**Biological Opinions Impacting Yolo Bypass**

Cut and paste from NOAA’s 2009 Salmonid Biological Opinion: “*Biological and conference opinion on the long-term operations of the Central Valley Project and State Water Project.”*

**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 reestablishment 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 multispecies 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). 611

**Action I.7. Reduce Migratory Delays and Loss of Salmon, Steelhead, and Sturgeon at Fremont Weir and Other Structures in the Yolo Bypass**

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.

Description of 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, 2011, 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).

Rationale: The Yolo Bypass and Fremont Weir has been a documented source of migratory delay to, and loss of, adult winter-run, spring-run, CV steelhead and Southern DPS of green sturgeon. The existing fish passage structure is inadequate to allow normal passage at most operational levels of the Sacramento River. The project agencies must work with the Corps, which owns and operates Fremont Weir, to achieve improvements for fish. Other structures within the Yolo Bypass, such as the toe drain, Lisbon Weir, and irrigation dams in the northern end of the Tule Canal, also can impede migration of adult anadromous fish.

Additionally, stranding of juvenile salmonids and sturgeon has been reported in the Yolo Bypass in scoured areas behind the weir and in other areas. This action offsets unavoidable project effects on adult migration and minimizes the direct losses from flood management activities associated with operations.

Cut and paste from USFWS’ 2008 **Delta Smelt Biological Opinion**, “Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP)”

**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.