

AGREEMENT BETWEEN
THE DEPARTMENT OF WATER RESOURCES AND
THE DEPARTMENT OF FISH AND GAME
REGARDING IMPLEMENTATION OF A FISH RESTORATION PROGRAM IN
SATISFACTION OF FEDERAL BIOLOGICAL OPINIONS FOR
STATE WATER PROJECT DELTA OPERATIONS

This Agreement is made on October 18, 2010 between the Department of Water Resources (DWR) and the Department of Fish and Game (DFG) regarding implementation of a fish restoration program through creation or restoration of fish habitat or other activities in satisfaction of requirements in the 2008 U.S. Fish and Wildlife Service (USFWS) Biological Opinion for Delta Smelt; the 2009 National Marine Fisheries Service (NMFS) Biological Opinion for Salmonids, Green Sturgeon and Killer Whales for the Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP); and the Longfin Smelt Incidental Take Permit for SWP operations, hereafter referred to as the "Fish Restoration Program."

RECITALS

- A. On December 15, 2008, the USFWS issued a Biological Opinion on Delta Smelt and the Coordinated Operations of the CVP and SWP (Delta Smelt BiOp). The Delta Smelt BiOp includes a Reasonable and Prudent Alternative (RPA) requiring changes in CVP and SWP operations necessary to prevent jeopardy to the continued existence of delta smelt. By December 15, 2019, the Delta Smelt BiOp RPA, Component 4, requires that DWR complete a program to create or restore a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh and to develop management plans, monitoring, and financial assurances for the restoration sites developed in satisfaction of the RPA. (Delta Smelt BiOp p. 283-284; see also BiOp Attachment B, Action 6 further describing the RPA.) DWR desires, through this Agreement, to address procedures pursuant to which DFG will assist DWR in satisfying this requirement. A copy of the RPA Component 4, including Attachment B Action 6, is attached to this Agreement as Attachment 1.
- B. On June 4, 2009, the NMFS issued a Biological Opinion on Salmonids, Green Sturgeon, and Killer Whales for the Long-term Operations of the CVP and SWP (Salmon BiOp). The Salmon BiOp includes a Reasonable and Prudent Alternative (RPA) requiring changes in CVP and SWP operations necessary to prevent jeopardy to the continued existence of winter-run Chinook salmon, spring-run Chinook salmon, steelhead, sturgeon, and killer whales. The Salmon BiOp RPA provides for mitigation through various actions by DWR and U.S. Bureau of Reclamation (Reclamation) to address impacts to salmonids. Actions that DWR desires to address through this Agreement are funding restoration actions on Battle Creek (Action I.2.6, Salmon BiOp p. 603) and restoring floodplain rearing habitat for

salmonids in the lower Sacramento River basin (e.g., Liberty Island/Lower Cache Slough) in cooperation with DFG, USFWS, NMFS, and the U.S. Army Corps (Action Suite I.6, Salmon BiOp p. 607-10). For Action I.6.1, if the 8,000 acres of tidal habitat in the Delta Smelt BiOp RPA Component 4 also provides suitable rearing habitat for salmonids, these acres may be used in partial satisfaction of Action I.6.1 (Salmon BiOp p. 609). DWR further desires, through this Agreement, to address procedures pursuant to which DFG will assist DWR in satisfying the requirements in the Salmon BiOp. A copy of the Salmon BiOp Actions I.2.6 and Suite I.6 are attached to this Agreement as Attachment 2.

- C. On July 16, 2009, based upon a request from DWR, DFG found the Delta Smelt BiOp is consistent with the California Endangered Species Act (CESA) for the authorization of take of delta smelt by the SWP.
- D. On September 3, 2009, based upon a request from DWR, DFG found the Salmon BiOp is consistent with CESA for the authorization of take of, winter-run Chinook salmon and spring-run Chinook salmon by the SWP. On May 26, 2010, DFG issued a replacement consistency determination for the Salmon BiOp.
- E. On February 23, 2009, DWR received from DFG incidental take authorization of longfin smelt for the SWP operations pursuant to section 2081 of the Fish and Game Code (SWP Longfin Smelt Incidental Take Permit (ITP No. 2081-2009-001-3)). The SWP Longfin Smelt ITP Condition 7 requires that DWR improve the overall habitat quality for longfin smelt in the Bay Delta Estuary through acquisition, restoration, long-term management and monitoring of 800 acres of intertidal and associated sub-tidal wetland habitat in a mesohaline part of the estuary. (Longfin Smelt ITP p. 14-15, 17-18.) DFG and DWR intend that restoration of habitat in compliance with the Delta Smelt BiOp that also meets the criteria of the Longfin Smelt ITP will satisfy requirements of the ITP. A copy of the Longfin Smelt ITP Condition 7 is attached to this Agreement as Attachment 3.
- F. On October 6, 2006, DWR and DFG, along with the California Natural Resources Agency, Reclamation, USFWS, NMFS, seven water agencies and other Delta water users, and four non-governmental organizations, signed the Bay Delta Conservation Plan (BDCP) Planning Agreement. The BDCP is anticipated to provide Federal Endangered Species Act (FESA) and CESA compliance for coordinated SWP and CVP operations in the Sacramento-San Joaquin River Delta through a Habitat Conservation Plan (FESA Section 10), Biological Opinions (FESA Section 7), and a Natural Community Conservation Plan (NCCP) (Fish and Game Code Section 2800 et seq.). Consistent with the NCCP Act, FESA and CESA, the Planning Agreement recognizes that the Agreement parties can elect to preserve, enhance, or restore, either by acquisition or other means, aquatic and associated riparian and floodplain habitat in the Planning Area that support native species of fish, wildlife, or natural communities prior to approval of the BDCP" and that "the Fishery Agencies agree to credit such resources toward the land and water acquisition or habitat protection, enhancement, and restoration requirements of the BDCP, as appropriate, provided

these resources are appropriately conserved, restored or enhanced, and managed and contribute to the BDCP's conservation strategy." (Planning Agreement Section 7.7.1, p. 18.) DFG and DWR intend that actions carried out to meet the requirements in the Delta Smelt BiOp, Salmon BiOp, and the Longfin Smelt ITP will also be credited towards satisfaction of the habitat restoration conservation measures of the BDCP.

- G. On November 12, 2009, the Delta Reform Act (Act) was signed into law by Governor Schwarzenegger. The Act creates a new agency, the Delta Stewardship Council, to implement the coequal goals of providing a more reliable water supply and protecting, restoring and enhancing the Delta ecosystem. The Council is required to adopt a Delta Plan by January 1, 2012. The Act also designates the Delta Conservancy as the primary state agency for implementation of ecosystem restoration. DFG and DWR intend to communicate with the Delta Stewardship Council and the Delta Conservancy to ensure actions taken pursuant to this Agreement are consistent with the Act and the Delta Plan when it is adopted.
- H. On December 30, 1986, DWR and DFG entered into the "Agreement Between The Department Of Water Resources And The Department Of Fish And Game To Offset Direct Losses In Relation To The Harvey O. Banks Delta Pumping Plant" (known as the "Delta Fish Agreement"). DWR and DFG intend to continue implementation of the Delta Fish Agreement. This Agreement is not intended to modify or otherwise affect the Delta Fish Agreement.
- I. DWR and DFG intend through this Agreement to develop a fish restoration program by establishing the framework for selecting, funding, and implementing specific restoration projects, and management and funding plans for those same restoration projects. The commitment of specific funding for and implementation of the restoration actions or other activities will be made by DWR through execution of subsequent agreements with other entities, such as, if appropriate, DFG, USFWS, and NMFS. At the time of execution of this Agreement, the project proposals specifically identified for restoration required by the federal BiOps and the Longfin Smelt ITP are not well enough defined as to their location, specific land modification, or restoration requirements to provide meaningful information for environmental assessment. Therefore, at this time environmental analysis of any restoration proposals or other activities referred to in this Agreement would be premature. In addition, execution of this Agreement will not effectively preclude any alternatives or mitigation measures that CEQA would otherwise require to be considered, including the alternative of not going forward with a restoration proposal, if a project were to be found infeasible or to have unacceptable impacts on the environment such that other alternatives or mitigation may be considered. Thus, prior to project implementation, DWR and DFG commit through this Agreement to satisfy CEQA requirements for restoration proposals at the time when sufficient information is available for meaningful analysis of the restoration proposals or actions referred to herein.

Now therefore, in accordance with the Recitals and in consideration of the terms and conditions herein, DWR and DFG agree to the following:

A. Fish Restoration Program.

1. This Agreement commits DFG to work cooperatively with and assist DWR to establish the management and financial framework necessary to implement a fish restoration program that will satisfy DWR's obligations under the Delta Smelt BiOp RPA Component 4 identified above in Recital A, Salmon BiOp RPA Actions I.2.6 and Suite I.6 identified above in Recital B, and the Longfin Smelt ITP Condition 7 identified above in Recital E.
2. Consistent with the BDCP Planning Agreement, the restoration proposals or actions described above in section A.1 and established by this Agreement to cover impacts of SWP operations as described in the Delta Smelt BiOp, the Salmon BiOp, and the Longfin Smelt ITP will contribute to meeting the habitat acreage required of, and funded by, DWR for BDCP as tidal and associated subtidal habitat and other appropriate habitat acreage conservation measure targets identified in the BDCP. Prior to committing to any specific restoration actions, DWR, in cooperation with DFG, will submit the restoration proposals developed through this Agreement to USFWS and NMFS to obtain their review and written concurrence that the restoration proposals would satisfy requirements of their respective biological opinions and the BDCP for fish restoration.
3. Fish restoration requirements for the Delta Smelt BiOp RPA Component 4, Salmon BiOp RPA Actions I.2.6 and Suite I.6, and the Longfin Smelt ITP Condition 7 may be met by the following:
 - a. Creation or restoration of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh. Some potential actions and estimated funding to provide this restoration acreage are described in Attachment 4, "Proposed Agreement Commitments and Estimated Costs." Attachment 4 is not a final or binding list of actions and may be modified by DWR and DFG from time to time as additional information is developed.
 - b. Implementation of Delta Smelt BiOp RPA Component 4 fish habitat restoration. Prior to committing to a specific project proposal or restoration action, DWR, in cooperation with DFG, shall submit the fish restoration proposal to USFWS to obtain USFWS review and written approval of the project proposal as satisfying the habitat restoration conditions required in the Delta Smelt BiOp.
 - c. Implementation of Salmon BiOp RPA fish habitat restoration actions. Prior to committing to a specific project proposal or restoration action for salmon, DWR, in cooperation with DFG, shall submit the fish restoration proposal to NMFS to obtain NMFS review and written approval of the project proposal as

satisfying the habitat restoration conditions required in the Salmon BiOp. The restoration actions that satisfy the Delta Smelt BiOp may be accepted by NMFS in satisfying restoration obligations of Salmon BiOp RPA Action I.6.1.

- d. Implementation of Longfin Smelt habitat restoration actions. The 800 acres of habitat restoration required in Condition 7 in the Longfin Smelt ITP will be satisfied upon DWR satisfying 800 acres of habitat restoration under the Delta Smelt BiOp in the mesohaline zone of the Delta (in Suisun Bay or Marsh) with hydrologic connectivity to open waters. Prior to committing to a specific project proposal or action, DFG and DWR shall agree in writing that the proposed project satisfies Condition 7 of the Longfin Smelt ITP.
4. The proposed fish restoration projects will be selected by DWR, with assistance from and in cooperation with DFG, after coordinating and obtaining appropriate approval from USFWS, and NMFS, and DFG, as provided in Section 3 above. Restoration plans for those selected habitat enhancement projects will be implemented through specific implementation agreements that provide for compliance with all permitting and regulatory requirements.
5. This Agreement shall not restrict DWR's right to delegate to, contract with, or carry out cooperative programs with other public agencies or appropriate entities to plan or implement all or any part of a habitat restoration action for purposes of satisfying the Delta Smelt BiOp, Salmon BiOp, or Longfin Smelt ITP. For purposes of this Agreement, implementation by such an entity will be deemed to be implementation by DWR and all crediting provisions of this Agreement shall be applicable to such restoration actions if implemented in accordance with this Agreement and a project specific implementation agreement as described in Section 4. To the extent that any activity covered by this Agreement is carried out by such an entity, DWR will ensure that the planning is carried out with DFG's participation and assistance as provided for herein.

B. Implementation Schedule. Without delay, and no later than twelve (12) months from the effective date of this Agreement, DWR, with assistance from DFG, shall develop a schedule for a fish restoration program through the creation or restoration of fish habitat or other activities (Implementation Schedule). The Implementation Schedule will identify restoration actions, estimated costs, targeted acreage, and a timeline for DWR's implementation of restoration proposals or actions for purposes of satisfying DWR's obligations under the Delta Smelt BiOp, Salmon BiOp, and Longfin Smelt ITP.

C. CEQA. DWR, and if applicable DFG or any other entity, will comply with CEQA prior to implementing the restoration projects called for under this Agreement. DWR will serve as lead agency and DFG as responsible agency unless circumstances require that a different lead agency and responsible agency be used. DWR will be responsible for all DWR and DFG costs associated with CEQA compliance of

restoration projects called for under this Agreement and as provided under Section E below.

D. Identification, Monitoring, Evaluation, Review, and Approvals. DWR, with assistance from DFG and other entities, if appropriate, will develop a process for determining whether a proposed restoration project should be selected for purposes of satisfying DWR obligations under the Delta Smelt BiOp, the Salmon BiOp, and Longfin Smelt ITP and obtaining habitat restoration credit.

E. Funding. Plans for individual restoration projects shall include DWR funding sufficient to accomplish full implementation of the action, which may include, but is not limited to, restoration planning, environmental review and documentation, permitting, interim management prior to restoration, restoration implementation, operation and maintenance activities, and monitoring to evaluate project success in meeting the planned restoration objectives. DWR funding will cover DFG incurred costs necessary to assist in planning and implementing the action.

F. Commitments and Financing.

1. Starting in year one and continuing for each year thereafter DWR will provide funding for DFG staff to assist DWR in its planning activities and to monitor and review DWR's implementation of the activities described above in Section E, in this Section F, and in Section H below, as well as supporting operational decision-making associated with avoidance and minimization measures required under the Delta Smelt BiOp, Salmon BiOp, and Longfin Smelt ITP (See Attachment 4).
2. For meeting the objectives of this Agreement, DWR will fund DFG's staffing costs to assist DWR in planning and implementing restoration proposals including, but not limited to, tracking the Implementation Schedule, negotiating land transfer agreements, managing transferred lands, assessing and evaluating results, and helping develop adaptive management plans (See Attachment 4). DWR and DFG will mutually agree on the tasks and level of effort to be performed by DFG. DFG will submit a 3-year budget plan with tasks and costs annually to be reviewed, modified if necessary, and approved by DWR each year. The annual budget will also include detailed tasks conducted by DFG, staff hours and costs. DFG will also prepare timely quarterly reports to DWR on its tasks, staff hours and costs for review by DWR.
3. A phased approach will be used for funding and implementation of actions as set forth below:

3.1. Year One Commitments and Financing.

In order to immediately start to restore habitats needed to ensure sufficient production, spawning and rearing for fish species covered under the Delta Smelt

and Salmon BiOps and Longfin Smelt ITP, during Year One DWR will fund, plan, and implement to the extent practicable, those actions specified in Attachment 4, or equivalent actions, to the extent required to meet DWR's obligations under the BiOps and the ITP. The \$12 million funding commitment towards Battle Creek restoration will be satisfied by a one-time up-front payment to Reclamation for this purpose when requested in writing by DFG.

3.2. Year Two through Ten Commitments and Financing.

In Years Two through Ten, or until all restoration actions required under the Delta Smelt and Salmon BiOps and Longfin Smelt ITP have been fully implemented, DWR and DFG will work together to initiate or continue implementation of the restoration actions. To accomplish this, DWR will:

- a. Initiate or continue restoration or creation of a total of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh. DWR intends to achieve this by securing and initiating implementation of 35% of the total acreage by year four, 60% by year six, 80% by year eight and 100% by year ten, or as otherwise provided by Section F.3.1. above, and diligently pursuing implementation to completion. DWR, USFWS, NMFS, and DFG may agree on other mitigation actions for meeting the required amount of acreage.
- b. DWR and DFG recognize that the BDCP may become effective prior to the time when all restoration actions described in this Agreement have been completed. Therefore, this Agreement shall guide the planning for habitat restoration actions related to the existing Delta Smelt and Salmon BiOps and the Longfin Smelt ITP until the BDCP and its associated biological opinions and incidental take permits become effective, at which time DWR and DFG intend that this Agreement would terminate and the BDCP documents and the BDCP Implementation Agreement would guide all subsequent habitat restoration processes.
- c. Should unforeseen circumstances arise that render the timely implementation of these restoration actions infeasible, DWR, DFG, USFWS, and NMFS will meet and determine how to address the delay and any potential effects of the delay.

G. Acreage Credit. DWR will receive acreage credit for fish habitat restoration upon securing acreage designated for restoration and initiating implementation of the restoration proposals or actions consistent with the obligations under the Delta Smelt BiOp, Salmon BiOp, and Longfin Smelt ITP and as defined by a credit memo agreed upon with USFWS, NMFS, or DFG, as appropriate, in advance of taking any restoration actions.

H. Property Transfer and Management Costs. Property ownership and management details will be set forth in subsequent project specific agreements which will include

assurances for sufficient funding through DWR's SWP operations and maintenance budget for perpetual operation and maintenance (O&M) of the restoration project. Property acquired and restored pursuant to this Agreement for which title is not held by DFG will be protected with a Conservation Easement in favor of an entity approved by DFG, USFWS or NMFS or with an acceptable alternative instrument. Such property will be protected by a separate agreement for each site on terms that provide DFG, USFWS, or NMFS sufficient access and rights, as appropriate, to monitor and/or operate and maintain the property in accordance with the approved restoration plan for the site.

I. Reporting.

1. DWR, in coordination with DFG, shall prepare an annual report on programs and projects being implemented under this Agreement. The report will include financial reporting, the progress of each project towards meeting the intended restoration goals and Implementation Schedule, and the current status, barriers, and relative accrued benefits of those projects.
2. At year 5 and 8, and every 5 years subsequently, DWR, in coordination with DFG, will review and jointly prepare a report on the restoration actions implemented under this Agreement using monitoring data from the restoration actions implemented and current scientific understanding for the following purposes:
 - a. To assess the effectiveness of restoration actions undertaken and funding provided in achieving the expected benefits to the fish species covered in the restoration plan;
 - b. To evaluate the effectiveness of the restoration actions to collectively provide the expected benefits in relation to satisfying the obligations under the Delta Smelt BiOp, the Salmon BiOp, and the Longfin Smelt ITP.
3. The review of the restoration projects identified in this Agreement will follow a process that will be developed by DWR, in cooperation with DFG, USFWS, and NMFS and may be included in the implementation agreement for the specific project. Based upon the results of this review, implementation may be altered according to the Adaptive Management principles identified in the ERP Stage 2 Conservation Strategy for Suisun Marsh and the Delta, or as may be identified in the BDCP, or as may be developed by DWR in cooperation with DFG, USFWS, and NMFS.
4. DWR, in coordination with DFG shall submit their joint reports to USFWS and NMFS.

J. Substantial Changes. Should substantial changes in the Delta or new scientific information result in modifications to the Delta Smelt BiOp, Salmon BiOp or Longfin Smelt ITP under circumstances where the BDCP has not become effective, DWR

and DFG will meet and confer to determine what changes to this Agreement, if any, should be made to reflect the terms of the modified BiOps and/or ITP.


K. Withdrawal. Either DWR or DFG may withdraw from this Agreement with 60 days written notice. Such withdrawal shall not affect any project specific agreements entered into between DWR, DFG and/or other entities pursuant to this Agreement prior to the date of withdrawal.

L. Dispute Resolution. In the event a dispute arises out of any term or condition of this Agreement, DFG and DWR shall meet as soon as possible to resolve the dispute. DFG and DWR shall then attempt to negotiate a resolution of such dispute. Notwithstanding the above provision, neither DFG nor DWR waive any rights or duties it may have pursuant to federal and state laws, rules, or regulations.

M. Amendments. This Agreement may be amended by mutual written agreement of DWR and DFG.

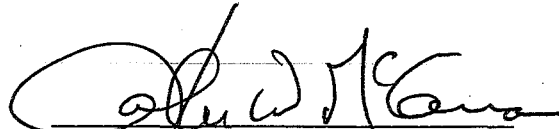
N. Headings. The paragraph headings in this Agreement have been inserted solely for convenience of reference and are not a part of this Agreement and shall have no effect upon its construction or interpretation.

O. Effective Date and Term. This Agreement shall become effective upon signatures below and shall continue except as otherwise provided herein.



Mark Cowin, Director
Department of Water Resources

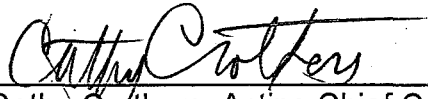
Date: 10/18/2010



John McCamman, Director
Department of Fish and Game

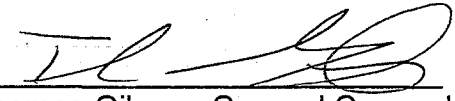
Date: 10/18/2010

Approved as to legal form and sufficiency:



Cathy Crothers, Acting Chief Counsel
Department of Water Resources

Date: Oct. 14, 2010



Thomas Gibson, General Counsel
Department of Fish and Game

Date: Oct 18, 2010

Attachments Incorporated into this Agreement by the references above:

1. Delta Smelt BiOp RPA Component 4
2. Salmon BiOp RPA Actions I.2.6 and Suite I.6
3. Longfin Smelt ITP Condition 7
4. Proposed Agreement Commitments and Estimated Costs

ATTACHMENTS 1, 2, AND 3

water year was wet or above normal as defined by the Sacramento Basin 40-30-30 index, all inflow into CVP/SWP reservoirs in the Sacramento Basin shall be added to reservoir releases in November to provide an additional increment of outflow from the Delta to augment Delta outflow up to the fall X2 of 74 km for Wet WYs or 81 km for Above Normal WYs, respectively. In the event there is an increase in storage during any November this action applies, the increase in reservoir storage shall be released in December to augment the December outflow requirements in SWRCB D-1641.

Given the nature of this Action and to align its management more closely with the general plan described by the independent review team and developed by Walters (1997), the Service shall oversee and direct the implementation of a formal adaptive management process. The adaptive management process shall include the elements as described in Attachment B. This adaptive management program shall be reviewed and approved by the Service in addition to other studies that are required for delta smelt. In accordance with the adaptive management plan, the Service will review new scientific information when provided and may make changes to the action when the best available scientific information warrants. For example, there may be other ways to achieve the biological goals of this action, such as a Delta outflow target, that will be evaluated as part of the study. This action may be modified by the Service consistent with the intention of this action based on information provided by the adaptive management program in consideration of the needs of other listed species. Other CVP/SWP obligations may also be considered.

The adaptive management program shall have specific implementation deadlines. The creation of the delta smelt habitat study group, initial habitat conceptual model review, formulation of performance measures, implementation of performance evaluation, and peer review of the performance measures and evaluation that are described in steps (1) through (3) of Attachment B shall be completed before September 2009. Additional studies addressing elements of the habitat conceptual model shall be formulated as soon as possible, promptly implemented, and reported as soon as complete.

The Service shall conduct a comprehensive review of the outcomes of the Action and the effectiveness of the adaptive management program ten years from the signing of the biological opinion, or sooner if circumstances warrant. This review shall entail an independent peer review of the Action. The purposes of the review shall be to evaluate the overall benefits of the Action and to evaluate the effectiveness of the adaptive management program. At the end of 10 years or sooner, this action, based on the peer review and Service determination as to its efficacy shall either be continued, modified or terminated.

RPA Component 4: Habitat Restoration

This component of the RPA (Action 6 of Attachment B) is intended to provide benefits to delta smelt habitat to supplement the benefits resulting from the flow actions described above. DWR shall implement a program to create or restore a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh. These actions

may require separate ESA consultations for their effects on federally listed species. The restoration efforts shall begin within 12 months of signature of this biological opinion and be completed by DWR (the applicant) within 10 years. The restoration sites and plans shall be reviewed and approved by the Service and be appropriate to improve habitat conditions for delta smelt. Management plans shall be developed for each restoration site with an endowment or other secure financial assurance and easement in place held by a third-party or DFG and approved by the Service. The endowment or other secure financial assurance shall be sufficient to fund the monitoring effort and operation and maintenance of the restoration site.

An overall monitoring program shall be developed to focus on the effectiveness of the restoration actions and provided to the Service for review within six months of signature of this biological opinion. The applicant shall finalize the establishment of the funding for the restoration plan within 120 days of final approval of the restoration program by the Service. There is a separate planning effort in Suisun Marsh where the Service is a co-lead with Reclamation on preparation of an Environmental Impact Statement. Restoration actions in Suisun Marsh shall be based on the Suisun Marsh Plan that is currently under development.

RPA Component 5: Monitoring and Reporting

Reclamation and DWR shall ensure that information is gathered and reported to ensure:

- 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.

Essential information to evaluate these actions (and the Incidental Take Statement) includes sampling of the FMWT, Spring Kodiak Trawl, 20-mm Survey, TNS and the Environmental Monitoring Program of the IEP. This information shall be provided to the Service within 14 days of collection. Additional monitoring and research will likely be required, as defined by the adaptive management process.

Information on salvage at Banks and Jones is both an essential trigger for some of these actions and an important performance measure of their effectiveness. In addition, information on OMR flows and concurrent measures of delta smelt distribution and salvage are essential to ensure that actions are implemented effectively. Such information shall be included in an annual report for the WY (October 1 to September 30) to the Service, provided no later than October 15 of each year, starting in 2010.

Reclamation shall implement the RPA based on performance standards, monitoring and evaluation of results from the actions undertaken and adaptive management as described in RPA component 3. RPA component 3 has a robust adaptive management component that requires a separate analysis apart from those required under this component. Some of the data needed for these performance measures are already being collected such as the FMWT abundances and salvage patterns. However, more information on the effect of

ACTION 6: HABITAT RESTORATION

Objective: To improve habitat conditions for delta smelt by enhancing food production and availability.

Action: A program to create or restore a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh shall be implemented. A monitoring program shall be developed to focus on the effectiveness of the restoration program.

Timing: The restoration efforts shall begin within 12 months of signature of this biological opinion and be completed within a 10 year period.

Background

The historic Delta was a tidal wetland-floodplain system including about 350,000 acres of tidal wetland. Almost all of the historic wetlands in the Delta have been lost due to conversion to agriculture and urban development. The Delta currently supports less than 10,000 acres of tidal wetland, all of which is small and fragmented. This conversion of the Delta's wetlands beginning in the mid-nineteenth century has resulted in a landscape dominated by agricultural lands intersected by deep and comparatively uniform tidal channels.

Delta smelt feed mainly on zooplankton throughout their life cycle (Nobriga and Herbold 2008) with the copepod *Pseudodiaptomus forbesi* being the dominant prey item for juvenile delta smelt in the summer (Lott 1998; Nobriga 2002; Hobbs et al. 2006). Diatoms form the base of the pelagic foodweb and primary consumers (e.g. copepods) appear to be food-limited in the Delta and Suisun (Muller-Solger et al. 2002; Sobczak et al. 2002). Pelagic productivity in the Delta and Suisun Bay has been declining for several decades with a steep decline following the introduction of the overbite clam in 1986 (Kimmerer and Orsi 1996). Histopathological evaluations have provided evidence that delta smelt have been food-limited during the summer months (Bennett 2005). This finding has been corroborated by recent work on juvenile delta smelt as part of ongoing studies on the POD. Moreover, recent studies suggest a statistical association between delta smelt survival and the biomass of copepods in the estuary (Kimmerer 2008).

Overall research in other estuaries has indicated that tidal wetlands are highly productive. Although definitive studies have not been done on the type and amount of productivity in freshwater tidal wetlands of the Delta, brackish tidal wetlands of Suisun Marsh are one of the most productive habitats in northern San Francisco Bay-Delta estuary (Sobczak et al. 2002). It is likely that restored freshwater tidal wetlands in the Delta would have higher productivity than the brackish wetlands of Suisun (Odum 1988). A large portion of the production in Suisun Marsh consists of high quality phytoplankton-derived carbon (Sobczak et al. 2002) that is an important food source for zooplankton and therefore can contribute to the base of the pelagic foodweb. Modeling suggests that the tidal wetlands of Suisun currently provide about 6 percent of the organic carbon to the pelagic habitats of Suisun Bay (Jassby et al. 1993). In addition, sampling in Liberty Island shows that these freshwater tidal habitats can be a source of high-quality phytoplankton that contribute to the pelagic food web downstream (Lehman et al. 2008). Thus, restoration of large amounts of intertidal habitat in the Delta and Suisun could enhance the ecosystem's pelagic productivity.

Justification:

Since it was introduced into the estuary in 1988, the zooplankton *Pseudodiaptomus forbesi* has been the dominant summertime prey for delta smelt (Lott 1998; Nobriga 2002; Hobbs et al. 2006). There is evidence suggesting that the co-occurrence of delta smelt and *Pseudodiaptomus forbesi* has a strong influence on the survival of young delta smelt from summer to fall (Miller 2007). The Effects Section indicates that

Pseudodiaptomus distribution may be vulnerable to effects of export facilities operations and therefore, the projects have a likely effect on the food supply available to delta smelt.

The near complete loss of tidal wetlands from the Delta threatens the persistence of delta smelt by reducing productivity at the base of the pelagic foodweb. Primary production in tidal wetlands of the Northern San Francisco estuary has been shown to support high zooplankton growth (Muller-Solger et al. 2002). This action should therefore enhance the foodweb on which delta smelt depend. This action is designed to increase high quality primary and secondary production in the Delta and Suisun Marsh through an increase in tidal wetlands. Exchange of water between the tidal wetlands and surrounding channels should distribute primary and secondary production from the wetlands to adjacent pelagic habitats where delta smelt occur. This exchange should be optimized through intertidal habitat restoration designed to incorporate extensive tidal channels supported an appropriately sized vegetated marsh plain which will provide the necessary tidal prism to maintain large tidal exchange.

New evidence indicates how tidal marsh may benefit delta smelt even if they do not occur extensively within the marsh itself. Specifically, monitoring suggests this species is taking advantage of recently-created tidal marsh and open water habitat in Liberty Island. The fact that delta smelt make heavy use of habitat in the Cache Slough complex has been evident in sampling by the DFG's Spring Kodiak trawl and 20 mm surveys (www.delta.dfg.ca.gov). The Spring Kodiak trawls show that delta smelt are present in channels of the Cache Slough complex during winter and spring; the collection of larval delta smelt in subsequent 20-mm surveys indicates that these adult delta smelt eventually spawn in the vicinity. In addition, the use of Cache Slough complex by delta smelt includes habitat on Liberty Island. The island flooded in 1998 and has evolved rapidly into a system of open-water and tidal marsh habitat. Recent sampling of Liberty Island by USFWS biologists (<http://www.delta.dfg.ca.gov/jfmp/libertyisland.asp>) revealed that delta smelt both spawn and rear in Liberty Island. Light-traps collected relatively high numbers of larval delta smelt in several locations of Liberty Island during the 2003 spawning period for this species. Moreover, subsequent beach seine sampling showed that older delta smelt were present at all ten of their sampling stations during 2002-2004 and in all seasons of the year (USFWS, unpublished data). These results are particularly striking because they were from a period when delta smelt was at record low abundance. Collection of delta smelt from shallow inshore areas using seines indicates that the fish do not occupy deeper pelagic habitat exclusively. These results seem reasonable in light of the area's consistently high turbidity (Nobriga et al. 2005; DWR, unpublished data) and zooplankton abundance (e.g. Sommer et al. 2004), both of which are important habitat characteristics for delta smelt (Bennett 2005; Feyrer et al. 2007). In any case, these data suggest that freshwater tidal wetlands can be an important habitat type to delta smelt with proper design and location.

A monitoring program shall be developed to focus on the effectiveness of the restoration program. This program shall be reviewed and modified as new information becomes available.

on timely hydrologic and biological considerations. Important factors differ from year to year, and need to be considered in operations planning. They include the projected size of the winter-run year class (and thus the extent of habitat needed); timing and location of spawning and redds based on aerial surveys; the extent of the cold water pool, given air temperatures; and operation of the Temperature Control Device to provide optimal use of the cold water pool. Preparation of a draft plan also allows for iterative planning and feedback. Operations can be tailored each year to achieve the optimal approach to temperature management to maintain viable populations of anadromous fish, based on the best available information.

The Calfed Science Program peer review report on temperature management emphasized the importance of refining temperature management practices in the long term and included recommendations for doing so. The requirement to hire an independent contractor to recommend specific refinements to the procedures in this RPA responds to these recommendations.

Action I.2.5. Winter-Run Passage and Re-Introduction Program at Shasta Dam

See Fish Passage Program, Action V

Action I.2.6. Restore Battle Creek for Winter-Run, Spring-Run, and CV Steelhead

Objective: To partially compensate for unavoidable adverse effects of project operations by restoring winter-run and spring-run to the Battle Creek watershed. A second population of winter-run would reduce the risk of extinction of the species from lost resiliency and increased vulnerability to catastrophic events.

Description of Action: 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.

Rationale: Modeling projections in the BA show that adverse effects of ongoing project operations cannot be fully minimized. Severe temperature-related effects due to project operations will occur in some years. This RPA includes an exception procedure in anticipation of these occurrences (see Action I.2.2). Establishing additional populations of winter-run is critical to stabilize the high risk of extinction resulting from the proposed action on the only existing population of this species. \$26 million has been identified for this project in the American Recovery and Reinvestment Act of 2009.

minimum flows for anadromous fish in critically dry years, in lieu of the current 5,000 cfs navigation criterion. Recommendations shall be made to NMFS by December 1, 2009. The recommendations will be implemented upon NMFS' concurrence.

In years other than critically dry years, the need for a variance from the 5,000 cfs navigation criterion will be considered during the process of developing the Keswick release schedules (Action I.2.2-4).

Rationale: In some circumstances, maintaining the Wilkins Slough navigation channel at 5,000 cfs may be a significant draw on Shasta reservoir levels and affect the summer cold water pool necessary to maintain suitable temperatures for winter-run egg incubation and emergence. Reclamation has stated that it is no longer necessary to maintain 5,000 cfs for navigation (CVP/SWP operations BA, page 2-39). Operating to a minimal flow level based on fish needs, rather than on outdated navigational requirements, will enhance the ability to use cold-water releases to maintain cooler summer temperatures in the Sacramento River.

Action I.5. Funding for CVPIA Anadromous Fish Screen Program (AFSP)

Objective: To reduce entrainment of juvenile anadromous fish from unscreened diversions.

Action: Reclamation shall screen priority diversions as identified in the CVPIA AFSP, consistent with previous funding levels for this program. In addition, Reclamation/CVPIA Program shall evaluate the potential to develop alternative screened intakes that allow diverters to withdraw water below surface levels required by the antiquated Wilkins Slough navigation requirement criterion of 5,000 cfs.

Rationale: Approximately ten percent of 129 CVP diversions listed in Appendix D-1 of the CVP/SWP operations BA are currently screened. Of these, most of the largest diversions (greater than 250 cfs) have already been screened; however, a large number of smaller diversions (less than 250 cfs) remain unscreened or do not meet NMFS fish screening criteria (NMFS 1997; e.g., CVP and SWP Delta diversions; Rock Slough diversion). The AFSP has identified priorities for screening that is consistent with the needs of listed fish species. Screening will reduce the loss of listed fish in water diversion channels. In addition, if new fish screens can be extended to allow diversions below 5,000 cfs at Wilkins Slough, then cold water can be conserved during critically dry years at Shasta Reservoir for winter-run and spring-run life history needs.

Action Suite I.6: 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.

The suite of actions includes near term and long-term actions. The near-term action (Action I.6.2) is ready to be implemented and can provide rearing benefits within two years of issuing this Opinion. The long-term actions (Actions I.6.1, I.6.3, and I.6.4) require additional planning and coordination over a five- to ten-year time frame.

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.

Similar actions addressing rearing and fish passage are under consideration in the BDCP development process and may ultimately satisfy the requirements in Actions I.6 and I.7. BDCP is scheduled to be completed by December 31, 2010.

Action I.6.1. Restoration of Floodplain Rearing Habitat

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.

Action: In cooperation with CDFG, USFWS, NMFS, and the Corps, Reclamation and DWR shall, to the maximum extent of their authorities (excluding condemnation authority), provide significantly increased acreage of seasonal floodplain rearing habitat, with biologically appropriate durations and magnitudes, from December through April, in the lower Sacramento River basin, on a return rate of approximately one to three years, depending on water year type. In the event that this action conflicts with Shasta Operations Actions I.2.1 to I.2.3, the Shasta Operations Actions shall prevail.

Implementation procedures: By December 31, 2011, Reclamation and DWR shall submit to NMFS a plan to implement this action. This plan should include an evaluation of options to: (1) restore juvenile rearing areas that provide seasonal inundation at appropriate intervals, such as areas identified in Appendix 2-C or by using the Sacramento River Ecological Flow Tool (ESSA/The Nature Conservancy 2009) or other habitat modeling tools; (2) increase inundation of publicly and privately owned suitable acreage within the Yolo Bypass; (3) modify operations of the Sacramento Weir (which is owned and operated by the Department of Water Resources) or Fremont Weir to increase rearing habitat; and (4) achieve the restoration objective through other operational or engineering solutions. An initial performance measure shall be 17,000-20,000 acres (excluding tidally-influenced areas), with appropriate frequency and duration. This measure is based on the work by Sommer *et al.* (2001, 2004) at Yolo Bypass and on recent analyses conducted for the BDCP process of

inundation levels at various river stages. (BDCP Integration Team 2009).²⁸ The plan may include a proposal to modify this performance measure, based on best available science or on a scientifically based adaptive management process patterned after Walters (1997).

This plan also shall include: (1) specific biological objectives, restoration actions, and locations; (2) specific operational criteria; (3) a timeline with key milestones, including restoration of significant acreage by December 31, 2013; (4) performance goals and associated monitoring, including habitat attributes, juvenile and adult metrics, and inundation depth and duration criteria; (5) specific actions to minimize stranding or migration barriers for juvenile salmon; and (6) identification of regulatory and legal constraints that may delay implementation, and a strategy to address those constraints. Reclamation and DWR shall, to the maximum extent of their authorities and in cooperation with other agencies and funding sources, implement the plan upon completion, and shall provide annual progress reports to NMFS. In the event that less than one half of the total acreage identified in the plan's performance goal is implemented by 2016, then Reclamation and DWR shall re-initiate consultation.

The USFWS' Delta smelt biological opinion includes an action to restore 8,000 acres of tidal habitat for the benefit of Delta smelt. If these 8,000 acres also provide suitable rearing habitat for salmonids, they may be used in partial satisfaction of the objective of this action.

This action is not intended to conflict with or replace habitat restoration planning in the BDCP process.

Rationale: Rearing and migration habitats for all anadromous fish species in the Sacramento basin are in short supply. Project operations limit the availability of such habitats by reducing the frequency and duration of seasonal over-bank flows as a result of flood management and storage operational criteria. Recent evaluations on the Yolo Bypass and Cosumnes River have shown that juvenile Chinook salmon grow faster when seasonal floodplain habitats are available (Sommer *et al.* 2001, 2005; Jeffres *et al.* 2008). Sommer *et al.* (2005) suggest these floodplain benefits are reflected in adult return rates. This action is intended to offset unavoidable adverse effects to rearing habitat and juvenile productivity of winter-run, spring-run, and CV steelhead in the Sacramento River basin, by increasing available habitat that is inundated with the frequency and duration of suitable floodplain rearing habitats during December through April.

In high flow years (*e.g.*, similar to 1998), this action can be achieved solely by inundation of the Yolo Bypass. In other years, this action may be accomplished by a combination of actions such as increasing the year-to-year inundation frequency of existing floodplains such as portions of the Yolo Bypass; by restoring rearing habitat attributes to suitable areas, through restoration or enhancement of intertidal areas such as Liberty Island, creation or re-establishment of side channels, and re-created floodplain terrace areas.

²⁸ The analyses assumed a notch in the Fremont Weir.

Action I.6.2. Near-Term Actions at Liberty Island/Lower Cache Slough and Lower Yolo Bypass

Description of Action: 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 final monitoring report shall be submitted on September 30, 2015, or in the fifth year following implementation of enhancement actions. 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.

Action I.6.3. Lower Putah Creek Enhancements

Description of Action: 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.

Action I.6.4. Improvements to Lisbon Weir

Action: 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.

Rationale for Actions I.6.2 to I.6.4: These actions have been fully vetted by CDFG and found to be necessary initial steps in improving rearing habitat for listed species in the lower Sacramento River basin. These improvements are necessary to off-set ongoing adverse effects of project operations, primary due to flood control operations. Additional descriptions of these actions are contained in the draft amendment to the Delta Fish Agreement (CVP/SWP operations BA appendix Y).

6.4 To ensure the minimization measures designed to minimize take of the Covered Species are effective, Permittee shall conduct inspection, maintenance and reporting on all of the fish screens at the NBA, RRDS, and Sherman Island diversions during November through June. Permittee shall submit a plan, within 3 months of Permit issuance, detailing the inspection, maintenance and reporting scope and schedule that cover the fish screen and any other components that may affect screening efficiency. After the plan is approved by DFG, the Permittee shall adhere to the maintenance, inspection and reporting schedule described in the plan. Effectiveness monitoring requirements for these facilities is described below in Condition 8.

7 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. The following measures, when implemented in conjunction with the flow measures in Condition 5 above, will enhance the estuarine processes and open water habitat beneficial for longfin smelt and provide some additional habitat for longfin smelt in deeper areas. These measures, in conjunction with the flow measures which minimize and partially mitigate take, will fully mitigate take of longfin smelt from the proposed Project.

7.1 To improve overall habitat quality for longfin smelt in the Bay Delta Estuary, Permittee shall fund the acquisition, initial enhancement, restoration, long-term management, and long-term monitoring of 800 acres of inter-tidal and associated sub-tidal wetland habitat in a mesohaline part of the estuary. This condition is intended to provide benefits supplemental to the benefits resulting from the flow requirements described in Condition 5 above. The identification and development of the restoration sites, and development of site-specific management and monitoring plans shall be appropriate to improve habitat conditions for longfin smelt and shall be submitted to DFG for review and approval. The restoration efforts shall begin with the acquisition and planning for restoration of at least 160 acres within 2 years of issuance of this Permit. Subsequent restoration efforts shall restore at least 160 acres every 2 years and all restoration shall be completed by Permittee within 10 years. If longfin smelt are not listed by the Fish and Game Commission at the March 2009 meeting, the inter-tidal and sub-tidal wetland habitat restoration requirement shall be 20 acres for the period from February 23, 2009 to March 6, 2009 and shall be completed by December 31, 2010. These acreages are above and beyond any acres already under development or planned that are required for compliance with any existing CESA permits. Implementation of this may require separate CESA and CEQA consultations to evaluate, minimize and mitigate any restoration effects on other listed species.

7.2 DFG's approval of the Mitigation Lands (Lands) must be obtained prior to acquisition and transfer by use of the Proposed Lands for Acquisition Form or by other means specified by DFG. As part of this Condition, Permittee shall:

7.2.1 Transfer fee title to the Lands, convey a conservation easement, or provide another mechanism approved by DFG over the Lands to DFG under terms approved by DFG. Alternatively, a conservation easement over the Lands may be conveyed to a DFG-approved non-profit organization qualified pursuant to California Government Code section 65965, with DFG named as a third party beneficiary under terms approved by DFG.

7.2.2 Provide a recent preliminary title report, initial Phase 1 report, and other necessary documents. All documents conveying the Lands and all conditions of title are subject to the approval of DFG, and, if applicable, the Department of General Services.

7.2.3 Reimburse DFG for reasonable expenses incurred during title and documentation review, expenses incurred from other state agency reviews, and overhead related to transfer of the Lands to DFG. DFG estimates that this Project will create an additional cost to DFG of no more than \$3,000 for every fee title deed or easement processed.

7.3 All land acquired for the purposes of implementing this Condition shall be evaluated and all appropriative and riparian rights obtained with the land acquisition shall be recorded. All water rights obtained and not necessary for implementation of the long-term management and monitoring plan shall be transferred to in stream beneficial uses under Water Code Section 1707.

8. Monitoring and Reporting:

Permittee shall ensure that information is gathered and reported to ensure proper implementation of the Conditions of Approval of the Permit, that the intended physical results of these Conditions are achieved, and that appropriate and adequate information is gathered to evaluate the effectiveness of these actions on the targeted life stages of longfin smelt so that the actions can be refined, if needed.

8.1 Permittee shall fund its share of the Interagency Ecological Program to continue the following existing monitoring efforts, all of which are key to monitor the Covered Species response to Project operations and the Conditions of Approval of this Permit. These include sampling of the FMWT, Spring Kodiak Trawl, 20-mm Survey, Smelt Larval Survey, and Bay Study.

8.2 Permittee shall fund additional monitoring related to the extent of the incidental take of longfin smelt and the effectiveness of the minimization measures. Immediate needs include extension of the time period of the existing smelt larval

Permit. The Permittee shall continue to work and coordinate with DFG salvage staff to ensure as close to real time information sharing as feasible.

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.

9.1 Permittee shall provide sufficient funding for perpetual management and monitoring activities on the required compensatory habitat lands (Lands) identified in Condition 7. To determine the amount sufficient to fund all monitoring efforts and the operations, maintenance and management on the Lands, the Permittee shall prepare a Property Analysis Record (PAR) or PAR-equivalent analysis prior to providing the funding for each approved Lands parcel. The Permittee shall submit to DFG for review and approval the results of the PAR or PAR-equivalent analysis. This analysis will be reviewed by the DFG to determine the appropriate first year management costs and long-term funding amount necessary for the in-perpetuity management of the Lands. As each parcel of the Lands is acquired and following DFG review and approval of the PAR, the funding shall be provided by Permittee.

9.2 Permittee may proceed with the Project before completing all of the required mitigation (including acquisition of Mitigation Lands), monitoring, and reporting activities only if Permittee ensures funding to complete those activities by providing funding assurance to DFG. Within 3 months after the effective date of this Permit, 20% of the funding assurance shall be provided. Additional 20% payment shall be provided at years 2, 4, 6 and 8. The funding assurance shall be provided in the form of a bond in the form of Attachment C or irrevocable stand-by letter of credit in the form of Attachment D or another form of funding assurance approved by the Director, demonstrating DWR's financial commitment through SWP secured funding sources. The funding assurance will be held by DFG or in a manner approved by DFG. The funding assurance shall allow DFG to draw on the principal sum if DFG, at its sole discretion, determines that Permittee has failed to comply with the Conditions 6, 7 and 8 of this Permit. The funding assurance (or any portion of such funding assurance then remaining) shall be released to the Permittee after all of the Permit Conditions have been met as evidenced by:

- Timely submission of all required reports;
- An on-site inspection by DFG; and
- Written approval from DFG.

Even if funding assurance is provided, the Permittee must complete the required acquisition, protection and transfer of all required Lands and record any required conservation easements no later than 10 years after the issuance of this Permit, as

specified in Condition 7. DFG may require the Permittee to provide additional Lands and/or additional funding to ensure the impacts of the taking are minimized and fully mitigated, as required by law, if the Permittee does not complete these requirements within the specified timeframe.

The funding assurance shall be in the amount of \$2,400,000.00 based on the following estimated costs of implementing the Permit's mitigation, monitoring and reporting requirements. The Permittee shall notify the DFG upon furnishing each of the following financial assurances, or substantial equivalent approved by DFG:

- a) Land acquisition costs for impacts to habitat, calculated at \$1,500.00/acre for 800 acres: \$1,200,000.00.
- b) Costs of enhancing Lands, calculated at \$250.00/acre for 800 acres: \$200,000.00.
- c) Endowment costs initially estimated at \$1,000,000.00, or substantial equivalent approved by DFG.

Amendment:

This Permit may be amended without the concurrence of the Permittee if DFG determines that continued implementation of the Project under existing Permit conditions would jeopardize the continued existence of a Covered Species or that Project changes or changed biological conditions necessitate a Permit amendment to ensure that impacts to the Covered Species are minimized and fully mitigated. DFG may also amend the Permit at any time without the concurrence of the Permittee as required by law.

Stop-Work Order:

To prevent or remedy a potential violation of permit conditions, DFG will consult with Permittee to address the potential violation and will give Permittee a reasonable time to correct the potential violation and implement possible alternative actions before issuing a stop-work order. Director may issue Permittee a written stop-work order to suspend any activity covered by this Permit for an initial period of up to 25 days to prevent or remedy a violation of Permit conditions (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. Permittee shall comply with the stop-work order immediately upon receipt thereof. DFG may extend a stop-work order under this provision for a period not to exceed 25 additional days, upon written notice to the Permittee. DFG shall commence the formal suspension process pursuant to California Code of Regulations, Title 14, section 783.7 within five working days of issuing a stop-work order.

Compliance with Other Laws:

This Permit contains DFG's requirements for the Project pursuant to CESA. This permit does not necessarily create an entitlement to proceed with the Project. Permittee is responsible for complying with all other applicable state, federal, and local laws.

Proposed Agreement Commitments and Estimated Costs													Attachment 4		
Restoration - Mitigation Actions ¹	Action Features	Anticipated Benefits	Status	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL	
SECTION A. Delta Smelt & Longfin Smelt Actions															
A1. Early Implementation Actions															
Cache Slough Complex a. Prospect Island b. Liberty Island	a. Up to 1316 acres. b. TBD based on enhancement of existing habitat over baseline conditions.	Habitat benefits for improved estuarine processes and function to support delta smelt, longfin smelt and other Fish Species.	In Progress												
A2. Additional Potential Mitigation Actions for In-Delta Acreage															
Actions in the Delta, Suisun Marsh, and Cache Slough Complex: a. Western Cache Slough Complex b. Little Holland Tract Restoration Project c. Eastern Egbert Tract Restoration Project d. Hill Slough West Tidal Marsh Restoration	a. Acres to be determined. b. Acres to be determined. c. Acres to be determined. d. 207-1100 acres	a. Food web, tidal processes, habitat. b. Tidal Processes, habitat, d. Habitat benefits for improved estuarine processes and function to support delta smelt, longfin smelt and other Fish Species.	Planning												
SECTION B. Anadromous Fish Actions															
B1. Early Implementation Actions															
Battle Creek Phase 2	Open 31.5 miles of spawning/rearing habitat	Winter/spring-run, Chinook, spawning/rearing	Planning	\$12,000,000 One time-fixed cost										\$12,000,000	
B2. Additional Potential Anadromous Actions															
a. Lower Putah Creek Re-Alignment b. Lisbon Weir Improvements c. Tule Canal Connectivity d. Fremont Weir Fish Passage e. Yolo Bypass Floodplain Habitat f. Additional Listed Anadromous Fish Species Project Opportunities	Improved juvenile rearing, upstream passage for adult anadromous fish and downstream passage for juvenile anadromous species • Water Right purchase • Water/energy bypass purchase • Tributary restoration action • Fish passage improvements	a. Fall-run Chinook b. Passage – Chinook, sturgeon, splittail c. Passage – Chinook, sturgeon, splittail d. Passage – Chinook, sturgeon, splittail e. Spawning, rearing, and foodweb – splittail, Chinook, rearing f. TBD	Ongoing												
Section C Total Estimated costs															
				\$20 Million ²			\$36 Million		\$40 Million		\$32 Million		\$32 Million	\$160 Million	
SECTION D.															
DFG Staff Resources	Estimated Staff necessary to support mitigation activities. 8 PYs Total: 5 PY- Planning and Monitoring 3 PY- restoration habitat management planning & transfer agreements.	Facilitate implementation of mitigation actions.		\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$10,000,000	
DWR Staff Resources	Estimated Staff necessary to support mitigation activities. Total 5 PYs New Positions.			\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$7,500,000	
YEARLY SUMMATION of COSTS				\$33,750,000	\$1,750,000	\$1,750,000	\$37,750,000	\$1,750,000	\$41,750,000	\$1,750,000	\$33,750,000	\$1,750,000	\$31,750,000	\$187,500,000	
Percent progress towards agreement mitigation acreage. To Be Determined (TBD).				• TBD (up to 3000 acres)	TBD	TBD	35%	TBD	60%	TBD	80%	TBD	100%	100%	

¹ Delta Fish Agreement Actions that DWR will continue to implement include: Delta Bay Enhanced Enforcement Project (DBEEP); Suisun Marsh Fish Screen Operations and Maintenance Project; Prospect Island Habitat Restoration Project; Spring-Run Warden Overtime Program; Deer Creek Water Exchange Program; Mill Creek Water Exchange Program; Butte Creek Fish Passage and Monitoring Program; San Joaquin River Maintenance Project- Tuolumne, Merced, Stanislaus Rivers Gravel and Habitat Maintenance; Tuolumne River Salmon Habitat- La Grange Gravel Project; Merced River Salmon Habitat- Wing Deflector Gravel Project; Merced River Salmon Habitat- Robinson Reach and Ratzlaff Reach; Merced River Hatchery; Hills Ferry Barrier San Joaquin Project; Upper Western Stone Project- Merced River Habitat Project.

² These funds are to be expended over the first three to five years, or as determined when the projects are fully designed. Estimated costs based on \$20,000/acre to acquire and restore habitat, actual costs will vary.