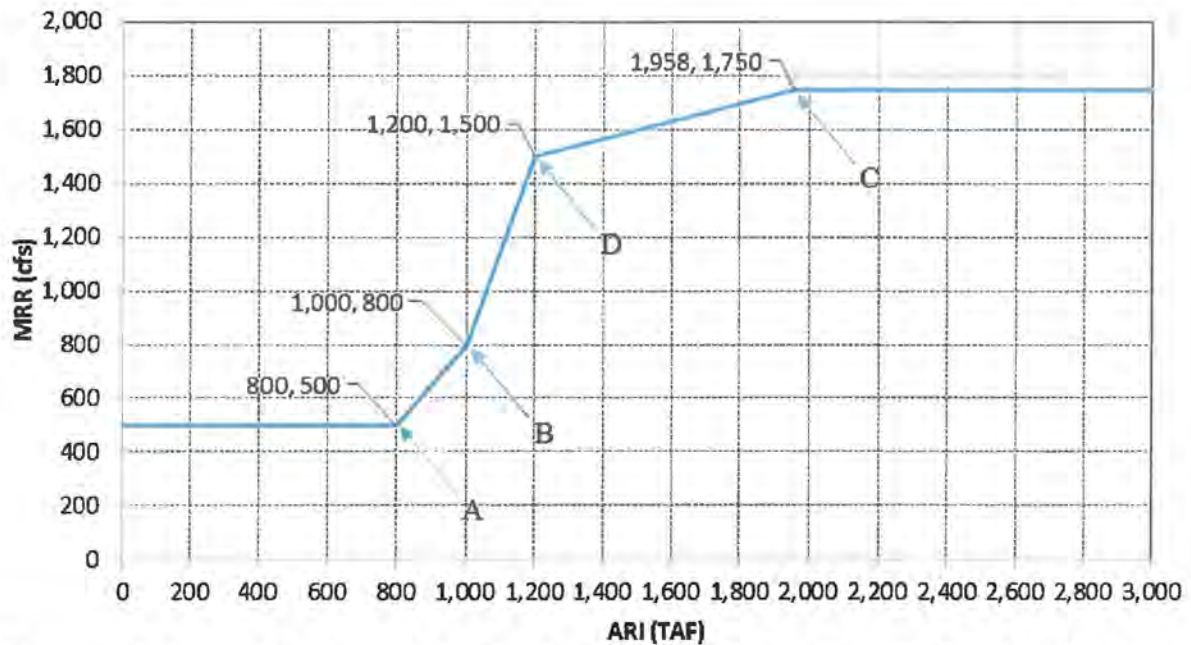


Figure 7. Relationship between the American River Index and monthly Minimum Release Requirements for July through September.

For July through September, the following equations can be used to determine the MRR for a given ARI:

- If $ARI \leq 800$ TAF, then $MRR = 500$ cfs
- If $800 \text{ TAF} < ARI \leq 1,000$ TAF, then $MRR = 1.500 * ARI - 700$ cfs
- If $1,000 \text{ TAF} < ARI \leq 1,200$ TAF, then $MRR = 3.500 * ARI - 2,700$ cfs
- If $1,200 \text{ TAF} < ARI \leq 1,958$ TAF, then $MRR = 0.330 * ARI + 1,104$ cfs
- If $ARI > 1,958$ TAF, then $MRR = 1,750$ cfs

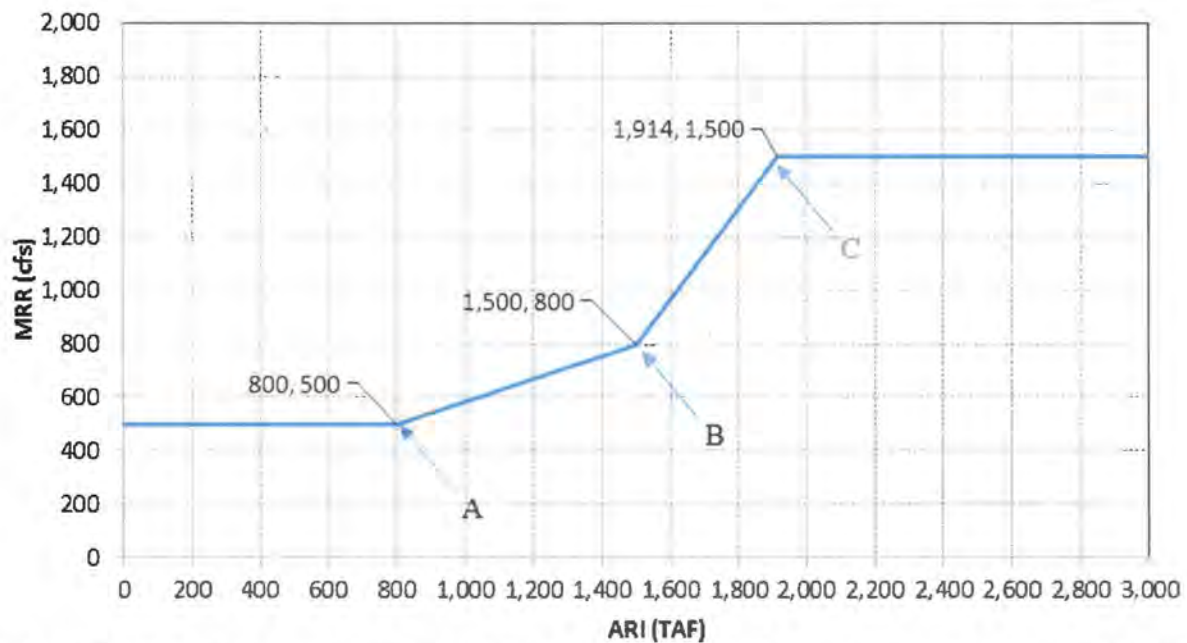


Figure 8. Relationship between the American River Index and monthly Minimum Release Requirements for October.

For October, the following equations can be used to determine the MRR for a given ARI:

- If $ARI \leq 800$ TAF, then $MRR = 500$ cfs
- If $800 \text{ TAF} < ARI \leq 1,500 \text{ TAF}$, then $MRR = 0.429 * ARI + 157$ cfs
- If $1,500 \text{ TAF} < ARI \leq 1,914 \text{ TAF}$, then $MRR = 1.690 * ARI - 1,736$ cfs
- If $ARI > 1,706$ TAF, then $MRR = 1,500$ cfs

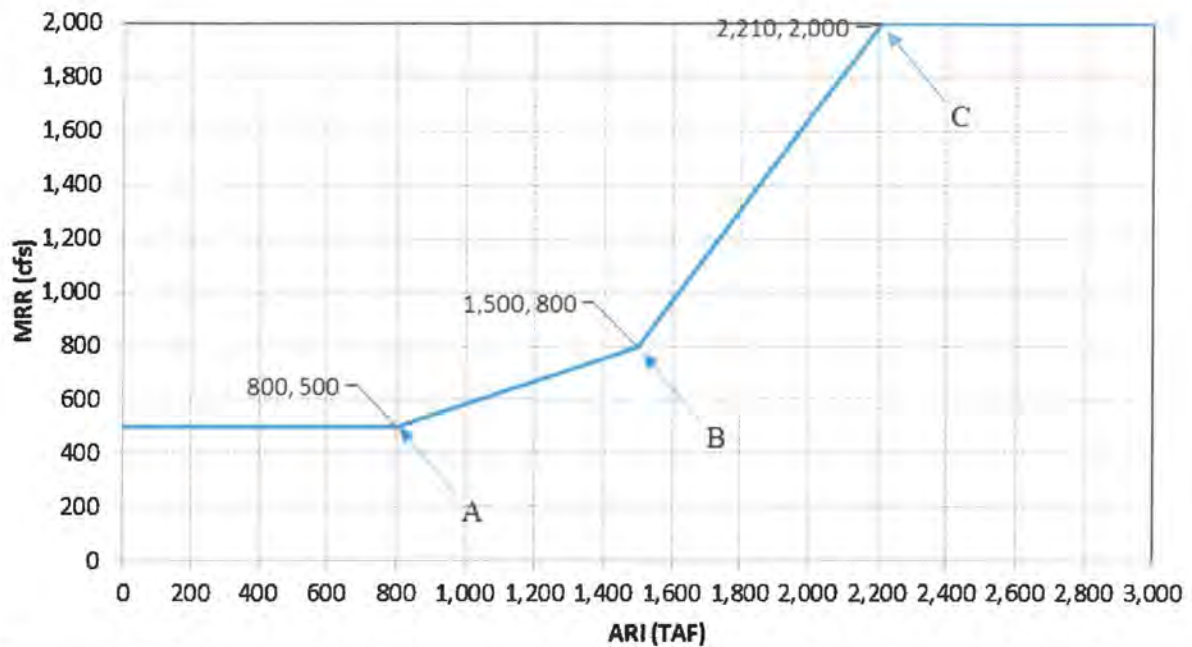


Figure 9. Relationship between the American River Index and monthly Minimum Release Requirements for November and December.

For November and December, the following equations can be used to determine the MRR for a given ARI:

- If $ARI \leq 800$ TAF, then $MRR = 500$ cfs
- If $800 \text{ TAF} < ARI \leq 1,500$ TAF, then $MRR = 0.429 * ARI + 157$ cfs
- If $1,500 \text{ TAF} < ARI \leq 2,210$ TAF, then $MRR = 1.690 * ARI - 1,736$ cfs
- If $ARI > 2,210$ TAF, then $MRR = 2,000$ cfs

Addendum F Tuolumne Proposal

Terms

- Proposed FERC relicensing flows as submitted on November 14, 2018 constitute the base flows.
- FERC flows modified from 75 cfs to 125 cfs in critical and dry water years and reduce FERC flows from 350 cfs to 300 cfs in wet , above normal and below normal years from June 1 to October 15.
- Flood plain pulse flows as follows:
 - 2,750 cfs for 20 days in W and AN WYs with decision on WY type in March using SJR Index 60-20-20 at 90% exceedance for floodplain pulse.
 - 2,750 cfs for 18 days in BN WYs with decision on WY type in March using SJR Index 60-20-20 at 90% exceedance for floodplain pulse.
 - 2,750 cfs for 14 days in D WYs with decision on WY type in March using SJR Index 60-20-20 at 90% exceedance for floodplain pulse.
 - 2,750 cfs for 9 days in C WYs with decision on WY type in March using the SJR Index 60-20-20 at 90% exceedance for floodplain pulse.
 - Dry and critical year off ramps.
- Predation barrier and counting weir to be designed in consultation with DFW and may be constructed with permanent concrete abutments and necessary appurtenances and will be a part of annual predator suppression activities.
- Develop initial feasibility studies within 2 years to develop additional supplies for river flows. Implementation is subject to mutual agreement of the parties.

Addendum G Friant Proposal

As part of a comprehensive approach to coordinated operations and implementing updates to the State Water Resources Control Board's Water Quality Control Plan objectives, for 15 years from the date of this agreement, the Secretary of Interior, pursuant to section 10004(a)(4)(C) of the San Joaquin River Settlement Act (P.L. 111-11), proposes to manage San Joaquin River Restoration Flows (Restoration Flows) that are otherwise capable of being recaptured and recirculated for the benefit of Friant Division Contractors under the San Joaquin River Restoration Settlement (SJRRS) and San Joaquin River permits 11885, 11886, 11887 and License 1986.

In all years, except for those determined to be Critical-High or Critical-Low under the SJRRS, Reclamation proposes to reduce the recapture of Restoration Flows to the extent necessary to achieve a goal of total Delta outflows derived from any San Joaquin River flows released below Friant Dam of 50,000 acre-feet during the period of February and May (Delta Outflow Goal), subject to the following:

1. Reclamation proposes to recapture, protect and manage Restoration Flows for the purpose of reducing or avoiding impacts to water deliveries to Friant Division long-term contractors caused by Restoration Flows except when, during the months of February through May, reducing recapture diversions as part of this agreement is necessary to satisfy the Delta Outflow Goal above.
2. The maximum amount of reduced recapture in any month during the period of February through May would be up to 50% of the total recapturable Restoration Flows for such month.
3. It is understood and allowed that in some years there would not be sufficient Restoration Flows to meet the Delta Outflow Goal. In such years, Reclamation would still reduce recapture of San Joaquin Restoration flows by 50% of the existing flows, but the Delta Outflow Goal would not be satisfied, and Reclamation would not be required to take other actions or make other releases of water.
4. Consistent with law, Reclamation would not reduce water supply to other CVP contractors in order to achieve the Delta Outflow Goal.
5. All flows released below Friant Dam, including those flows released and/or bypassed at Friant Dam necessary to address flood conditions, would contribute towards satisfying the 50,000 acre-foot Delta Outflow Goal.

The State Water Resources Control Board would agree that implementation of this agreement, in conjunction with continued implementation of the San Joaquin River Restoration Program, would be deemed sufficient to satisfy the Friant Division Contractors' contribution to implementation of the Water Quality Control Plan updates, as long as this provision remains in effect.

Addendum H Delta Proposal

Purpose:

The flow provided through D-1641, combined with the additional flow, structural habitat, and funds included herein, would be used to create substantial benefits to ecosystem functions and to create conditions necessary to improve the viability of native fish. The augmented outflow would be applied based on the governance described below and would be integrated with landscape and other changes to achieve ecological outcomes favorable to native fish and wildlife.

Proposed Commitments:

1. Flow

Reclamation and DWR, with the support of SWP Contractors and South of Delta CVP Contractors, commit 300 TAF of water from SWP Contractors and South of Delta CVP Contractors to annual outflow after April 1 of Above Normal, Below Normal, and Dry water year types.

In addition to the 300 TAF and the 440 TAF from the Agreement Framework, 300 TAF of additional water will be made available, subject to conditions below, through Prop 1 storage projects that generate environmental water; purchases of additional water through the Agreement Framework, other willing seller/buyer arrangements; future bond funding; and, if required, from SWP Contractors and South of Delta CVP Contractors. Environmental water provided through Prop 1 storage projects would be made available as these projects are constructed. If the science demonstrates a need, additional water to generate a total of 300 TAF will be made available in year 8 or beyond. This water would be used to test specific hypotheses for identified species or ecosystem needs, as agreed to through the new governance structure by a stakeholder group. The availability of this water is contingent upon the restructuring of the Delta science and monitoring program.

2. Habitat

The application of the 740-1,040TAF of water across seasons and water years would vary and would be based on direction from the stakeholder group, although would be primarily focused on above Normal, Below Normal, and Dry water year types. This flexibility would allow for real-time adjustments to hydrologic conditions (for example, to take advantage of pulse flows from storms), experimental flows to test ecological responses to landscape changes, and strategic use of flows to improve water quality. This also involves narrowly targeting flows to improve ecological conditions in specific areas, which increases the efficiency of the use of this water. Additionally, several projects are proposed to increase the land-water interaction in the Delta (described below). Freshwater flows, tidal flows, and landscapes would be managed together to stimulate ecosystem processes and functions to improve habitat conditions for fish. This increased flexibility in the timing and magnitude of freshwater flows and linkages to landscape modifications would increase habitat benefits and take advantage of tidal energy. For example,

flows in combination with structural habitat projects would be used to reverse declines in food resources for the Delta ecosystem, maximize high-quality habitat that favors native plants and animals, and manage nutrient pollution to reduce harmful algal blooms. Flow and non-flow habitat actions can also be influenced by existing and planned gates and barriers to further maximize the benefits of these resources. Clear hypotheses would be used to monitor, report and adjust both flow and non-flow actions to maximize the benefits of the water and funding made available to the Delta habitats. This approach has the best chance of improving our understanding of how to manage the Delta in the future.

Additionally, there are opportunities to provide substantial benefits in Cache Slough and some augmented Delta outflow through the use of water from the Solano project or other water available in Putah Creek. This can provide foodweb benefits in Cache Slough and the North Delta as well as provide a modest contribution to outflow for other ecological functions.

Delta habitat projects that may contribute to the above are included in Table 1.

Table 1. In Delta Habitat Actions

<ul style="list-style-type: none"> • North Delta Arc • Complete CWF tidal and channel margin restoration on Sacramento River, Steamboat Slough and Sutter Slough • Chipps Island restoration • Increased aquatic weed removal • Predator hot spot removal • North Delta food subsidies • Suisun Marsh food subsidies • Construct RVRs facility • Consolidate and screen intakes in Cache Slough • Funding for game wardens for enforcement/boats in Delta

3. Governance/Decision Making:

An organized, deliberate approach to integrating science into decision-making, and continually adjusting actions in response, is needed to reduce uncertainty and more effectively use the resources made available as part of this agreement (Figure 1).

This approach would define a set of initial projects throughout the Sacramento and San Joaquin River basins and the Delta that have high probability to provide benefits to improve Delta ecosystem functions and to create conditions necessary to improve the viability of native fish. (See Appendix 2 to Agreement Framework, Proposed Actions for Species Objectives: The Delta and American & Mokelumne Rivers).

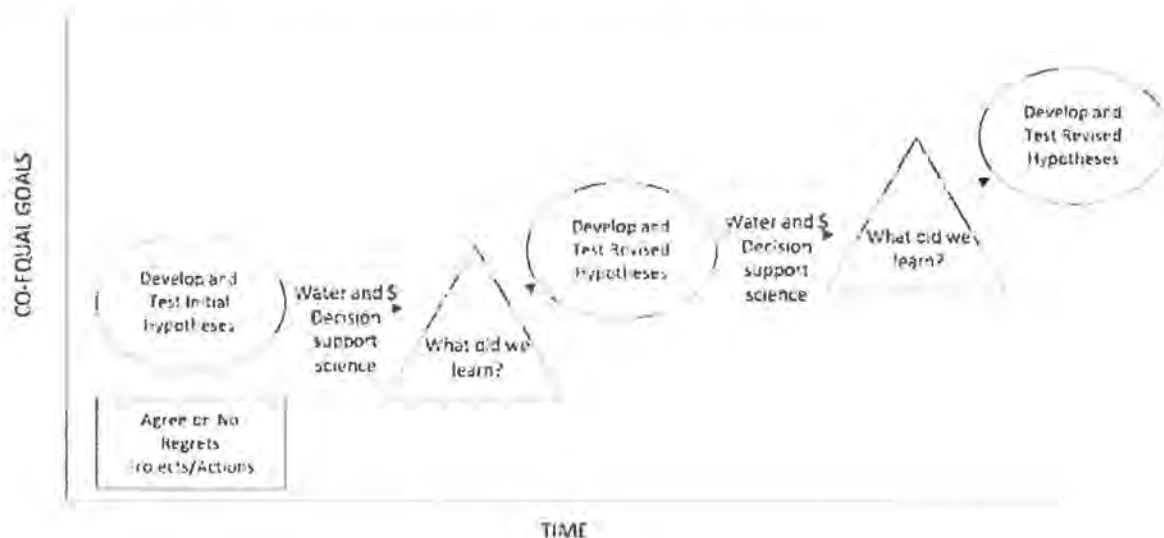
This approach would define a set of initial testable hypotheses that are used to test the integration of flow and habitat actions to provide identified, measurable benefits. It would also facilitate coordination among parties throughout the Delta ecosystem to better integrate habitat and species management activities.

This approach would define a program to answer management questions and support the investigation of the testable hypotheses. This would be accomplished by using existing funding that has been used for compliance monitoring and science program implementation and redirecting it; funding generated through this agreement, and other sources. The purpose of the program would be to accomplish the following:

- Implementing specific experiments – The Science Program would adopt a “safe to fail” experimental approach to maximize learning.
- Testing hypotheses – the program should identify and test key hypotheses, especially/even if conflicting, about how the system functions and what measures are most effective at achieving desired outcomes.
- Learning from the experiments – ensure each action undertaken is designed to gain as much knowledge as possible.
- Designing the experiments to be outcomes based – The VA Science Program would identify a manageable set of SMART objectives that describe desired environmental and biological outcomes.
- Facilitating a collaborative process – all stakeholders are engaged in the development and implementation of the science program.
- Facilitating a transparent process – through collaboration, reporting, and working towards open data.

This approach would establish a collaborative structured decision-making process to determine flow and structural habitat actions, direct science needs, and incorporate outcomes of the testable hypotheses to continue to inform decision-making.

Figure 1. Summary of proposed science and decision-making process



4. Funding Commitments:

Sacramento River Flow and Delta Outflow Augmentation Effort, With Fund: A fund will be developed to compensate farmers in the Sacramento River basin, Sacramento River, and Feather River who fallow land to contribute water for Delta outflow and tributary flows. The fund would be initially established with Prop 1 funds and subsequently funded through the collection of a surcharge on water diverted, as described below. Collection of the surcharge would begin immediately and would be collected for each of the 15 years of this agreement.

CVP and SWP contract water: Each acre-foot of CVP and SWP water diverted would be assessed a charge. Based on the last 10 years of diversions, this per acre foot charge could generate in excess of \$370M over the 15-year term. After the 5th call for water using this revenue, the Reclamation, DWR, SWP Contractors and South of Delta CVP Contractors would reconvene to determine if the surcharge needs to be adjusted to ensure the fund can support future calls for water.

Non-CVP and SWP contract water: Agencies who contribute water would not pay a charge on their non-CVP/SWP water diversions, but agencies who do not contribute water would pay \$10/acre-foot towards the revolving fund for water acquisition.

State and Federal contributions: The State and Federal governments commit to pursuing State bond money and seeking any necessary legislation to provide additional monetary funds. This includes potential directed and competitive funding opportunities from various State sources. Up to approximately \$1.3 billion in bond funding is available for instream flows, restoration, multi-benefit flood projects, and other activities.

Appendix 2: Locations and Scale of Habitat Measures

PROPOSED ACTIONS FOR SPECIES OBJECTIVES

Full Project Area



ADDITIONAL PROPOSED ACTIONS FOR SACRAMENTO RIVER

Gravel augmentation
New opening / rearing habitat restoration up to 50 acres
Flow measures will create 600-700 acres in the mainstem channel with project levees
Reduced lighting at Sacramento River bridges
Predator suppression and control
Inventory and reconnect historic inflows and other off-channel habitat within project levees

ADDITIONAL PROPOSED ACTIONS FOR KREATHREIVER

Fish Weir Program
Hatchery Improvement Program & RAMP Implementation
Creation & Improvement of Side Channel Habitat
Structural Habitat Program - CRP and Boulder Installations
Identification of Predation Hot Spots & Adaptive Management for Predator Reduction
Lower Feather River Habitat Improvement Program
Gravel Weir/Flood Plain Reduction Project
Restoration of Floodplain Habitat within Existing Detention Levees
Riparian Floodplain Program
Riparian Floodplain Program Second Project
Gravel Supplementation/Improvement Program, 10 projects within 10 years
Gravel Augmentation

ADDITIONAL PROPOSED ACTIONS FOR YUBA RIVER

Multi benefit projects to improve habitat including grading or lowering river bed, riparian planting, creating backwater off-channel areas and fish access improvement

ADDITIONAL PROPOSED ACTIONS FOR DELTA

Aquatic weed removal
Predator hot spot removal
Funding for game warden / enforcement

ADDITIONAL PROPOSED ACTIONS FOR AMERICAN RIVER

1. Paradise Beach [1] [2]
2. Howe Ave. [1] [2]
3. Howe to West [1] [2]
4. Williams Pond Outer [1] [2]
5. River Street [1] [2]
6. Upper River Bend [1] [2]
7. Arnold Hoffman [1] [2]
8. Sacramento Bar - North [1] [2]
9. El Monte [1] [2]
10. Sacramento Bar - South [1] [2]
11. Sunrise [1] [2]
12. Upper Sunrise [1] [2]
13. Lower Sunrise [1] [2]
14. Upper Sutter Bar [1] [2]
15. Alameda Basin [1] [2]

LEGEND

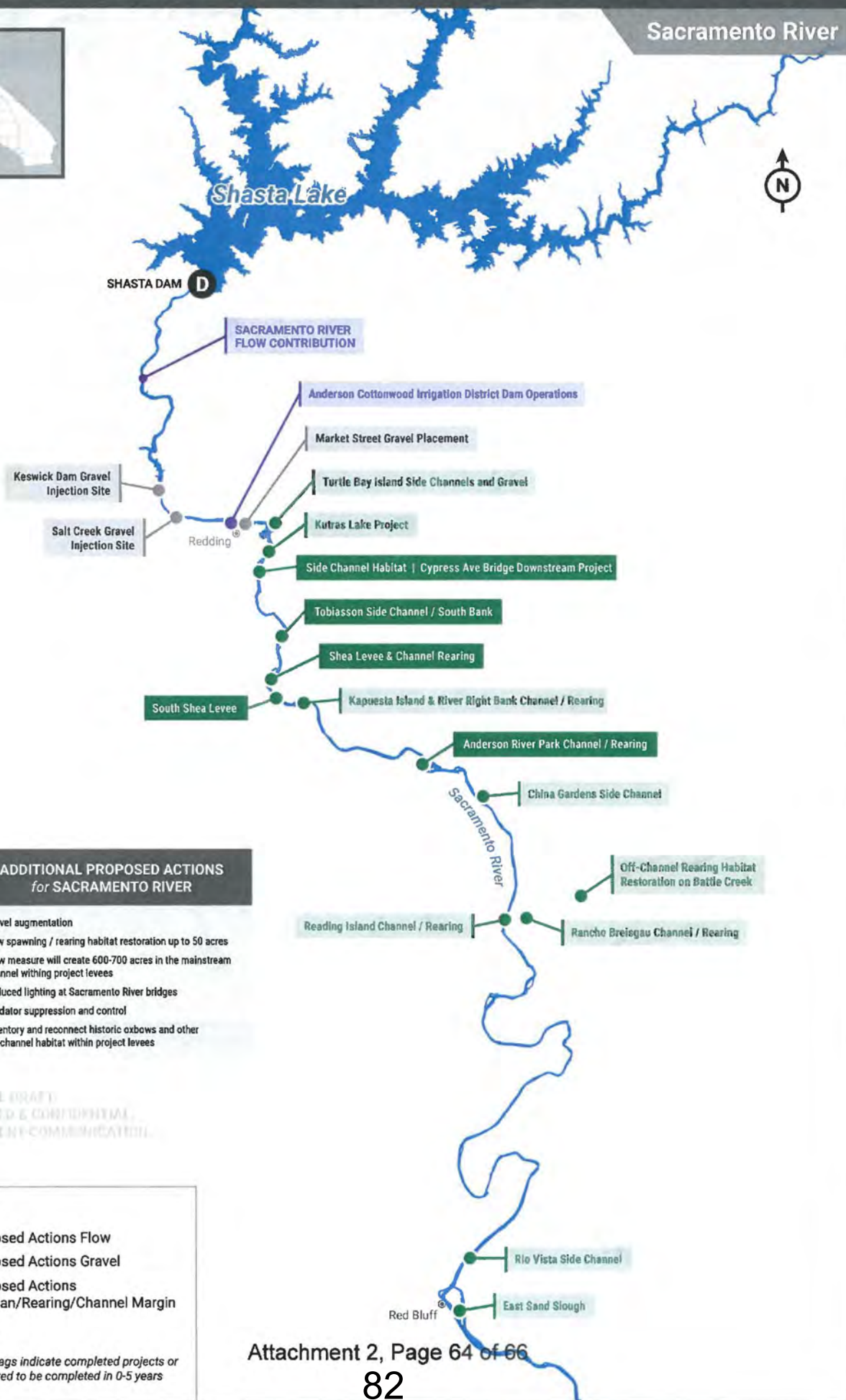
- Flow Objective Compliance Point
- Proposed Actions Flow
- Proposed Actions Riparian/Rearing/Channel Margin
- Proposed Actions Fish Screens
- Proposed Actions Fish Passage
- Proposed Actions Hatchery Improvement
- Proposed Actions Other
- FERC Project Boundary
- Area of Concentration of Proposed and FERC Actions
- Area of Concentration of Proposed Yuba River Actions
- North Delta Arc
- Complete EcoRestore Acres
- Suisun Marsh Boundary
- Legal Delta Boundary
- Dam

Solid color tags indicate completed projects or projects slated to be completed in 0-5 years

PROPOSED ACTIONS FOR SPECIES OBJECTIVES

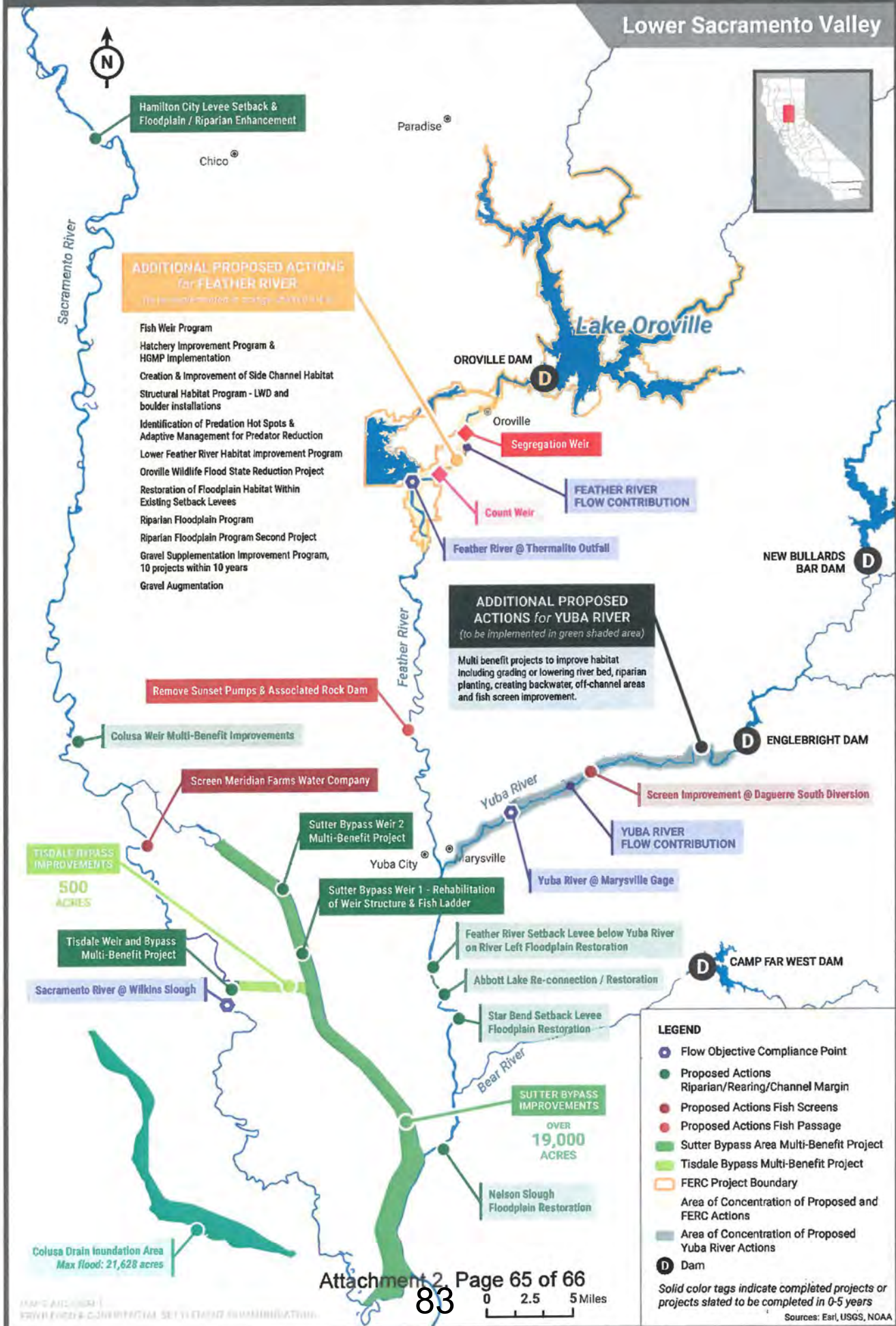


Sacramento River



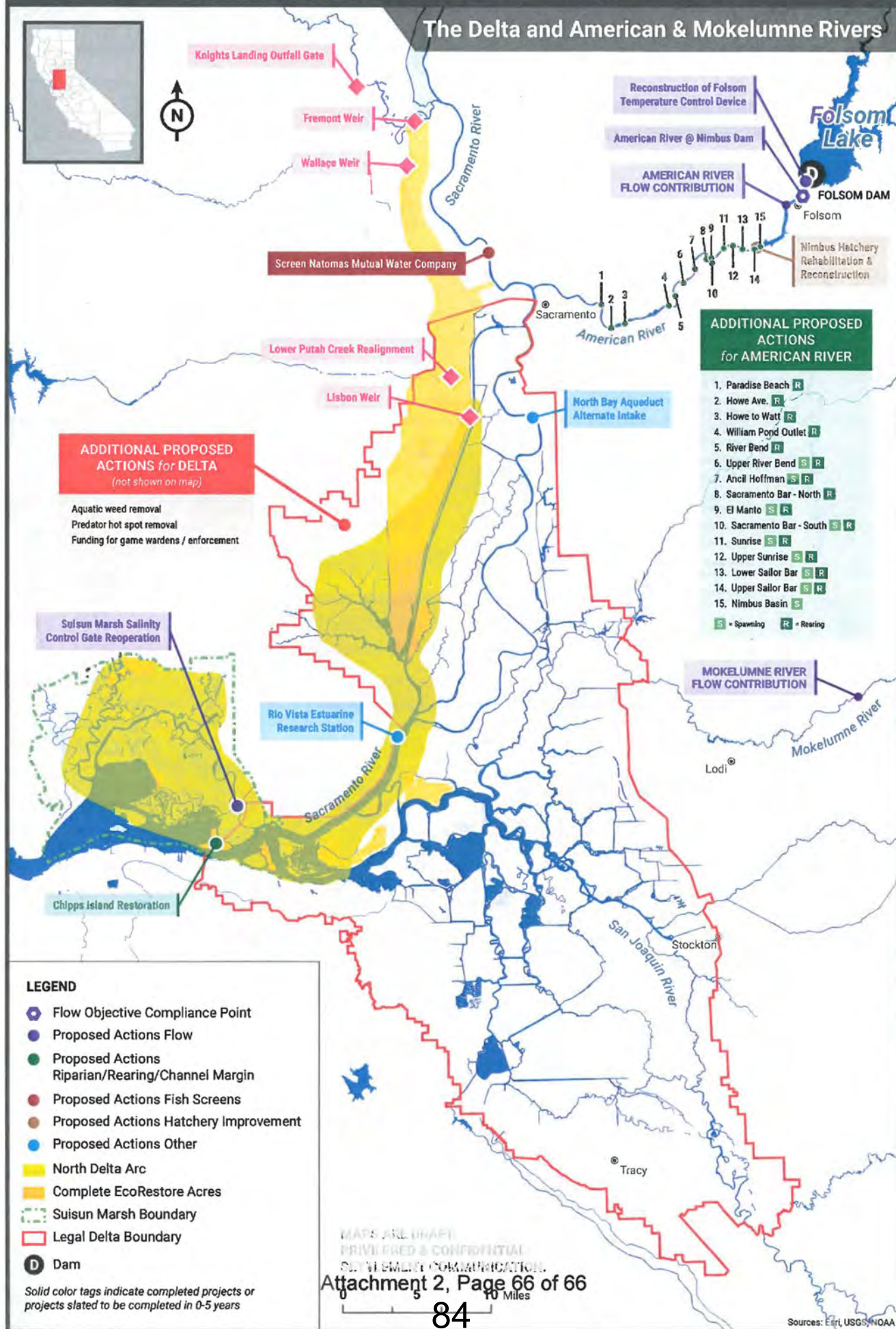
PROPOSED ACTIONS FOR SPECIES OBJECTIVES

Lower Sacramento Valley



PROPOSED ACTIONS FOR SPECIES OBJECTIVES

The Delta and American & Mokelumne Rivers



Summary of Proposed Voluntary Agreements
December 12, 2018 Public Draft

Overarching Concepts

- Covers a 15-year term.
- Covers the Sacramento and San Joaquin Rivers, Delta and major tributaries to each.
- Provides water and funding for habitat and science activities.
- Focuses on above normal, below normal and dry water year types.

Decision-Making Framework

- A collaborative program will be established based on a structured decision-making process to determine flow and structural actions and to direct science needs.

Funding

- Funding to be made available through water user contributions and state and federal dollars, totaling about \$1.7 billion over the term of the agreement
- Two revolving funds to be established. One for water acquisitions to compensate farmers in the Sacramento River basin who fallow land to contribute flow. A second to support structural habitat projects and science investigations.

Entity	Contribution to Water Purchase Revolving Fund	Contribution to Structural Habitat and Science Revolving Fund
State and Federal governments	Prop 1	Up to \$1.3 Billion
CVP/SWP water	\$5/acre-foot	\$2/acre-foot
Sacramento R Settlement Contractors and Feather R Diversion Agreement parties		\$1/acre-foot
Non CVP/SWP who contribute water		\$2/acre-foot
Non CVP/SWP who do not contribute water	\$10/acre-foot	\$2/acre-foot

- DWR to collect SWP surcharge through statement of charges, CVP method for collection of funds is as yet unspecified. Based on last 10-years of diversions, surcharge is expected to generate more than \$370 million over 15-year term.
- State and Federal governments commit to pursue bond money and legislation for additional funds. Up to about \$1.3 billion in bond funding is available for these activities
- Yuba Water Agency to contribute \$520,000 annually to the habitat and science fund and \$10 million for habitat enhancement measures in the Yuba watershed.

Water

- Provides 740-1,040 TAF of water, above that required in the existing Water Quality Control Plan.

Party	Contribution (TAF)	Source	Detail
Sacramento Watershed	300	Land fallowing (35,000 acres), reservoir reoperation, potential for limited groundwater substitution	<u>Sacramento</u> : 100TAF from land fallowing of about 24,000 acres to be compensation through water purchase revolving fund. <u>Feather</u> : 50TAF from land fallowing of 11,000 acres to be compensation through water purchase revolving fund. <u>Yuba</u> : 50TAF. The first 9TAF without compensation, the remaining 41TAF at \$290/AF <u>American</u> : 50TAF. 10TAF from groundwater in up to 6 critical and dry years for upfront payment of \$15 million; 10TAF from reservoir reoperation in above normal and below normal years for \$290/AF; up to 20TAF in up to 6 critical and dry years for \$40 million (if they are awarded bond funding for infrastructure projects)
San Joaquin Watershed	140	Reservoir reoperation, storage withdrawal, restoration flow recapture reduction	<u>Tuolumne River</u> : Critical and Dry year flows increased from 75 cfs to 125 cfs, wet, above normal and below normal reduced from 350 cfs to 300 cfs, pulse flows between 45-99 TAF depending on water year type. <u>San Joaquin River</u> : 50TAF
South of Delta	300-600	SWP and CVP water	None
Total	740-1,040		

- SWP/CVP exporters to initially commit 300TAF. No earlier than year 8 of the agreement, an additional 300TAF will be made available through prop 1 storage projects, purchase of additional water, other willing seller/buyer arrangements and/or future bond funding, contingent on the restructuring of the delta science and monitoring programs

Habitat Improvements

- Sacramento River: modification of flow timing, structural spawning and rearing habitat and fish passage improvements, pulse flows for migration and spawning gravel cleaning including a 30 TAF pulse flow in critical years, increased in-stream flows for outmigration and outflow, fish screen, reduced lighting and predation projects.
- Feather River: Reoperation of Feather R to create additional spawning and rearing habitat, adjustments to temperature management, gravel augmentation, barrier removal, floodplain restoration and improvements, and predation reduction projects.
- Yuba: Increased spring flows and up to 100 acres of floodplain and in-channel restoration.
- American River: 50 acres of spawning habitat, 150 acres rearing habitat, improvements to the Folsom temperature control infrastructure, and improvements to Nimbus hatchery.
- Tuolumne River: predation barrier and weir for predator suppression.
- San Joaquin River: San Joaquin River Restoration Program

- Delta: 740-1,040 TAF for outflow to be flexibly managed based on direction of stakeholder group, tidal and channel margin restoration, aquatic weed removal, predator hot spot removal, aquatic food subsidy projects, intake consolidation and screening in Cache Slough, and funding for game wardens in Delta.

Science and monitoring Program

- Proposes a comprehensive science and monitoring program that informs implementation of flow and non-flow measures and includes a structured decision-making process.

Other Terms

- State Water Board will have authority to enforce implementation of flow and non-flow measures but will not regulate funding arrangements.
- The framework does not bind any party to a definite course of action or limit any agency discretion.

Areas of potential concern for the District:

- An additional \$7/AF surcharge to be levied on all SWP and CVP water deliveries
- CVP method for collection of funds is as yet unspecified. Need to ensure M&I and Ag water contractors are treated equally.
- No earlier than year 8 of the agreement, an additional 300TAF will be made available through prop 1 storage projects, and other sources. Could be implications to Pacheco project.
- Implementation to be guided by a stakeholder group(s); however, it is not clear who the will be able to participate. It is unclear what role the District can have in implementation and future decisions.
- No conservation organizations have expressed support for the settlement agreement at this time.
- The Merced and Stanislaus Rivers do not have a proposed agreement.
- After completion of environmental reviews, any party may decide not to approve and go forward with the proposed project.

Statement from Chair Santos regarding the State Water Resources Control Board's proposal to increase water flows through the Sacramento-San Joaquin Delta for the environment.

We understand that the State Water Resources Control Board adopted their staff's proposed amendments to the Water Quality Control Plan. The board also directed their staff to assist in completing a Delta watershed-wide voluntary settlement agreement by March 2019 as an alternative to achieve a comprehensive Bay Delta Plan update that addresses the protection of beneficial uses across the Delta watershed. We remain optimistic that voluntary settlement agreements that provide a more holistic approach to ecosystem improvements can still be negotiated and adopted.

As an agency with a long-standing commitment to environmental stewardship, the Santa Clara Valley Water District understands the need to protect and improve the Delta ecosystem. Our considerable knowledge of the water supply and environmental issues of the Delta lead us to believe that flows alone would not enable the full benefits of the plan to be achieved, and that habitat restoration must be part of the picture.

Without a voluntary settlement agreement, the people and businesses of Santa Clara County will see significant water supply impacts. We will continue to work with our partners in securing the best possible outcome for Santa Clara County and the Delta.

**Mid-Pacific Region
Sacramento, Calif.**

MP-18-179

Media Contact: Erin Curtis, 916-978-5100, ecurtis@usbr.gov

For Immediate Release: Dec. 13, 2018

Statement by Bureau of Reclamation Commissioner Brenda Burman on California Water Agreements

I am very proud of the accomplishments we have made with the state and with our partners on the framework for voluntary agreements to address water flow issues in the Sacramento-San Joaquin River Basins. I am also extremely pleased that we were able to reach agreement with the state on an addendum to the Coordinated Operation Agreement that lays the groundwork for improved water management in California for the next generation.

Unfortunately, the State Water Resources Control Board chose to move forward with Phase I of its water quality control plan update. We have consistently opposed this approach. It appears the State Board has left room for future consideration of the voluntary agreements, and we are working to fully analyze the impact the State Board action has on our federal projects.

I am optimistic about the future, and we will continue to work with our partners at the California Department of Water Resources as well as the State Board and our stakeholders to advance reasonable water management solutions for our contractors that meet the needs of California's farms, families, industries and environmental resources.

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Reclamation is the largest wholesale water supplier in the United States, and the nation's second largest producer of hydroelectric power. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at <http://www.usbr.gov>. Follow us on Twitter [@USBR](https://twitter.com/USBR) and [@ReclamationCVP](https://twitter.com/ReclamationCVP).



MEMORANDUM

FC 14 (01-02-07)

TO: Board of Directors

FROM: Nina Hawk

SUBJECT: Public Scoping Meeting for Shasta Dam Raise

DATE: December 17, 2018

On November 30, 2018, Westlands Water District (Westlands) issued a Notice of Preparation (NOP) to develop an Environmental Impact Report (EIR) for the Shasta Dam Raise Project (Project), initiating a 30-day public comment period. The NOP can be found here: <https://www.wwd.ca.gov/wp-content/uploads/2018/11/shasta-dam-raise-eir-nop-scoping-checklist.pdf>. Written comments are due by January 4, 2019.

Westlands, as the Lead Agency under the California Environmental Quality Act, hosted an open house and public scoping meeting on December 12, 2018 to provide the public with information on the Project (Attachment 1). According to an article in the *Redding Record Searchlight*, Westlands was faced with mostly negative comments from the public during the meeting (Attachment 2).

Nina Hawk
Chief Operating Officer
Water Utility Enterprise

Attachment 1: Public Scoping Meeting Notice

Attachment 2: Redding Record Searchlight Article, "Westlands blasted over role in raising Shasta Dam," 12/13/18.



Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX: (559) 241-6277

Public Scoping Meeting to Be Held for Shasta Dam Raise Project

Redding, Calif. – Westlands Water District (District) is preparing an environmental impact report (EIR) under the California Environmental Quality Act (CEQA) for the Shasta Dam Raise Project (Project). Formerly known as the Shasta Lake Water Resources Investigation (SLWRI), the Project would increase the height of Shasta Dam by 18.5 feet and expand capacity of Shasta Lake by up to 634,000 acre feet.

Consistent with CEQA, the District issued a Notice of Preparation to develop the EIR on November 30, 2018, initiating a 30-day public comment (PRC §21091). To review a copy of the Notice of Preparation, visit <https://wwd.ca.gov/>. The District is asking for comments from Federal, Tribal, State, and local governments; special interest groups; and the public to help identify issues and concerns associated with the potential effects of implementing the Project. Written comments are due on or before 11:59 p.m., Friday, January 4, 2019.

The District is hosting an open house and public scoping meeting to provide the public with information on the Project and receive written scoping comments. The meeting will be held on:

- Wednesday, December 12, 2018, 5:00 – 7:00 PM – Hilltop Holiday Inn, Palomino Room, 1900 Hilltop Drive

The open house portion of the meeting will be from 5:00 – 5:30 pm. A presentation from Westlands regarding the Project and EIR will begin at 5:30 pm. Following the presentation, the open house will then resume until 7:00 PM.

Written comments can be submitted via the following methods:

- *U.S. mail (postmarked by Jan. 4, 2019) or hand-delivery:*

Shasta Dam Raise Project
c/o: Stantec
3301 C Street, Suite 1900
Sacramento, CA 95816

- *Email: shastadameir@stantec.com*

The SLWRI was led by the Mid-Pacific Region of the Bureau of Reclamation and assessed a range of water supply and environmental improvements that could be realized through changes at Shasta Dam. These studies were conducted pursuant to the National Environmental Policy Act, which culminated in transmittal of the SLWRI Final Feasibility Report and Environmental Impact Statement to Congress in July 2015.

Shasta Dam Raise Project Scoping Meeting Notice
November 30, 2018
Page 2

For more information on SDRP visit <https://wwd.ca.gov/>

For more information on SLWRI visit: <https://www.usbr.gov/mp/ncao/shasta-lake.html>

NEWS > AGRICULTURE

Westlands blasted over role in raising Shasta Dam

By **DAMON ARTHUR** | Redding Record Searchlight

PUBLISHED: December 13, 2018 at 5:19 pm | UPDATED: December 13, 2018 at 5:20 pm

REDDING — A water district that provides irrigation to San Joaquin Valley farmers heard mostly negative comments in Redding on Wednesday about its role in the ongoing proposal to raise the height of Shasta Dam.

The Fresno County-based Westlands Water District, which has stepped forward to help pay the cost to raise the dam, held a meeting at the Holiday Inn to take comments that will be used to develop an environmental impact report on the project.

The purpose of the project is to ensure survival of salmon living downstream of the dam and to stabilize the supply of water in Lake Shasta and downstream of the dam, said Mary Paasch, vice president of Stantec, the consultant hired to write an environmental impact report on the project.

But most of those who spoke about the project Wednesday felt Westlands, long a controversial player in state water politics, has ulterior motives for wanting to build the project

"Does anybody really think that is accurate or descriptive for the purposes of the project?" said Dan Frost of Redding. "The purpose of the project is to send more water, at an enormous cost, down to that perpetual bottomless pit, the Westlands Water District, which has an insatiable appetite for water and public funds."

The U.S. Bureau of Reclamation has for many years considered raising the height of the dam, and in 2015 completed a federal environmental analysis of raising the dam 18½ feet.

The \$1.4 billion project was shelved at the time because the bureau wanted local and state agencies to help pay the cost. This spring, however, Congress set aside \$20 million for design and pre-construction work on the project.

Plans for raising the dam have been drawn up and crews were out this past summer boring holes in the dam, testing the concrete to see if it was strong enough to hold the weight of a taller dam.

The bureau expects to award the first construction bid for the project in December 2019, which is also when the consultant expects to complete the environmental impact report.

The bureau has said it will pay half the cost of the project, but local and state partners will have to pay the other half of the cost.

So far, Westlands is the only other agency to offer help pay for the project, said Craig Moyle, a spokesman for Stantec.

California Secretary of Natural Resources John Laird sent a letter to leaders in Congress earlier this year asking them to consider other water projects because raising Shasta would further inundating the McCloud River, which is protected under state law.

Moyle said even though a federal environmental analysis has already been completed, Westlands needs to do another study to satisfy state law because the water district is not a federal agency.

John McManus, executive director of the Golden Gate Salmon Association, said one federal government agency said the project wouldn't benefit salmon in the Sacramento River downstream of the dam.

The U.S. Fish and Wildlife Service submitted comments on the 2015 federal environmental analysis, stating the dam raise would not benefit salmon.

McManus said the wildlife service pointed out that raising the height of the dam would result in fewer large releases from the dam in heavy rain years because more water would be stored behind the dam. The salmon need periodic heavy releases to create side channels in the river that are used by young salmon as safe habitat, McManus said.

And the salmon need the higher flows in the spring, rather than summer, he said.

How the dam might affect salmon wasn't the only topic discussed, though.

Matt Doyle, general manager of Lake Shasta Caverns, said he wanted the environmental impact report to take into account the positive benefits a higher dam would have on North State tourism.

Caleen Sisk, chief of the Winnemen Wintu Tribe, said that she was against a higher dam because a higher lake level caused by the higher dam would inundate more of their sacred sites along the McCloud Arm of the lake.

The Winnemem once lived on the McCloud River, but were moved out of the area after Shasta Dam was built in the early 1940s.

Sisk said the Winnemem's identity is wrapped up in the river, and raising the lake level would harm their cultural sites.

Tags: [Water](#)



Damon Arthur



MEMORANDUM

FC 14 (01-02-07)

TO: Melanie Richardson, COO

FROM: Sue Tippetts, DOO

SUBJECT: Los Gatos Creek Invasive Species

DATE: December 18, 2018

Recently, the District had become aware of an infestation of an invasive species *Ludwigia hexapetala* or Uruguay water-primrose in Los Gatos Creek in the vicinity of Vasona reservoir (see attached photo labeled BEFORE). This is the first known appearance of this aggressive invasive in Santa Clara County. The Uruguay water-primrose forms dense mats in waterways, reaching above and below the water surface. This dense growth impedes water movement, blocks the growth of native plants, and reduces available habitat for waterbirds and fish. Although this species has been naturalized in California for at least 25 years, it has grown exponentially in the past several years, leading to increased concern over its impacts on waterways. While the Uruguay water-primrose was likely introduced to the reservoir by boats or waterfowl, pieces of the mats can catch on boat and other watercraft that then spread plants to new areas. This infestation was surrounding the boat docks in Vasona Reservoir and had spread to Los Gatos Creek upstream and downstream of the reservoir. Staff obtained permission to conduct removal work on County Park land on the creek upstream of the reservoir.

This species is not on the list of invasive species covered under the SMP; however, staff made a request to the resource agencies to allow for the removal under the Stream Maintenance Program. Agency approval was received November 14. Staff began removal efforts on November 19 before winter storms dispersed it throughout Los Gatos Creek and Guadalupe River. An aquatic weed harvester was used for a total of 10 days removing the Uruguay water-primrose in the reservoir. Hand removal efforts occurred for 18 days in Los Gatos Creek itself and throughout the reservoir (see attached photo labeled DURING) and thus far approximately 6.95 acres of Uruguay water-primrose have been removed (see attached photo labeled AFTER). The cost for this initial removal work, to date, is a little over \$141,000. Follow up treatment will be necessary for 3 to 5 years to eradicate the species.

Sue Tippetts
Deputy Operating Officer
Watersheds Operations and Maintenance

Attachments: 1. Before, 2. During, 3. After

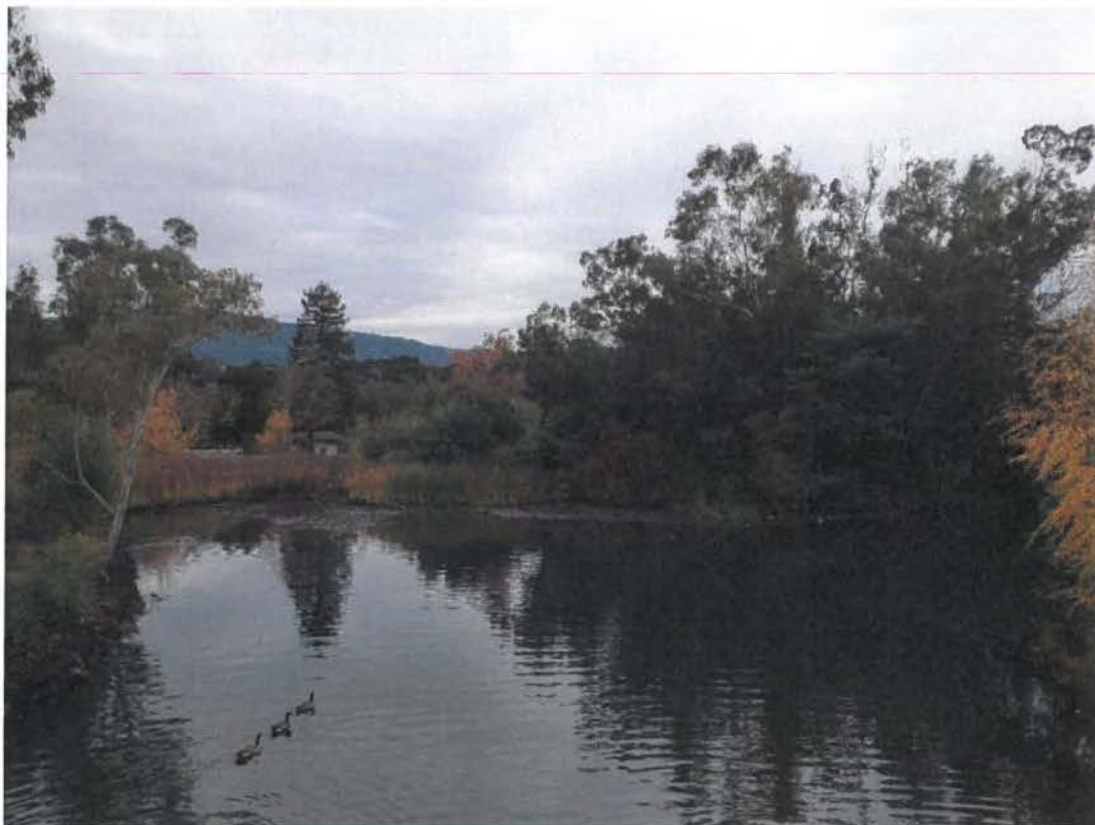
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Attachment 1:
BEFORE



Attachment 2:
DURING





MEMORANDUM

FC 14 (01-02-07)

TO: Board of Directors

FROM: Michele L. King, CMC
Clerk/Board of Directors

SUBJECT: Additional handouts from the December 17,
2018 Special Board Meeting

DATE: 12/19/18

Two handouts were received by members of the public during the December 17, 2018 Board Meeting, and are attached for the Board's review.

Attachment 1: Agenda Item 6 - Update on Sunnyvale East/West Channel FPP
Article titled "Basking Western Pond Turtle Response to Recreational Trail Use in Urban California" submitted by Kira Od.

Attachment 2: Agenda Item 7 - Update on the South San Francisco Bay Shoreline Project
Diagrams, comments and copies of communications submitted by Dean Stanford.

Basking Western Pond Turtle Response to Recreational Trail Use in Urban California

PAUL E. NYHOF* AND LYNNE TRULIO

San José State University, Department of Environmental Studies,
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*Corresponding author

ABSTRACT. – The presence of human activity near freshwater turtle habitat can have a negative impact on a range of turtle behaviors. We assessed whether human use of a recreational trail had an effect on basking behavior of western pond turtles (*Actinemys marmorata*) by observing individuals basking while we monitored recreational disturbances. Based on our results, we suggest limiting the number or times of operation of motor vehicle traffic adjacent to western pond turtle habitat to restrict impacts on basking behavior.

Recreational opportunities in the San Francisco Bay area, California, are widespread and diverse including activities such as hiking, biking, fishing, and boating. These activities may have significant negative effects on populations of western pond turtles (*Actinemys marmorata*). Moore and Seigel (2006) found that fishing, boating, and jet ski activity caused yellow-blotched map turtles (*Graptemys flavimaculata*) to abandon nesting and basking activity, often for the duration of the day. Similarly, Selman et al. (2013) found that frequent human disturbance can decrease turtle basking duration.

Behavioral disruption of basking can lead to a variety of harmful consequences for freshwater turtles. Basking is an essential behavior for freshwater turtle species because it allows individuals to elevate their body temperatures, thus increasing metabolism, ensuring proper digestion, and allowing turtles to operate more effectively in feeding, reproduction, growth, and predator avoidance (Schwarzkopf and Brooks 1985; Bodie 2001; Edwards and Blouin-Demers 2007). *Actinemys marmorata* is the only remaining native freshwater turtle in California and is listed as a California Species of Special Concern (California Department of Fish and Wildlife 2015). As the human population grows within the state, human activity encroaches upon western pond turtle habitat. A remnant *A. marmorata* population exists in a greatly altered water channel near Moffett Naval Air Station in northern California. The canal occurs alongside a recently opened section of the San Francisco Bay Trail, which exposes turtles to high rates of human activity through recreational

trail use. *Actinemys marmorata* is a wary species while basking (Bury et al. 2012). Wariness may increase the disturbance potential for basking individuals and may lead to a decreased ability to thermoregulate. Recent research suggests that *A. marmorata* is less likely to bask in areas of high human disturbance than a common nonnative competitor, the red-eared slider (*Trachemys scripta elegans*), which could limit quality basking sites (Selman et al. 2013). Other research suggests that recreational human activities can decrease basking durations of other turtle species (Moore and Seigel 2006; Selman et al. 2013). The goal of our research was to assess whether human recreational trail use had an effect on western pond turtle basking behavior along a 3.2-km section of the San Francisco Bay Trail.

Moffett Federal Airfield is located at the south end of the San Francisco Bay in Mountain View in Santa Clara County, California (lat 37°25'N, long 122°02'W). Here, turtles occur in channels adjacent to active trails located atop levees (Fig. 1). These channels are bordered on each side by steep slopes with a uniform width of 12 m and an average depth of 2.5 m. The basking substrate consists of muddy banks, tule (*Schoenoplectus acutus*) clumps, and occasional large woody debris. Water temperatures during the study ranged from 18°C to 21°C with a mean of 19.3°C (SD ± 1.03). The section of the Bay Trail we examined was first opened to recreational traffic in September of 2010, 9 mo before we collected data. The start of the observations coincided with the first basking season during which this population of turtles was exposed to recreational human activity in 2011. Vehicular traffic on the levee consisted primarily of infrequent trips by heavy-duty pickup trucks transporting equipment and materials for routine maintenance along the levee system. After trail opening, the level of vehicular traffic is likely to have been similar to pretrail opening, while recreational human activity has almost certainly increased as more people discover this area. Trail users were typically between 3 and 30 m from turtles along the trail.

From June through August 2011, we collected observational data on turtle response rates to various types of recreational activity and recorded basking durations. We observed turtles at 3 locations known to be well-used basking sites based on previous studies (C. Alderete, pers. comm., March 2011). We were concealed behind surrounding vegetation and natural barriers while observing both human activity and turtle behavior using binoculars and spotting scopes (Moore and Seigel 2006). Our distance to basking turtles was approximately 20–30 m. Data on human activity included type of recreational activity (categorized as walker, runner, bicyclist, or motor vehicle), number of people, and general noise level. Observations of turtle behavior included number of turtles, basking duration, initial and submergence behaviors, location, and whether submergence appeared to be associated with human activity or not.



Figure 1. Western pond turtle (*Actinemys marmorata*) habitat at the study site along the San Francisco Bay Trail in Mountain View, California (photographs by P. Nyhof).

We analyzed the data using SYSTAT® 13. The total rate of recreational activity along the Bay Trail and rates for each category of recreational activity were calculated by dividing the number of human activity events by the total observation time. Pearson chi-square (χ^2) tests were used to compare the disturbance rates for each category of recreational activity. The mean basking duration (in minutes) of disturbed turtles was compared with the mean basking duration when no recreationists were present. Because the data did not meet assumptions for parametric tests, we used the Mann-Whitney U-test to compare means.

We observed for a total of 68.5 hrs, with 1238 total human activity events recorded, 346 of which involved basking turtles. We observed 52 individuals basking during June ($n = 7$), July ($n = 24$), and August ($n = 21$). Basking was rarely interrupted by human activity, as only 25 of 346 (7%) possible events ended with turtles abandoning their basking site. However, the rate at which turtles abandoned basking differed by type of human activity ($\chi^2 = 52.88$, $df = 3$, $p < 0.0001$, $n = 346$). Turtles abandoned their basking sites at rates of 2%, 5%, and 6% in response to runners, walkers, and bicyclists, respectively (Table 1). However, turtles abandoned basking sites 45% of the time when a motor vehicle passed by on the trail.

The average turtle basking duration of 22 individuals that submerged naturally was 42.8 ± 5.0 SD/min. We recorded 30 individuals that submerged in apparent response to trail use, with an average basking duration

of 16.5 ± 2.8 SD/min for each event. Natural basking duration was significantly longer than disturbed basking times ($U = 542.5$, $df = 1$, $p < 0.0001$, $n = 52$), with natural basking being 2.5 times longer than disturbed basking. The 22 natural submergence events were representative of the 30 disturbed submergence events in that they took place in similar temperatures, times of day, and locations.

Most human activity along the trail was pedestrian traffic (bicyclists, runners, and walkers). Vehicular traffic was largely due to heavy-duty pickup trucks traveling along the levee system, which merges with the Bay Trail in several areas. The overall rate of human activity recorded in this study (18 events/hr) was much lower than observed in other recreational studies involving San Francisco Bay Area Trails, one of which reported 68 human recreational events per hour while observing shorebirds (Trulio and Sokale 2008). Our study site was in a newly opened section of the Bay Trail and, as it becomes more widely recognized, human activity levels could increase.

Overall rates of disturbance were low, which suggests that current human traffic along the trail may only have a limited impact on turtle basking behavior. However, analysis of disturbance types showed western pond turtles were much more likely to respond to motor vehicles than to any other type of disturbance. Motorized vehicles may be especially disruptive to turtles. For example, Moore and Seigel (2006) observed that *G. flavimaculata* frequently abandoned basking behavior due to recreational boat traffic, and Selman et al. (2013) found that boat traffic negatively impacts basking duration for the same species. Intense response to loud and fast-moving vehicles is well documented in bird species, especially when vehicles are approaching animals (Rodgers and Schwikert 2002, 2003; McGowan and Simons 2006). We observed turtles only during the summer months and thus lack data for other seasons. Also, human recreational activity may change throughout the seasons and is likely to increase over time as this section of trail becomes more widely known. The vehicular traffic, on the other hand, remains

Table 1. Type, number, and frequency of human activity events that caused turtles to abandon basking at the Moffett Federal Airfield, California, from June through August 2011.

Type	Individuals disturbed	Total no. of individual	Disturbance frequency (%)
Runner	2	99	2
Walker	4	84	5
Bicyclist	9	141	6
Vehicle	10	22	45
Total	25	326	7

rather steady throughout the year (Santa Clara Valley Water District, *pers. comm.*, April 2011).

Our observations indicate that basking periods interrupted by human disturbance are significantly shorter than undisturbed basking periods. Disturbances of this nature reduce time for thermoregulation and loss of heat energy, which could have profound effects on a turtle's ability to survive and reproduce (Crawford et al. 1983; Edwards and Blouin-Demers 2007). There are some benefits that could be gleaned from habitat alteration, as Lambert et al. (2013) concluded that basking sites shielded from human activity may lead to higher-quality basking potential, especially for native freshwater turtles. Thus, we recommend 1) limiting vehicular traffic near important *A. marmorata* basking habitat whenever possible, 2) encouraging drivers of required service vehicles to avoid driving near basking habitat during peak basking times, and 3) investigating installation of high vegetation and other ways to conceal turtles from trail use, especially by vehicles.

Acknowledgments. — We thank Moffett Federal Airfield and the Santa Clara Valley Water District for allowing us access to the study site. This study was conducted under a permit from the California Department of Fish and Wildlife (no. SC-11825) and the US Fish and Wildlife Service (no. 81640-2011-033). We also thank C. Alderete (Integrated Science Solutions, Inc.) for his information on turtles at Moffett Federal Airfield and for providing field support. This study was conducted with the approval of the Institutional Animal Care and Use Committee and with a grant from the David J. Powers Scholarship in the Department of Environmental Studies, both at San José State University.

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Conservation Research Needs of Easter Island (*Rapa Nui*) Marine Turtles

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MARCELO FUENTES-HURTADO¹

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ABSTRACT. — Easter Island has experienced a marked increase in tourism during the past few decades; this has intensified the use of natural resources, which has in turn posed new threats to marine wildlife. To gather

South Bay Restoration Plan Excerpts



Figure 3.7-5. Existing Project Area Recreational Trails System

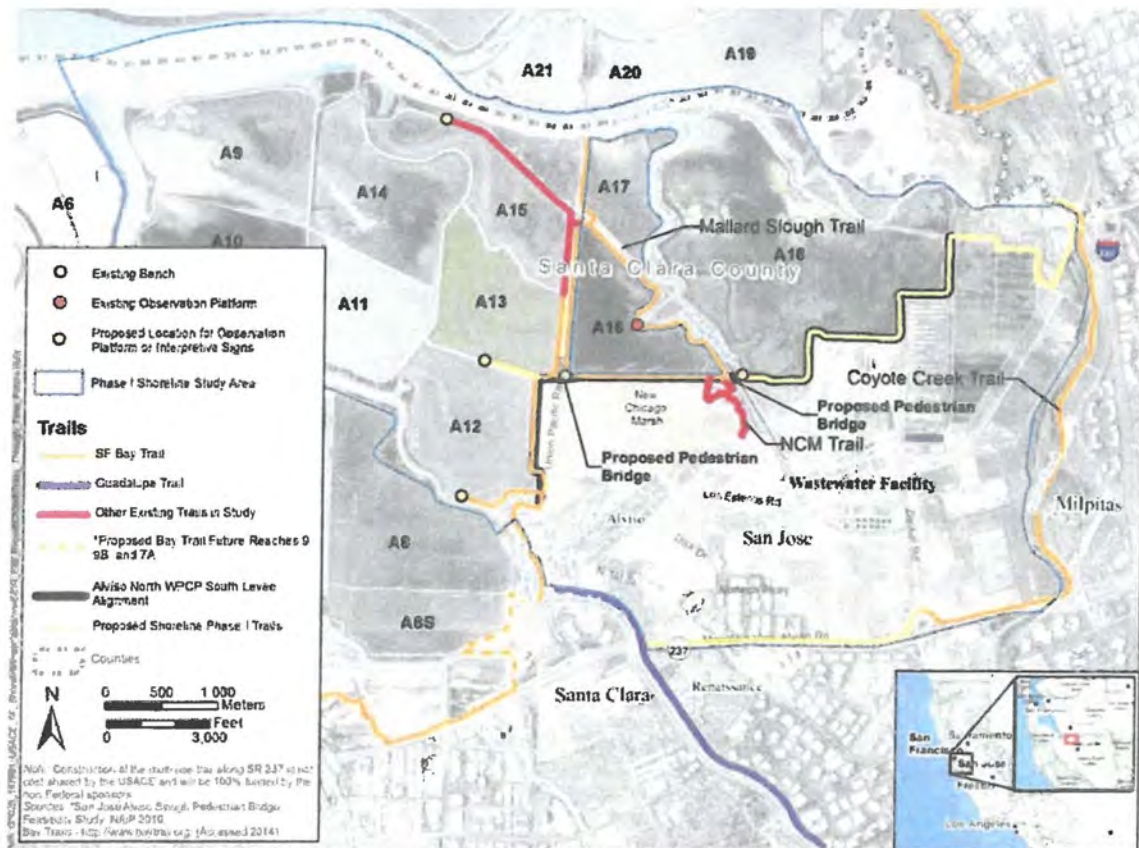


Figure 3.7-6. Future Project Area Recreational Trails System

BCDC Commission meeting June 21-2018 comments

Comments:

California State Parks is interested in facilitating and providing funding for a zero-emission recreation demo and multi-use park at the San Jose/Santa Clara water treatment plant. The park would include a nature center, five separate habitat kiosks and viewing areas, miles of paved walking and biking trails, an E-bike and BMX park next to planned development and a managed E-bike and mountain bike trail system.

The park would restore hundreds of acres reclaimed from treatment plant operations that are currently sludge drying ponds. Park staff would provide habitat and species stewardship. The park could include a loop trail on the levee around pond A18. (edit: pond A18 is not part of the Don Edwards Nature Preserve)

This park concept has interest from Santa Clara, CA State Parks, CARB and National Parks among others, and support from Assemblymember Kansen Chu and Supervisor Dave Cortese. (edit: Congressman Ro Khanna has been made aware of the project and is in favor) With the passage of Prop 68, CARB greening and other grants, hundreds of millions of dollars of funding is available.

Two important goals of the OHMVR Division of California State Parks in their strategic plan is to promote zero emission vehicles and open urban parks to reduce emissions system-wide. CARB also see this concept as a way to promote zero emission vehicles and offset pollution from gas burning 2-stroke vehicles.

A goal of the South Bay restoration project was to maintain recreation, but we are losing unprecedented access to nature and wildlife with the 9-mile loop trail out on the bay. Mitigating it with a paved trail along highway 237 and the zig-zag levee trail past garbage dumps and the sewage plant does not come close to equaling what was lost. (edit: the zig-zag trail and highway bike trail were part of existing plans regardless. This plan does not actually add trails to the existing overall area plans)

As mitigation for the lost trail a new park trail loop around pond A18 should be allowed while breaching and bridging the existing levee. Mitigation for allowing a new pond A18 loop trail could be satisfied by the park being responsible for creating more water bird nesting islands in pond A18 and providing the species and habitat stewardship staff and funding for the pond in perpetuity.

The pond trail would be an important aspect of the park to get families and the elderly/disabled out into nature and on the bay with docent or self-guided tours. Having the loop trail as part of an official park will allow for controlled use such as seasonal closures and park staff for law enforcement and environmental stewardship.

Recreation is the third most important goal of the project but is lacking in the plan. Where were the stakeholders for this aspect of the plan? Recreation is mentioned hundreds of times in the plan and increasing recreation is part of almost all the stakeholder's general plans. Why were there no city or county or state or even national park agencies as stakeholders? The recreation additions in the project are a couple of benches and a few miles of unattractive trails while losing the loop trail.

The plan does not retain the level of existing recreation and what replaces it is inadequate. This plan is unbalanced without any recreation stakeholders and needs more recreation to be balanced. The plan had no stakeholders representing recreation and inadequate public input. The Lead Agency should prepare a supplement to the EIR with the changed situation of potentially having a new loop trail on pond A18 as per CEQA Guidelines §15163.

Public outreach and input was inadequate with only 4 private citizens commenting on the plan as shown in Appendix I, Table I.1. I personally never heard about any public input opportunities. The notices were only posted on obscure websites. The park I mentioned has a petition which garnered over 500 local signatures and hundreds of positive comments in under 30 days.

California State Parks would entertain stakeholder status. The Chief and Deputy Director of the Division have offered to meet with any local officials.

Prop 68 or other funding should be explored for smoothing out the zig-zag levee to be more natural. All the adjacent levees fit in with nature, the zig-zag has a painfully man-made appearance.

Trail connectivity is hailed in the project plan while at the same time, discouraging commuting with bikes on the levee by not paving is stated in the plan and reducing the potential numbers of people who might use the Refuge trails to connect between the existing Coyote Creek section of the Bay Trail and Sunnyvale is stated as a beneficial impact.

Connecting commuting routes should be a priority to get more people out exercising and out of their cars. To encourage commuting by E-bikes, a separate trail on the inland side of the levees should be included. Create a terraced levee with the separate inland, down slope trail reserved for E-bikes and other zero emission personal transportation that would normally cause conflicts with hikers and bicycles. The down-slope location of the "commute" trail will be visually screened from refuge visitors and wildlife. The more people not commuting by fossil fuel burning cars the better for the refuge, sea rise and all of us and should be encouraged, not impeded.

As stated in the plan; Under the McAteer-Petris Act, the BCDC requires locations for water-oriented land uses and increased public access to shoreline and waters and encourages the provision of maximum feasible public access to the bay and its shoreline, The San Francisco Bay Plan contains policies that encourage the development of waterfront recreation facilities and linkages between existing shoreline parks and requires the provision of these opportunities in relationship to sensitive biological species, habitats, and future restoration of managed ponds. The BCDC amended the Plan in August 2005. The amendment focuses on the significance of the need to maximize public access and recreational opportunities along with the environmental aspect. The amendment failed to meet that goal.

Questions:

Does the project have jurisdiction over pond A18 and the levee around it? Would the treatment plant authority be able to open a loop trail around their pond as part of a multi-use park if desired?

Is Phase I and specifically any work on the A18 levee delayed by federal funding?

What is the official procedure to amend the project plan? Who can initiate a supplemental EIR? Would any action by Congress be able to save the pond A18 levee from destruction?

References from plan:

The purpose of the Shoreline Study is to decrease flood risk, restore tidal marsh habitat, and maintain recreational opportunities.

The lead agencies have designed the new proposed levee-top routes (maintenance roads that could be used as trails) to remain gravel. Leaving this trail unpaved would promote its use for educational tours and bird-watching over its use as a commuter route.

One of the proposed trail improvements that would be funded by the non-Federal sponsors (i.e., is not cost-shared by the USACE) is creating a paved section of the planned Bay Trail along SR 237. Once this trail is paved and linked to other existing Bay Trail segments, users would be able to quickly and more safely pass through the area. This would have the added benefit of reducing the potential numbers of people who might use the Refuge trails to connect between the existing Coyote Creek section of the Bay Trail east of the study area and the Sunnyvale section of the Bay Trail west of the study area for purposes other than Refuge visitation. Trail users would still be able to easily access the Refuge trails but would have the option of using the more direct, paved SR 237 trail. This is a beneficial impact.

Pond A18 (about 860 acres), owned by the City of San José, is also included in the Shoreline Phase I Study Area, although it is not included in the SBSP Restoration Project study area and is not covered in the SBSP Restoration Project Programmatic EIS/EIR. Although Pond A18 was not considered in the SBSP Restoration Project, primarily due to not being a USFWS-managed property, the actions being proposed for the pond are similar to those proposed for the rest of the Alviso Complex ponds, and the addition to the Shoreline Phase I Study Area is consistent with the goals for the greater South Bay tidal restoration". Pond A4, owned by the Santa Clara Valley Water District (SCVWD), and Pond A18, owned by the City of San Jose, are not part of the SBSP Restoration Project; therefore, the condition of these ponds was assessed through coordination with the respective landowner.

Dean Stanford
510-676-3339

DAVE CORTESE

COUNTY OF SANTA CLARA SUPERVISOR, DISTRICT THREE

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August 31, 2018

Kerrie Romanow
Director, Environmental Division
200 E. Santa Clara St, 10th floor
San Jose, CA 95113-1905

Dear Director Romanow,

A constituent, Dean Stanford, approached me regarding a proposal to add an additional recreational component to the South Bay Shoreline Project. As you know, Dean has been actively engaged in pursuing a specific proposal to provide an all-electric recreational vehicle demonstration and multi-use park on pond A18 adjacent to the San Jose Waste Water Treatment Plant. I understand that Dean was informed that he has time to petition the City of San Jose for this preferred use of pond A18. I encourage you to respond to this proposal.

Sincerely,

Dave Cortese
Santa Clara County Board of Supervisors



RO KHANNA
17TH DISTRICT, CALIFORNIA

COMMITTEE ON
ARMED SERVICES

COMMITTEE ON
THE BUDGET

Congress of the United States
House of Representatives
Washington, DC 20515-0517

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khanna.house.gov

Martin Kodis
Chief, Division of Congressional and Legislative Affairs
U.S. Fish and Wildlife Service
U.S. Department of the Interior
5275 Leesburg Pike, 2N035
Falls Church, VA 22041

Dear Mr. Kodis,

Enclosed is a copy of the correspondence I have received from my constituent Dean Sanford, concerning the South Bay Shoreline Project. Mr. Sanford detailed his plan to expand the recreational area available at the Don Edwards Wildlife Refuge.

Mr. Sanford is concerned about the South Bay Shoreline Project, which is sacrificing a nine-mile San Francisco Bay loop trail for environmental restoration. Mr. Sanford finds the recreation area expansion plan within this project to be insufficient, with unattractive trails between active landfills, the sewage treatment plant, and along the freeway. Mr. Sanford has instead proposed a plan to expand recreation area nearby.

I am supportive of environmentally-friendly recreation and efforts to protect our parks and preserve our environment. It is our responsibility to keep our planet healthy and safe for our children and future generations. One way to do that is to expand open spaces, and as a representative from the Bay Area, I recognize the importance of expanding the public park space that makes the land around the San Francisco Bay beautiful.

I encourage you to give full and fair consideration to Mr. Sanford's proposals consistent with all applicable laws and regulations. If you need any additional information from my office, please contact Kevin Fox either by email at kevin.fox@mail.house.gov or by phone at 202-225-2631. Thank you for your attention and consideration of this request.

Sincerely,



Ro Khanna
Member of Congress

CC: Jennifer Greer, US Army Corps of Engineers



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Room W-2606
Sacramento, California 95825-1846

In Response Reply To:
FWS/R8/068613

The Honorable Ro Khanna
United States House of Representatives
Washington, D.C., 20515

Dear Representative Khanna:

Thank you for your letter of July 19, 2018, regarding concerns from your constituent, Dean Stanford, about recreational access at the South Bay Shoreline Project (project). The U.S. Fish and Wildlife Service (Service) is a key partner in the Project and appreciates ongoing input from the public on improving recreation at Don Edwards San Francisco Bay National Wildlife Refuge (Refuge).

The project, led by the U.S. Army Corps of Engineers, will rebuild levees that provide critical flood protection to communities in San Jose, as well as the San Jose-Santa Clara Regional Wastewater Facility. While the levee design must meet flood control standards and allow truck access for maintenance, the project will also provide new opportunities for public recreation and restore important wildlife habitat. The project will provide trail connectivity to the Guadalupe River/Alviso Slough, Coyote Creek and the Regional Bay Trail. Though breaching and habitat restoration have necessitated a gap in some loop trails, the project also includes 10.6 miles of new and enhanced trails. New pedestrian bridges and observation platforms along the flood levee will further improve trail connectivity.

As Mr. Stanford mentioned in his letter, some Refuge lands are part of the project. However, the portion of the project along Pond A-18, in which Mr. Stanford is advocating for expanded recreational access, is not part of the Refuge and is owned by the city of San Jose. We encourage Mr. Stanford to continue to engage with the city on that aspect of the project.

Thank you for your interest in this important project. For any additional questions or concerns, please contact the Service's Pacific Southwest Refuge Chief, Ms. Polly Wheeler, at (916) 414-6476 or Polly_Wheeler@fws.gov.

Sincerely,

Paul Souza
REGIONAL DIRECTOR

TO: Board of Directors

FROM: Nina Hawk

SUBJECT: Update on Agreements Related to the Coordinated Operations of the State Water Project and Central Valley Project, and the California WaterFix

DATE: December 21, 2018

On December 12, 2018, the Department of Water Resources (DWR) and United States Bureau of Reclamation (Reclamation) executed three agreements related to the coordinated operations of the State Water Project (SWP) and Central Valley Project (CVP) and the California WaterFix (WaterFix). DWR also submitted a letter to several water agencies communicating its expectation that these agencies withdraw all protests related to WaterFix and refrain from any future challenge to regulatory processes or litigation on the WaterFix. These documents are described below.

1. Addendum to Coordinated Operations Agreement – The Addendum to the Agreement for Coordinated Operations of the Central Valley Project and State Water Project (Attachment 1) amends the original 1986 agreement by revising the respective obligation of DWR and Reclamation for meeting Delta regulatory standards and updates the sharing of export capacity from SWP and CVP facilities, as well as modifying the agreement review and revisions process. Staff's assessment is that the agreements would reduce the District's annual average SWP supplies by roughly 5 TAF and increase the District CVP supplies by a comparable amount while potentially increasing CVP public health and safety supplies to the District during critically dry years.
2. Memorandum of Agreement for Implementation of the Biological Opinions – The Memorandum of Agreement for the Implementation of the 2008 and 2009 Biological Opinions for the Coordinated Operations of the Central Valley Project and State Water Project (Attachment 2) identifies funding for both the joint and individual requirements for DWR and Reclamation as set forth in the Biological Opinions for the long-term coordinated operations of the SWP and CVP. It also establishes procedures for cooperation and collaboration between the two projects, as well as to prioritize activities to satisfy the requirements of the Biological Opinions. The agreement will likely facilitate implementation of required actions to protect fish and restore habitat in the Delta, which would both improve the Delta environment and improve water supply reliability.
3. Agreement to Address the Effects of California WaterFix on Central Valley Project Operations (No Harm Agreement) – The Agreement to Address the Effects of the California WaterFix on Central Valley Project Operations (Attachment 3) requires that DWR avoid, mitigate, or offset any CVP water supply reduction resulting directly from WaterFix operations if the WaterFix is not fully integrated into operations of the CVP. The Agreement also requires Reclamation to maintain its participation in the WaterFix Change Petition before the State Water Resources Control Board until a draft order is issued, or the State Water Resources Control Board has announced an intention to issue a final order.
4. Letter to Protestants – DWR issued a letter (Attachment 4) to several water agencies and stakeholder groups communicating its expectation that, in light of the agreements described above, these entities would withdraw all existing protests and refrain from any future litigation or challenges to regulatory processes related to WaterFix.



Nina Hawk
Chief Operating Officer
Water Utility Enterprise

Attachment 1: Addendum to Coordinated Operations Agreement
Attachment 2: Memorandum of Agreement
Attachment 3: No Harm Agreement
Attachment 4: Letter to Protestants

**ADDENDUM TO
THE AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF CALIFORNIA
FOR COORDINATED OPERATION OF THE
CENTRAL VALLEY PROJECT AND THE STATE WATER PROJECT**

This addendum to the 1986 Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and State Water Project ("Agreement") is entered into by the United States and the State of California, this 12 day of December, 2018, in light of the following:

EXPLANATORY RECITALS

After the execution of the Agreement in 1986, the United States added facilities to the Central Valley Project, including the Red Bluff Pumping Plant and Fish Screen and the Delta Mendota Canal California Aqueduct Intertie.

After the execution of the Agreement in 1986, the State added facilities to the State Water Project, including the Barker Slough Pumping Plant and the Harvey O. Banks Pumping Plant 4-pump expansion.

In 1995 and 2006 the California State Water Resources Control Board established New Delta Standards.

Implementation of New Delta Standards imposed restrictions on the operations of the Central Valley Project and the State Water Project, including new restrictions on Delta exports by the United States and the State and new Delta outflow for the protection of aquatic species in the Delta.

After execution of the Agreement in 1986, biological opinions for the coordinated operations of the Central Valley Project and State Water Project were issued pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) that further restricted operations of the Projects and affected the ability of the United States and the State to achieve their respective water supply objectives.

The United States and the State have heretofore shared responsibility for meeting New Delta Standards and export capacity when exports were constrained by biological opinions for the coordinated operations of the Central Valley Project and the State Water Project through agreements reached between operators of the Central Valley Project and operators of the State Water Project.

The United States and the State have determined that periodic review pursuant to Article 14 of the Agreement would promote achieving their respective water supply objectives considering the New Delta Standards and the restrictions imposed under the Endangered Species Act.

NOW, THEREFORE, it is agreed:

1. Article 6(c) of the Agreement is amended to provide:

(c) Sharing of Responsibility for Meeting Sacramento Valley Inbasin use With Storage Withdrawals During Balanced Water Conditions: Each party's responsibility for making available storage withdrawals to meet Sacramento Valley inbasin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley inbasin use of storage withdrawals by the following percentages:

	<u>United States</u>	<u>State</u>
Wet Years	80%	20%
Above Normal Years	80%	20%
Below Normal Years	75%	25%
Dry Years	65%	35%
Critical Years	60%	40%

The water year classifications described in this Article 6(c) shall be based on the Sacramento Valley 40-30-30 Index as most recently published through the Department of Water Resources' Bulletin 120.

In a Dry or Critical Year following two Dry or Critical Years, the United States and State will meet to discuss additional changes to the percentage sharing of responsibility to meet inbasin use.

2. A new Article 10(i) is added to the Agreement to provide:

(i) Sharing of Applicable Export Capacity When Exports are Constrained: During periods when exports are constrained by non-discretionary requirements imposed on the Central Valley Project and the State Water Project South Delta exports by any federal or state agency, applicable export capacity shall be shared by the following percentages:

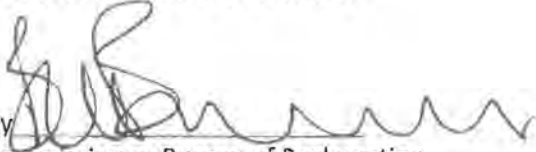
	<u>United States</u>	<u>State</u>
Balanced Water Conditions	65%	35%
Excess Water Conditions	60%	40%

3. Article 10(b) of the Agreement is amended to provide:

- (b) The State will transport up to 195,000 acre-feet of Central Valley Project water through the California Aqueduct Reaches 1, 2A, and 2B no later than November 30 of each year by direct diversion or by redirection of stored Central Valley Project water at times those diversions do not adversely affect the State Water Project purposes or do not conflict with State Water Project contract provisions. The State will provide available capacity at the Harvey O. Banks Pumping Plant ("Banks") to the Central Valley Project to divert or redirect 195,000 acre-feet when the diversion capacity at the south Delta intake to Clifton Court Forebay is in excess of 7,180 cubic feet per second during the July 1 through September 30, except when the Delta is in Excess Water Conditions during July 1 through September 30, the diversion capacity at the south Delta intake to Clifton Court Forebay in excess of 7,180 cubic feet per second shall be shared equally by the State and the United States. This Article does not alter the Cross-Valley Canal contractors' priority to pumping at the Harvey O. Banks Pumping Plant, as now stated in Revised Water Rights Decision 1641 (March 15, 2000).
4. Pursuant to Article 11, Exhibit A will be updated to conform with Delta standards established by the State Water Resources Control Board in the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.
5. Exhibit B shall be updated based on a joint operations study of the amendments as agreed to in this addendum.
6. Article 14(a) of the Agreement is amended to provide:
- (a) Prior to December 31 of the fifth full year following execution of this agreement, and before December 31 of each fifth year thereafter, or within 365 days of the implementation of new or revised requirements imposed jointly on Central Valley Project and State Water Project operations by any federal or state agency, or prior to initiation of operation of a new or significantly modified facility of the United States or the State or more frequently if so requested by either party, the United States and the State jointly shall review the operations of both projects. The parties shall (1) compare the relative success which each party has had in meeting its objectives, (2) review operation studies supporting this agreement, including, but not limited to, the assumptions contained therein, and (3) assess the influence of the factors and procedures of Article 6 in meeting each party's future objectives. The parties shall agree upon revisions, if any, of the factors and procedures in Article 6, Exhibits B and D, and the Operation Study used to develop Exhibit B.
7. A new Article 14(c) is added to the Agreement to provide:
- (c) For any triggering event requiring review under Article 14 that occurs after December 15, 2018, either party may move directly to the Advisory Board process. The

Advisory Board, consisting of one member designated by each party and a third member chosen by both parties, shall report its unanimous recommendations to both parties at a date not to exceed 180 days from which the matter was referred to the Advisory Board and the parties shall amend this agreement and immediately begin to operate in accordance with the recommendation. If the Advisory Board fails to make unanimous recommendations with the 180 day period, either party may unilaterally terminate this agreement.

THE UNITED STATES OF AMERICA

By 
Commissioner, Bureau of Reclamation

THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF CALIFORNIA

By 
Director, Department of Water Resources

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 12TH 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 that Exhibits A, B, and C will be revised and updated within 30 days of execution of the Memorandum of Agreement.

Exhibit A

SHARED BiOp COMPLIANCE RESPONSIBILITIES v1.05_22MAY2017

Line Item	Requirements Information				DWR Projects & Operational Tasks & Activities	USBR Projects & Operational Tasks & Activities	
	Agency	Adopted BLM/USFWS Requirement	Requirement Description	Related Activity			
1.0	NMFS	11.2.1.3 (1)	Active	1) Reclamation and DWR 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)	Red Bluff Diversion Dam Rotary Trap Juvenile Monitoring Project: Quantification of passage and production of juvenile salmonids produced in the upper Sacramento River, CA. Sacramento River Basin Salmonid Monitoring: 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) Reclamation and DWR 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. Reclamation and DWR 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) Reclamation and DWR 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) Reclamation and DWR 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 B-300, Sacramento, California 95814-4706). 5) Reclamation and DWR 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) Reclamation and DWR 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	Reclamation and DWR 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, netted surveys, weir counts, and rotary screw trapping. b) RBD: 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 RBD 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 Kotick 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: OOD Steelhead Monitoring Program OPCM: Rotary Screw Trap Monitoring - Sacramento River OPCM: Salmonid Monitoring	Juvenile Salmon Monitoring: 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>Reclamation 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). DWR shall direct discretionary funds for Phase 1B and Phase 2, consistent with the proposed amended Delta Fish Agreement by December 31 of each year. Reclamation and DWR 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>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.</p>	11.2.2: Action I	<p>FRPA: Battle Creek Salmon and Steelhead Restoration Project *Action Completed - 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. 12/18/2013: 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 confirm 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 BOP." 5/6/2015: 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>	<p>Additional monitoring will be conducted to ensure performance objectives are achieved. Annual progress report to NMFS to be completed by USBR.</p>
7.0	NMFS	11.2.2: Action 1.6 (Suite)	Active	<p>Sacramento River Basin Salmonid Rearing Habitat Improvements Objective: 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, Reclamation and DWR, 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	<p>See subsections below.</p>	<p>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 CVP/M6. 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.</p>
8.0	NMFS	11.2.2: Action 1.6.1	Active	<p>Restoration of Floodplain Rearing Habitat <i>"In cooperation with CDFG, USFWS, NMFS, and the Corps, Reclamation and DWR shall..."</i>, 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) Objective: 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) FRPA: Dunder Island (SE) Acquisition and Habitat Restoration FRPA: Prospect Island Tidal Habitat Restoration FRPA: Yolo Red Restoration Project YBR: Yolo Bypass Salmonid Habitat Restoration and Fish Passage BDE-R</p>	
9.0	NMFS	11.2.2: Action 1.6.2	Active	<p>Near-Term Actions at Liberty Island/Lower Cache Slough and Lower Yolo Bypass By September 30, 2010, Reclamation and/or DWR 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 <i>final monitoring report shall be submitted on September 30, 2015, or in the fifth year following implementation of enhancement actions</i>. 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. Objective: This action shall be designed to avoid stranding or migration barriers for juvenile salmon.</p>	11.2.2: Action I	<p>FRPA: Liberty Island/Lower Cache Slough 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>Lower Putah Creek Enhancements By December 31, 2015, Reclamation and/or DWR 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, Reclamation and/or DWR 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. Objective: This action shall not result in stranding or migration barriers for juvenile salmon.</p>	11.2.2: Action I	<p>YBR: Lower Putah Creek Restoration Project The project is being developed under a CDFW grant by the Yolo Basin Foundation. The grant expires March, 2016. A progress report was sent to NMFS in September 2015. This RPA Action has been identified as an Early Implementation Project under the State's CA Ecoliberty Initiative.</p>	

11.0	NMFS	11.2.2: Action I.6.4	Active	<p>Improvements to Lisbon Weir</p> <p>By December 31, 2015, Reclamation and/or DWR 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, Reclamation and/or DWR 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>Objective: 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>FR: Lisbon Weir Fish Passage Project 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 Ecosystem Initiative.</p>	
12.0	NMFS	11.2.2: Action I.7	Active	<p>Reduce Migratory Delays and Loss of Salmon, Steelhead, and Sturgeon at Fremont Weir and Other Structures in the Yolo Bypass</p> <p>Objective: 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>Action: By December 31, 2011, as part of the plan described in Action I.6.1, Reclamation and/or DWR 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, Reclamation and/or DWR 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, Reclamation 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, Reclamation 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. Reclamation and/or DWR 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>FR: 2016 Yolo Bypass Salmon Study (YBSS) FR: Fremont Weir Adult Fish Passage Modification Project FR: Wallace Weir Fish Rescue Facility Project FR: Yolo Bypass Salmonid Habitat Restoration and Fish Passage DB-R</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 Ecosystem Initiative. Wallace Weir improvements are the highest priority (implementation scheduled for 2016), followed by Yolo 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>3D Flow Modeling of Selected Sections on the Sacramento River for Fish Bypass Projects: 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 NMFS IV.2.2</p>
13.0	NMFS	11.2.2: Action IV.1.1	Active	<p>Monitoring and Alerts to Trigger Changes in DCC Operations</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. Reclamation and DWR 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). Reclamation and DWR 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, Reclamation, and DWR. 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 WDMT 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>Objective: 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 100%. Pending response from NMFS to DWR and Reclamation accepting the Mill & 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 Red Bluff Diversion Dam (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>DCC Gate Operation</p> <p>Objective: Modify DCC gate operation to reduce direct and indirect mortality of emigrating juvenile salmonids and green sturgeon in November, December, and January.</p> <p>Action: 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>Implementation procedures: Monitoring data related to triggers in the decision tree will be reported on DAT calls and evaluated by DOSS (for formation of DOSS – see Action IV.5). Reclamation/DWR 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 WDMT standard operating procedures.</p>	11.2.2: Action IV	<p>NMFS DCC Gates operations had been modified according to the 2016 Drought Contingency Plan For Water Project Operations February - November 2016, p. 25 - see below:</p> <p>III. Delta Cross Channel Gates Based on current and projected water quality in the Delta, and at least 3 weeks prior to any need to open the DCC gates, Reclamation and DWR will determine whether adjustments in the timing of the opening of the DCC gates should occur in order to address the projected effects 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 when to open 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>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</p> <p>Objectives: 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>Action: Reclamation and/or DWR 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, Reclamation or DWR shall subject any proposed engineering solutions to external independent peer review and report the initial findings to NMFS by March 30, 2012. Reclamation or DWR shall provide a final report on recommended approaches by March 30, 2015. If NMFS approves an approach in the report, Reclamation or DWR 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 ES: Engineering Solutions Study ES: Georgiana Slough Non-Physical Barrier (2011 and 2012) 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>San Joaquin River Inflow to Export Ratio</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 Index³². 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 SJRA 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. Reclamation shall continue to implement the Goodwin flow schedule for the Stanislaus River prescribed in Action III.1.3 and Appendix 2-E. 2. Reclamation and DWR 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>Objective: 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 IE 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 RFA 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 fits into the CVP-SWP Coordinated Operations Agreement (COA). 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>Six-Year Acoustic Tag Experiment</p> <p>Action: Reclamation and DWR 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>Objective: 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: Six-Year Steelhead Study</p>	6-Year Steelhead Telemetry Study Analysis and Reporting: Study was designed to use results from the Six-year steelhead telemetry study during 2013-2016 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 2013-2016 results by the end of FY19. 3D Flow Modeling of Selected Sections on the Sacramento River for Fish Bypass Projects: 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 RFA science needs. Also applies to NMFS 1.7.3
18.0	NMFS	11.2.2: Action IV.2.3	Active	<p>Old and Middle River Flow Management</p> <p>Action: 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>Objective: 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 last delivery 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>Reduce Likelihood of Entrainment or Salvage at the Export Facilities</p> <p>Action: 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.3.1), 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>Objective: 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: Coded Wire Tagging (CWT)</p> <p>OPWM: DCO Delta Optimalities SWP Only</p> <p>OPCM: DCO Delta Modeling</p> <p>OPWM: DCO Export Mgmt Compliance Report SWP Only</p> <p>OPWM: DCO Export Mgmt Impact Actg SWP Only</p> <p>OPWM: DCO Export Mgmt Short-Term Planning SWP Only</p> <p>OPWM: DCO Water Mgmt Long-Term Analysis SWP</p> <p>NOTE: During WY 2013, no triggers were tripped that required action under RPA IV.3.</p>	<p>Coleman Hatchery Late Fall Chinook Tagging: 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 subcontractors. 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>Modifications of the Operations and Infrastructure of the CVP and SWP Fish Collection Facilities</p> <p>Action: Reclamation and DWR shall each achieve a whole facility salvage efficiency of 75 percent at their respective fish collection facilities. Reclamation and DWR 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, Reclamation and DWR shall fund quality control and quality assurance programs, genetic analysis, lower 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>Objective: 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: Skinner Evaluations and Improvements</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: IV.4.2 (A)(2a)(2b)(3) Skinner Fish Collection Facility Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency.</p> <p>Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at state facilities.</p>	<p>USBR-Only: IV.4.1 Tracy Fish Collection Facility (TFCF) Improvements to Reduce Pre-Screen Loss and Improve Screening Efficiency.</p> <p>Objective: 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>Tracy Fish Collection Facility and the Skinner Fish Collection Facility Actions to Improve Salvage Monitoring, Reporting and Release Survival Rates</p> <p>Action: Reclamation and DWR 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>Objective: 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 DMR 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 observation 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 sal vaged 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 the 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) Reclamation and DWR 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: Skinner Evaluations and Improvements</p> <p>11.2.2: Action IV.4.3 (1)(3)(4)(5)(6)(7)(8)</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> <ul style="list-style-type: none"> • Curtis Landing: A complete refurbishment of this site was completed in 2014 and the site became operational in early 2015. • Little Baje/Mango Ranch: Two new fish release sites on Liberman 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 2013. • Predation monitoring utilizing DIDSON technology has been ongoing at the Curtis Landing and Horsehoe 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. • Debris removal at Horsehoe Bend and Curtis Landing sites conducted bi-annually on an as needed basis. No debris removal was required in WY 2014. • Reclamation has taken the lead on analyzing opportunities for transporting and releasing fish by barge. <p>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.</p>	<p>11.2.2: Action IV.4.3 (2)</p> <p>NOTE: Reclamation's Central Valley Operations Office is the lead on this action. Fish salvage data presently available through CVO and DFW websites: www.cvo.gov/mo/cvo/fishrpt.html and www.dfw.ca.gov/delta/data/salvage. DFW improved the salvage website in 2010.</p>
22.0	NMFS	11.2.2: Action IV.5	Complete	<p>Objective: 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>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. (p 781)</p> <p>Objective: 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>4. Reclamation and DWR 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>5. Reclamation and DWR 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>Reclamation and DWR 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. 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.</p> <p>a. Reclamation and DWR 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. (p 782)</p>	13.4	Activities ongoing and being completed by both agencies.
27.0	NMFS	13.4 (1 b)	Active	<p>b. Reclamation and DWR 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. Reclamation and DWR 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. Reclamation and DWR 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. Reclamation and DWR 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, Reclamation and DWR shall immediately convene the WOMT 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. Reclamation and DWR 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. Reclamation and DWR 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. Reclamation and DWR shall annually report to NMFS the incidental take resulting from the implementation of the Proposed Action.</p> <p>a. Reclamation and DWR 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. Reclamation and DWR 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. Reclamation and DWR 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>Improve Habitat for Delta Smelt Growth and Rearing: ESTUARINE HABITAT DURING FALL</p> <p>Objective: 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 8, during September and October in years when the preceding 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 preceding all inflow into CVP/SWP reservoirs in the Sacramento Basin shall be added to reservoir releases in November to provide an additional incremental 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-1543. 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 8. 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 8 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	OPCM: BIOP Water Supply Impact Accounting OPCM: DCO Delta Modeling OPWM DCO Export Mgmt Compliance Report SWP Only OPWM DCO Export Mgmt Impact Actig SWP Only OPWM DCO Export Mgmt Short-Term Planning SWP Only OPWM DCO DCO Water Mgmt Long-Term Analysis SWP
37.0	USFWS	RPA Component 5	Active	<p>Monitoring and Reporting</p> <p>Reclamation and DWR shall ensure that information is gathered and reported to ensure:</p> <ol style="list-style-type: none"> 1) proper implementation of these actions, 2) that the physical results of these actions are achieved, and 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) 	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>RPM 1. Minimize adverse effects of the operations of the Permanent Operable Gates**.</p> <p>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. (p 294)</p> <p>T&C 1: The following Term and Condition implements Reasonable and Prudent Measures one (1)</p> <ol style="list-style-type: none"> 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><small>** NOTE: The referenced Permanent Operable Gates were never constructed, thereby this requirement currently does not apply to either USBR or DWR. Partnering with DWR and USBR on 11/4/2015, this requirement is shared USBR/DWR due to several factors and longstanding conditions</small></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>RPM 3: Obtain real time data on the abundance and distribution of delta smelt in the Bay-Delta. (p 294)</p> <p>T&C 3 (1): The following Terms and Conditions implement Reasonable and Prudent Measures three (3):</p> <ol style="list-style-type: none"> 1. During the months of December through July, when water is being diverted, Reclamation and DWR shall ensure that the frequency of sampling for delta smelt at Banks and Jones will be at least 25 percent of the time. 	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>RPM 3: Obtain real time data on the abundance and distribution of delta smelt in the Bay-Delta.</p> <p>T&C 3 (2): Reclamation and DWR 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>RPM 4: Minimize adverse effects of Banks and Jones on delta smelt.</p> <p>T&C 3 (2): The following Term and Condition implements Reasonable and Prudent Measures four (4):</p> <p>1. Reclamation will develop within 30 days a methodology for dealing with transitions in operations after changes in OMR flow requirements.</p> <p><i>Note: Banks is a DWR operated facility.</i></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 Reclamation and DWR. (p 295)	USFWS		
43.0	USFWS	Reporting Requirements	Active	<p>Reclamation or DWR 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

DWR Only					
11.2.2: Action IV.4.2 (f)	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 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 bays.	DWR shall undertake p 665	One Time	12/31/2012
11.2.2: Action IV.4.2 (g)	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 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. <i>By March 31, 2014, DWR shall submit a report on the results of the studies to the USFWS. If the studies show that the loss is greater than 40 percent, DWR shall submit a report on the results of the studies to the USFWS.</i>	Based on Location this is a DWR BiOp	One Time	3/31/2014
11.2.2: Action IV.4.2 (h)	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 state facilities. Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility: 3) 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. 4) DWR may petition the Fish and Game Commission to increase bag limits on striped bass caught in Clifton Court Forebay.	DWR may petition p 665	On-Going	3/31/2011 Weekly Additional Bag Limits for striped bass needed
11.2.2: Action IV.4.2 (i)	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 state facilities. Action: DWR shall undertake the following actions at the Skinner Fish Collection Facility: 5) 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.	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 Outlet)	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: 6) 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.	DWR shall not implement p 666	One Time	when the analyses of the operations of the temporary barriers is completed
13.4 (f) (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 eliminate take of listed salmonids.	DWR shall collect additional data p 762	On-Going	TBD (Clifton Court Forebay) TBD (Harvey Banks pumping plant)
13.4 (f) (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. f. 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 remittance 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 must be stored at the USFWS BayDelta 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 763	On-Going	TBD (John Skinner Fish Collection Facility) 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 finds the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation: 5. DWR should continue to fund the Amendment 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 Butte County and habitat improvements at the Yolo Bypass, Liberty Island and other areas.	DWR should continue to fund p 765	On-Going	Acceptance of the BiOp

Litigation BCH Remedial Litigation	Remand Litigation for USFWS and NMFS BOPs	<p>The Bureau of Restoration began formal consultation in 2008 with the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) on the coordinated, long-term restoration 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 reviewed 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 participating 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 Remedial Statement 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 various parties in the Consolidated Salmon Case and Consolidated Delta-Snell Cases. These discussions attempted to reach a negotiated 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 acoustation 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 committed 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> <ol style="list-style-type: none"> 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. 2. Sponsored Participants: Provides funding for contractors representing WDOs and PMUs or CAMT and existing teams, including the Salmon Scoping Team and others. 3. Technical Studies: Represents investigations developed based on extensive dialogue within the CAMT Delta-Snell Scoping Team (DSST) and Salmon Scoping Team (SST). 4. Peer Review: Includes coordinating with and funding independent peer reviews through the Delta Science Program (DSP). <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 and staff commitment 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-Snell 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-Snell	<p>Another high-priority 2014 Workplan element for Delta-Snell 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 5.</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 DWR, UWR, 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 include 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 have 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 ("IEP") Management Team and IEP 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. DWR has reviewed the requirements of Permit Condition 8.4 and has determined that the effectiveness and performance monitoring program for the Redwing River Diversion Structure (RRDS) and the Sherman Island Diversion Structures (SIS) does not require the inclusion of implementation or on-implementation studies. The U.S. Fish and Wildlife Service 2008 Biological Opinion for Delta-Snell (Service File No. 814GD-2008-F-1481-5) already requires implementation and on-implementation studies for the Barker Slough Diversion, which is referenced as the NEA in Permit Condition 8.4, but the Biological Opinion does not have requirements for RRDS or SIS.</p> <p>e. Subject to Section 268, 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 limited 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 drilling, engineering, construction, and permit processes involving the SWP and Longfin, DWR 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 language 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 language captured	One Time	2/25/2009
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 language 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 (2008 CCAP 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 language captured	On-Going	When there is a drought or unanticipated Emergency Condition
Condition 5.1	Flow Measures	"This Condition is not likely to occur in many years." To protect adult longfin smelt migration and spawning during the December through February period, the Staff Working Group (SWG) or DFG SWG personnel shall provide QIC and Middle River (CMR) flow advice to the Water Operations Management Team (WOMT) and to Director of DFG (Director) weekly.	all ITPs are DWR Only, no language 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 CMR flow advice to the WOMT and to the Director weekly.	all ITPs are DWR Only, no language 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.
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 language 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 stocked at Stations 715. 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 5.4	Additional Minimization Measures	To minimize take of longfin smelt at MOS diversion, in addition to any existing operating rules.	all ITPs are DWR Only, no language captured	One Time	12/31/2018 (Within 1 Year of Permit Issuance)
				On-Going	Annually (January 15 - December 31)
Condition 5.5	Additional Minimization Measures	To ensure the minimization measures designed to minimize take of the Covered Species are effective.	all ITPs are DWR Only, no language captured	One Time	6/23/2019 (Within 3 Months of Permit Issuance)
Condition 5.5.1	Additional Minimization Measures	Improve the survival rates of longfin salvage at the Gilmer Facility	all ITPs are DWR Only, no language captured	One Time	TBD (After Plan has been approved)
					TBD (Within 1 Year of the Permit Issuance)
Condition 5.6	Additional Minimization Measures	Minimization measures to protect longfin smelt	all ITPs are DWR Only, no language captured	On-Going	TBD (Upon approval by DFG and compliance with any applicable law including CEQA)
Condition 5.6.1	Additional Minimization Measures	Unplanned sewage outages greater than 1 hour	all ITPs are DWR Only, no language captured	On-Going	Annually (November 1 - June 30)
Condition 5.6.2	Additional Minimization Measures	For all planned sewage 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 language captured	On-Going	Annually (November 1 - June 30)
Condition 5.6.3	Additional Minimization Measures	Export rates shall not increase during any outage period.	all ITPs are DWR Only, no language captured	On-Going	Annually (November 1 - June 30)
Condition 5.7	Additional Minimization Measures	To ensure the minimization measures designed to minimize take of the Covered Species are effective	all ITPs are DWR Only, no language captured	One Time	6/23/2019 (Within 3 Months of Permit Issuance)
				On-Going	Annually (November 1 - June 30)
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. 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.	all ITPs are DWR Only, no language captured	One Time	03/02/2009 (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 7.3	Measures That Contribute to Full Mitigation	Objective: Evaluation of all land acquired for the purpose of implementing this Condition	all ITPs are DWR Only, no longaged 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 appeals and adequate information is gathered to evaluate the effectiveness of these actions on the targeted life stages of forfin small so that the actions can be refined, if needed.	all ITPs are DWR Only, no longaged 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 FHWI, Spring Kodiak Trout, 20-mm Smelt, Smelt Larval Surveys, and Bay Shad.	all ITPs are DWR Only, no longaged captured	On-Going	Annually
Condition 8.2	Monitoring and Reporting	Permittee shall fund additional monitoring related to the extent of the incidental take of forfin 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 DWR flow requirements for entrainment reduction of forfin smelt larvae. Funds resulting shall cover additional staff and equipment that are reasonably needed to such monitoring.	all ITPs are DWR Only, no longaged 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 longaged 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 program)
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 Shoshone Island diversions.	all ITPs are DWR Only, no longaged 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 longaged 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 longaged 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 longaged 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 8.1	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 TTPs are DWR Only, no language captured	One Time	02/23/2017 (Within 6 Years of Permit Issuance & Land Parcel identified and funding needs to be acquired)
					02/23/2019 (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 assures funding to complete those activities by providing funding assurance to DFG.	all TTPs are DWR Only, no language 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)
					02/23/20 (Within 3 Months after the Permit Effective Date)

USFWS					
FPM 2.18C.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	2/5/2009
				On-Going	Annually (January - June)
Grand Total					

Exhibit C

Summary of USBR Only BIOPS

CBM USBR Only

11.2.1.1 (1-5)	Responsibilities and Processes 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"> • Sacramento River Temperature Task Group (SR TTG) • Clear Creek Technical Working Group (CCTWG) • American River Group (ARG) • San Joaquin River Technical Committee (SJRTC) <p>This RPA requires the creation of three additional technical teams:</p> <ul style="list-style-type: none"> • Delta Operations for Salmon and Sturgeon (DOSS) Group • Status Quo Operations Group (SQG) • Interagency Fish Passage Steering Committee <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 that particular geographic area. Under previous operations plans, recommendations for adjustments were made by 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.</p> <p>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 operational parameters that are necessary to avoid jeopardizing listed species or adversely modifying their critical habitat. Within those 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 those 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-evaluation.</p> <p>The action prescribes standard operating procedures for decision-making that will apply to all teams.</p> <ol style="list-style-type: none"> 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 ensure that necessary administrative steps are taken, such as recording and distributing meeting notes and recommendations. 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 to his or her director, or on request of NMFS or any two or more group members. 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. 	Reclamation shall p 562
11.2.1.2 (1-5)	Research and Adaptive Management	<p>after Science Peer Review process, Reclamation and NMFS shall host a workshop to review the prior year's operations and to determine whether any measures prescribed in this RPA should be altered in light of information learned from prior year's 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 Option'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 experimental and technical teams to assess the need for a particular amendment and make recommendations to NMFS, according to the group protocols for decision-making set forth in this RPA in action 11.2.1.1 above.</p> <p>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"> 1) Cooperative development of a salmonid biology model acceptable to NMFS, Reclamation, CDFG, and DWR 2) Temperature monitoring and modeling identified in RPA Action 1.5 3) Green sturgeon research described in the RPA action 4) Testing habitat evaluation metrics to guide nesting habitat Action 1.8 5) A 6-year acoustic-tagged study of juvenile steelhead outmigration in the San Joaquin River and through the southern Delta identified in Action 1.2.2. 	Reclamation and NMFS shall host p 563
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 aid in determining the benefits and effects of flow and temperature management.	Reclamation shall coordinate
11.2.2 Action 1.1 (Suite)	Clear Creek	<p>State Objective: The proposed action includes a static flow regime (no greater than 300 cfs at year) and uncertainty as to the availability of 60 cfs year in the future pose significant risk to listed 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.</p>	Reclamation shall p 567
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 567
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 568
11.2.2 Action 1.1.3	Spawning Ground 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 569
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.	Reclamation shall replace p 568
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 p 569
11.2.2 Action 1.1.6	Adaptively Manage to Habitat Viability/FM 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 viability.	Reclamation shall operate p 569
11.2.2 Action 1.2.1	Performance Measures	Objective: To establish and operate 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 change in hydrology will be maintained and maintained.	Reclamation shall track p 572
11.2.2 Action 1.2.2A	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 conserve p 593
11.2.2 Action 1.2.2B	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 conserve p 594
11.2.2 Action 1.2.2C	Implementation and Exception Procedures for EOS Storage at 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 Kenwick Release Schedule (Spring Action)	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 track p 597
11.2.2 Action 1.2.3A	Implementation Procedures if February Forecast, Based on 90 Percent Hydrology, Shows that Bally 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 Bally 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 Kenwick releases in March, April, and May consistent with its standard plan of operations. Preparation of a separate Kenwick release schedule is not necessary in these circumstances.	Reclamation shall announce p 599
11.2.2 Action 1.2.3B	Implementation Procedures if February Forecast, Based on 90 Percent Hydrology, Shows that Only Bally 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 1.2.3C	Drought Operation 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-third 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 50 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 (quality, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100) are also conflicting 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 late 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 Kenwick 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 Kenwick Dam and United Bridge, while maintaining sufficient cold water storage for fall-run exports. To the extent feasible, releases for suitable temperatures for habitat temperature for fall-run.	Reclamation shall develop and maintain p 601
11.2.2 Action 1.2.5	Restore Bally 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 Bally Creek watershed. A second population of winter-run would reduce the risk of extinction of the species from loss of range and increased vulnerability to catastrophic events.	Reclamation shall direct p 603

11.2.2 Action 1.2 (State)	Fixed BMT Diversion Dam (RBCO) Operations	Objective: 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 or 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 projects are constructed replace the loss of the diversion structure.	Reclamation shall operate retain / continue / provide / remove / remove p 604-607
11.2.2 Action 1.3.1	Operations after May 14, 2012: Operate RBCO with Gates Out	Objective: 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 or 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 projects are constructed replace the loss of the diversion structure.	Reclamation shall operate p 604
11.2.2 Action 1.3.2	Winter Operations	Objective: 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 or 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 projects are constructed replace the loss of the diversion structure.	Reclamation shall operate p 604
11.2.2 Action 1.3.3	Winter Operations for Green Sturgeon	Objective: Allow passage of green sturgeon during winter operations.	Reclamation shall retain p 605
11.2.2 Action 1.3.4	Measures to Compensate for Adverse Effects of Winter Operations on Green Sturgeon	Objective: Offset short-term effects to green sturgeon due to winter gate operations by investing in geographically specific research needed to determine green sturgeon life history and recovery needs.	Reclamation shall conduct p 605
11.2.2 Action 1.3.5	Measures to Compensate for Adverse Effects of Winter Operations on Spring-Run	Objective: Offset immediate short-term effects to spring-run from passage impediments of RBCO by restoring spring-run passage elsewhere in the Sacramento River system.	Reclamation shall provide p 606
11.2.2 Action 1.4	Willows through Operations	Objective: Enhance the ability to manage temperatures for anadromous fish below Delta Dam by operating Willows through in the manner that later conserve the dam's cold water pool for summer releases.	Reclamation shall remove p 606
11.2.2 Action 1.5	Fencing for CWP/Awareness Fish Screen Program (AFSP)	Objective: To reduce entrainment of juvenile anadromous fish from unscreened diversions.	Reclamation shall screen p 607
11.2.2 Action 1.6	Lower American River Flow Management	Objective: To provide minimum flows for all steelhead life stages.	Reclamation shall increase p 613
11.2.2 Action 1.7	Lower American River Temperature Management	Objective: Monitor suitable temperatures to support out-migrant nesting of juvenile steelhead in the lower American River.	Reclamation shall increase p 614
11.2.2 Action 1.8	Structural improvements	Objective: Improve the ability to manage the cold water pool to provide suitable temperatures for better fish through physical and structural improvements at the dams.	Reclamation shall evaluate p 615
11.2.2 Action 1.9	Maintain Fish Habitat Effect	Objective: Reduce stranding and isolation of juvenile steelhead through ramping protocols.	Reclamation shall coordinate p 617
11.2.2 Action 1.10	Fish Passage at Nimbus and Fishon Dams	Objective: Provide passage for steelhead to Nimbus cold water habitat above Nimbus and Fishon dams.	Based on Location this is a USERR BOP
11.2.2 Action 1.11 (State)	Implement the Following Actions to Reduce Genetic Effects of Nimbus and Trinity River Fish Hatchery Operations	The following actions are classified to offset project effects related to Nimbus Fish Hatchery by reducing integration 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 (Garcia and Puentes 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.	See subsections for language p 618
11.2.2 Action 1.11.1	Preparation of Hatchery Genetic Management Plan (HGMP) for Steelhead	Objective of Actions 1.11.1-1.11.3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing integration 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 (Garcia and Puentes 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 1.11.2	Inform Actions Prior to Submittal of Draft HGMP for Steelhead	Objective of Actions 1.11.1-1.11.3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing integration 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 (Garcia and Puentes 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 1.11.3	Develop and Implement Fall-run Chinook Salmon Hatchery Management Plans for Nimbus and Trinity River Fish Hatcheries	Objective of Actions 1.11.1-1.11.3: The following actions are identified to offset project effects related to Nimbus Fish Hatchery by reducing integration 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 (Garcia and Puentes 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 1.12.1	Establish Staircase Operations Group for Real-Time Operational Decisions Meeting as Described in These Actions and Implementation Procedures	Objective: None Listed.	Reclamation shall create p 620
11.2.2 Action 1.12.2	Provide Cold Water Releases to Maintain Suitable Steelhead Temperature	Objective: None Listed.	Reclamation shall manage p 620
11.2.2 Action 1.12.3	Operate the End Side Diversion 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-enhancing geomorphic flows in a flow pattern that will provide migratory cues to smolt and facilitate out-migrant smolt movement on declining levels of pools.	Reclamation shall operate p 622
11.2.2 Action 1.12.4 (State)	Sacramento River CV Steelhead Habitat Restoration Operations	Overall objective: Dam operations have and will continue to suppress channel-forming flows that optimally opening depths. The physical presence of the dams impedes natural sediment transport processes. This action is necessary to partially offset adverse modification of steelhead critical habitat from operations.	Based on Location this is a USERR BOP
11.2.2 Action 1.12.5	Increase and Improve Quality of Spawning Habitat with Addition of 50,000 Cubic Yards of Gravel by 2014 and with a Minimum Addition of 6,000 Cubic Yards per Year for the Duration of the Project Action	Objective: None Listed.	Reclamation shall invest in p 626
11.2.2 Action 1.12.6	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 1.12.7	Remove 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 the action is to improve habitat quality of freshwater migratory habitat for juvenile steelhead.	Reclamation shall develop p 627
11.2.2 Action 1.12.8	Enhance Fish Passage at New Melones, Tulloch, and Goodwin Dams	Objective: Evaluate measures for steelhead to historic cold water habitat above New Melones, Tulloch, and Goodwin dams.	Based on Location this is a USERR BOP
11.2.2 Action 1.12.9	Tracy Fish Collection Facility (TFCC) Improvements to Reduce Pre-Screen Loss and Increase Screening Efficiency	Objective: Implement specific measures to reduce pre-screen loss and improve screening efficiency at Federal facilities. Action: Reclamation shall undertake the following action at the TFCC 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 methods (e.g., electrically sound, light, CO2) leading to the primary lower screens with the goal of reducing predation loss to less than 10 percent of loss. 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 10 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 TFCC. In the event that a solution acceptable to NMFS is not in place by June 2, 2011, cleaning at the Tracy Pumping Plant shall cease during lower cleaning and maintenance operations to avoid loss of fish during these actions. d) By December 31, 2011, Reclamation shall implement operational procedures to optimize the simultaneous salvage of juvenile salmonids and Delta smelt at the facility. e) Immediately upon issuance of the 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 use of infrared or low light charged coupled device camera or acoustic beam camera mounted within the secondary channel. f) Reclamation shall operate the facility to meet design criteria for lower bypasses and channel flows at least 75 percent efficiency. g) 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. h) 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. Devises that meet design flow criteria shall initiate immediate corrective measures to remedy deficiencies and return channel flows to design flow specifications.	Reclamation shall complete / submit p 634
11.2.2 Action 1.13.1	Long-Term Funding and Support for the Interagency Fish Passage Steering Committee	1) 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 635
11.2.2 Action 1.13.2 (State)	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 635
11.2.2 Action 1.13.3	Construction and Maintenance of Adult and Juvenile Fish Passage Facilities	Continued 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 Sacramento River depending on results of study provided for in Action 1.13.4.	with the assistance of the Steering Committee, Reclamation shall conduct p 637
11.2.2 Action 1.13.4	Development of Supplemental and Management Plan	develop and implement a long-term population supplementation plan for each species and fish passage location identified in 1.13.	with the assistance of the Steering Committee, in coordination with the NMFS Southwest Fishery Science Center, Reclamation shall develop and implement p 637

11.2.2 Action V: LF 23	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 24	Development of Fish Passage Monitoring and Evaluation Plan	Development of Fish Passage Monitoring and Evaluation Plan Objective: none listed	5 check with District if items are listed
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 681
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 681
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 682
11.2.2 Action V: NF 4	Implementation of Pilot Production Program	Objective: To implement short-term fish passage actions that will inform the strategy for long-term passage actions.	Reclamation shall begin to implement p 684
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 684 Reclamation shall provide p 685
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.	Reclamation shall implement p 685
11.2.2 Action V: NF 4.3	Capture, Trapping, and Release of Adults	NMFS considers vertical 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 685
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 the 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 emigration period, modification of reservoir refill rates, and using outlets, spillways, and spillways that typically are not opened to pass outflow.	Reclamation shall carry out interim operational measures p 686
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 pool-spawn steelhead is a critical component to the success of the Fish Passage Program.	Reclamation shall plan, design, build, and evaluate p 686
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 687
11.2.2 Action V: NF 4.7	Statistical River Fish Passage Assessment	Objective: To develop information needed in order to evaluate options for achieving fish passage on the Stanislaus River above Goodwin, Talbot, and New Melroe Dams.	Reclamation shall develop a study p 687
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 688
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. 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.	Reclamation shall seek p 761
13.3 (3)	Reasonable and Prudent Measures	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 seek to develop an alternative technique to quantify incidental take of listed anadromous salmonid species at the Federal and State export facilities. 4. 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 recommended technique, 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 item 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 763
13.4 (2 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-Ghay Hole (i.e., non-flood control) releases from Whiskeytown Reservoir according to the table below (estimated at RW 3.62). Ramping rates for releases greater than 200 cfs shall be much 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 projected status of vulnerable fish, the amount of water spilled, and existing 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 process of the outlet works or the City of Redding powerplant. b. During periods outside of flood control operations and to the extent cost-effective 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 cost-effective during flood control operations, Reclamation shall ramp releases in the Stanislaus River below Goodwin Dam as follows:	Reclamation shall minimize / schedule / ramp p 763, 764
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 finds the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation: 1. In preparing the SRNRP for a future section 7 consultation, Reclamation should first ensure that Stanislaus Reservoir storage and cold water pool requirements are met, as provided in RPA Action 1.2.2, and that all consultation-related and operational aspects of the SRNRP, both upstream and in the Delta, are analyzed in consideration of the conditions and effects on listed species and critical habitats of the CVP and SWP that were analyzed in this consultation.	Reclamation should first ensure p 766
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 finds the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation: 2. Reclamation should continue to fund CALFED ERP restoration actions, consistent with previous commitment and funding levels, and to fund CALFED ROD commitments. DWR should support continued state funding to CDFG to further implementation of the CALFED ERP.	Reclamation should continue p 766
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 finds the following conservation recommendations are consistent with these obligations, and therefore, should be implemented by Reclamation: 3. Reclamation should conduct studies to determine the economic feasibility and extent of biological benefits to listed species and critical habitats of completely removing the RSDO from the Sacramento River.	Reclamation should conduct p 768

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REMIT TAC 1	Reasonable and Prudent Measures: Minimize adverse effects of the operations of the Permanent Operable Gates	<p>Re 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 DCP requirements associated with that facility to be a joint USBR/DWR responsibility.</p> <p>Per Derrick BTD: 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>TAC 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 nondelegatory. 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> <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>	Reclamation shall ensure compliance with the following terms and conditions" in 294
RPM 4 TAC 4	Reasonable and Prudent Measures: Minimize adverse effects of Banks and Jones on delta smelt		
Grand Total			

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AGREEMENT

to address

THE EFFECTS OF THE CALIFORNIA WATERFIX ON CENTRAL VALLEY PROJECT OPERATIONS

by and between

THE UNITED STATES BUREAU OF RECLAMATION

and

THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

This Agreement is entered into this 12th day of DECEMBER, 2018 by and between the UNITED STATES BUREAU OF RECLAMATION ("Reclamation") and the CALIFORNIA DEPARTMENT OF WATER RESOURCES ("DWR"), collectively the "Parties."

EXPLANATORY RECITALS

The Parties have entered into this Agreement in consideration of the following facts:

Reclamation is a federal agency within the United States Department of the Interior charged with constructing, operating, and maintaining the CVP.

DWR is a state agency within the California Natural Resources Agency responsible for constructing, operating, and maintaining the SWP.

DWR and Reclamation submitted the joint petition to add points of diversion for the State Water Project "SWP" and Central Valley Project "CVP" to the California State Water Resources Control Board ("State Water Board") for the California WaterFix ("CWF Change Petition").

Reclamation submitted a revised project description for the CWF Biological Assessment to U.S. Fish and Wildlife Service ("USFWS") and National Marine Fisheries Service ("NMFS") on May 24, 2017. On June 2, 2017, Reclamation provided correspondence to USFWS and NMFS identifying the May 24, 2017, package of changes to the project description as the final proposed action for consultation.

CWF is described in the final Environmental Impact Report/Environmental Impact Statement ("EIR/EIS"), and DWR approved its Final Environmental Impact Report ("FEIR"), State Clearinghouse No. 2008032062, as later amended by 'Developments After Publication of the Proposed FEIR July 2017,' and as may be amended and supplemented from time to time, as well as applicable permits and authorizations such as the 2017 CWF Biological Opinions, and the 2017 CWF California Endangered Species Act Incidental Take Permit ("CESA ITP").

Reclamation has not accepted the 2017 CWF Biological Opinions or issued a CWF Record of Decision (“ROD”) but will consider doing so once the State Water Resources Control Board issues an order on the CWF Change Petition.

Given the coordinated nature of CVP and SWP operations, the addition of the CWF project to the SWP may affect the CVP.

DWR and Reclamation desire to establish the terms and conditions under which Reclamation will agree to maintain the CWF Change Petition, pending before the State Water Resources Control Board, by memorializing the Parties’ agreement that DWR will avoid, mitigate or offset CWF impacts, if any, described herein under specified circumstances.

The Parties covenant and agree as follows:

1.0 AUTHORITIES

1.1 Bureau of Reclamation

Reclamation constructed, operates, and maintains the CVP as authorized by the Act of August 26, 1937 (50 Stat. 850), and all acts amendatory or supplemental thereto including but not limited to, the First Deficiency Appropriation Act, Fiscal Year 1936 (49 Stat. 1622); the Act of October 17, 1940 (54 Stat. 1198, 1199); the Act of December 22, 1944 (58 Stat. 887); the Act of October 14, 1949 (63 Stat. 852); the Act of September 26, 1950 (64 Stat. 1036); the Act of August 27, 1954 (68 Stat. 879); the Act of August 12, 1955 (69 Stat. 719); the Act of June 3, 1960 (74 Stat. 156); the Act of October 23, 1962 (76 Stat. 1173); the Act of September 2, 1965 (79 Stat. 615); the Act of August 19, 1967 (81 Stat. 167); the Act of August 27, 1967 (81 Stat. 173); the Act of October 23, 1970 (84 Stat. 1097); the Act of September 28, 1976 (90 Stat. 1324); the Act of December 22, 1980 (94 Stat. 3339); the Act of October 27, 1986 (100 Stat. 3050); the Central Valley Project Improvement Act (106 Stat. 4706); the Act of November 5, 1990 (104 Stat. 2074); the San Joaquin River Restoration Settlement Act (123 Stat. 1349, Title X); and the Water Infrastructure Improvements for the Nation Act (130 Stat. 1628, Title III, Subtitle J).

1.2 Department of Water Resources

DWR is authorized under the State Central Valley Project Act (Water Code section 11100, et seq.), Burns-Porter Act (California Water Resources Development Bond Act), State Contract Act (Public Contract Code section 10100, et seq.), Davis-Dolwig Act (Water Code sections 11900-11925), and other acts of the State Legislature and applicable laws of the State of California to construct, operate, and maintain the SWP.

2.0 EFFECTIVE DATE

This Agreement shall become effective upon signature of the Parties and shall remain in full force and effect until terminated pursuant to Article 4.0, below (**TERMINATION**).

3.0 TERMS AND CONDITIONS

3.1 Reclamation shall maintain the CWF Change Petition at least until either a draft order is issued or the State Water Resources Control Board has announced an intention to issue a final order without circulation of a draft order; provided, nothing herein shall affect Reclamation's discretion whether or how to prepare or adopt a CWF ROD.

3.2 In the event the CWF facilities are not fully integrated with the annual and daily operations of the CVP by Reclamation for multiple CVP purposes, the State, through DWR, shall avoid, mitigate, or offset, through forms agreed to by Reclamation, any CVP water supply reduction resulting from CWF operations or restrictions imposed on the CVP through permits or other regulatory approvals issued for CWF operations for the mitigation or avoidance of biological impacts attributable directly to CWF operations.

The existence and extent of any CVP water supply reduction from CWF will be assessed at the time that any new regulatory requirement or permit issued for CWF affects operations of the CWF or CVP. CVP water supply reductions due to subsequent modifications to the Sacramento/San Joaquin Bay-Delta Estuary Water Quality Control Plan will not impose on the State an avoidance, mitigation, or offset obligation unless those subsequent modifications are for mitigation or avoidance of biological impacts directly attributable to CWF operations. Reclamation and DWR will assess any order approving a change in the point of diversion and re-diversion for the CWF, to determine if appropriate flow criteria imposed pursuant thereto were imposed to mitigate or avoid biological impacts attributable directly to CWF operations. The Parties agree to establish a process for conducting the assessments.

4.0 TERMINATION OF AGREEMENT

This Agreement may be terminated: (1) upon mutual written consent of the Parties, or (2) automatically if (a) Reclamation ceases to pursue the CWF Change Petition prior to the Board's issuance of a final order regarding such petition, or (b) DWR does not accept the final order issued by the State Water Resources Control Board on the CWF Change Petition.

5.0 MISCELLANEOUS PROVISIONS

5.1 Relation to Agreement between the United States of America and the State of California for Coordinated Operation of the CVP and SWP

Nothing in this Agreement shall: (1) affect any review by the United States and the State of the Agreement between the United States of America and the State of California for Coordinated Operation of the CVP and SWP ("COA"), or (2) alter, modify, or amend any provision of COA, or relieve either Party to the COA of any obligations or rights it may have under COA.

5.2 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.

5.3 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 judicial, executive or legislative branch action, 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.

5.4 Anti-Deficiency Act

The Federal agency obligations described in this Agreement are contingent on appropriations. No liability shall accrue to the United States or Federal agencies in the event funds are not appropriated or allotted.

5.5 Elected Officials Not to Benefit

This Agreement shall not provide any benefit for any elected official.

5.6 Integration and Amendment

This Agreement represents the entire understanding and agreement of the Parties with respect to the subject matter hereof. This Agreement may only be amended in-writing with the prior mutual written consent of the Parties.

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

CALIFORNIA DEPARTMENT OF


Karla Nemeth, Director

**UNITED STATES BUREAU OF
RECLAMATION**


Brenda Burman, Commissioner

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
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December 12, 2018

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American River Water Agencies Group
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Dear Messrs. Bettner, Sutton, Peifer, Fecko, Bair, O'Brien, Bezerra, Coate, Ortega and White:

In recognition of the efforts by California to work collaboratively with the many parties involved in crafting solutions to help manage water resources, and to further our common goals of improving water supply reliability in California and to the protection, restoration, and enhancement of the Sacramento River and San Joaquin River watersheds and Delta ecosystem, the California Department of Water Resources memorializes here the expectation for actions by the various parties in recognition of the Addendum to the Coordinated Operations Agreement and the agreement reached with USBR regarding California WaterFix.

It is the State's expectation that the parties benefitting from the Addendum to the Coordinated Operations Agreement will take the following actions:

Withdraw all protests from the water rights proceeding pending before the State Water Resources Control Board, and refrain from filing protests or lawsuits at any point in the future for water rights processes associated with the California WaterFix;

Refrain from any challenge to, and withdraw from pending litigation over, the California WaterFix compliance with provisions of both the federal Endangered Species Act and California Endangered Species Act;

Refrain from any challenge to compliance with the 2009 Delta Reform Act or actions by the Delta Stewardship Council associated with the construction or operation of the California WaterFix;

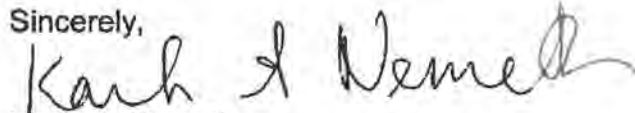
Refrain from any challenge to, and withdraw from pending litigation over, the California WaterFix compliance with provisions of the California Environmental Quality Act and National Environmental Policy Act;

Refrain from any challenge to, and withdraw from pending litigation over, any State Water Project contract amendments; and,

Refrain from any challenge to, and withdraw from pending litigation over, any validation lawsuit filed in relation to the State Water Project as it may relate to the California WaterFix.

As we move forward, I look to you to continue to honor your commitment made in the course of our discussions, and expect your full cooperation in the actions listed above. These are important and necessary steps in continuing to have productive partnerships in managing our limited water resources.

Sincerely,

A handwritten signature in black ink, appearing to read "Karla A. Nemeth". The signature is fluid and cursive, with the first name "Karla" being more prominent.

Karla A. Nemeth
Director