

**Draft Biological Assessment for the Reinitiation of Consultation on
the Coordinated Long-term Operation of the Central Valley Project
and State Water Project**

Annotated Outline

DRAFT

December 2016

1 **1 Introduction**

2 (Text to be developed).

3 **1.1 Relationship to Existing Biological Opinions**

4 (Text to be developed).

5 **1.2 Species Considered**

6 **1.2.1 Species Addressed**

- 7 • Chinook Salmon, Sacramento River Winter-Run ESU
- 8 • Chinook Salmon, Central Valley Spring-Run ESU
- 9 • Steelhead, California Central Valley DPS
- 10 • Steelhead, Central California Coast DPS
- 11 • North American Green Sturgeon, Southern DPS
- 12 • Killer Whale, Southern Resident DPS
- 13 • Eulachon
- 14 • Coho Salmon
- 15 • Delta Smelt
- 16 • Riparian Brush Rabbit
- 17 • Riparian Woodrat
- 18 • Salt Marsh Harvest Mouse
- 19 • California clapper rail
- 20 • Giant Garter Snake
- 21 • California red-legged frog
- 22 • Valley Elderberry Longhorn Beetle
- 23 • Soft Bird's Beak
- 24 • Suisun Thistle

25 **1.2.2 Species Considered but Not Addressed Further**

26 (List to be determined).

27

28 *Longfin smelt is considered a threatened species under the California Endangered Species Act*

29 *and population levels are declining, but is not proposed to be addressed as it is not currently*

30 *listed under the federal Endangered Species Act. If longfin smelt is federally listed during the*

31 *informal consultation process, Reclamation will coordinate with U.S. Fish and Wildlife Service*

32 *to determine next steps for addressing the species.*

33

34 **2 Consultation History**

35 (Text to be developed).

36

1 **3 Description of the Proposed Action**

2 This section begins with an introduction to the CVP, SWP, existing laws and regulations.
3 The planning horizon for the action is anticipated to be through the year 2060.

4
5 The Proposed Action will include a description of: (1) the action to be consulted upon; (2) where
6 the action will take place; (3) when the action will take place; (4) Reclamation's and DWR's
7 authority to take the action; (5) measures that relate to how the action will be accomplished; and
8 (6) conservation measures such as avoidance measures, seasonal restrictions, compensation, or
9 restoration/creation. The Proposed Action description will include appropriate maps and figures
10 to illustrate the location and appropriate details described in the text. The project maps and
11 narratives will describe all the areas to be affected directly or indirectly by the Federal action.

12 **3.1 Introduction**

13 **3.1.1 Central Valley Project**

- 14 • Trinity River
 - 15 ○ Clair Engle Lake
 - 16 ○ Lewiston Dam
 - 17 ○ Whiskeytown
- 18 • Sacramento
 - 19 ○ Shasta Dam
 - 20 ○ Keswick
- 21 • American
 - 22 ○ Folsom
- 23 • Stanislaus
 - 24 ○ New Melones
- 25 • Delta
- 26 • San Joaquin River
 - 27 ○ Millerton Lake

28 The CVP facilities include reservoirs on the Trinity, Sacramento, American, Stanislaus, and San
29 Joaquin rivers.

- 30 • A portion of the water from Trinity River is stored and re-regulated in Clair Engle Lake,
31 Lewiston Lake, and Whiskeytown Reservoir, and diverted through a system of tunnels
32 and powerplants into the Sacramento River.
- 33 • Water is also stored and re-regulated in Shasta and Folsom reservoirs.
- 34 • Water from these reservoirs flows into the Sacramento River.

- The Sacramento River carries water to the Sacramento-San Joaquin Delta (Delta). The Jones Pumping Plant at the southern end of the Delta lifts the water into the Delta Mendota Canal (DMC). This canal delivers water to CVP contractors, who divert water directly from the DMC, and exchange contractors on the San Joaquin River, who divert directly from the San Joaquin River and the Mendota Pool. CVP water is also conveyed to the San Luis Reservoir for deliveries to CVP contractors through the San Luis Canal. Water from the San Luis Reservoir is also conveyed through the Pacheco Tunnel to CVP contractors in Santa Clara and San Benito counties.
- The CVP provides water from Millerton Reservoir on the San Joaquin River to CVP contractors located near the Madera and Friant-Kern canals.
- Water is stored in the New Melones Reservoir for water rights holders in the Stanislaus River watershed and CVP contractors in the northern San Joaquin Valley.

3.1.2 State Water Project

DWR operates and maintains the SWP, which delivers water to agricultural and municipal and industrial (M&I) contractors in northern California, the San Joaquin Valley, the Bay Area, the Central Coast, and southern California.

- SWP water is stored and re-regulated in Lake Oroville and released into the Feather River, which flows into the Sacramento River.
- Water is exported from the Delta at the Banks Pumping Plant and other facilities. The Banks Pumping Plant lifts the water into the California Aqueduct, which delivers water to the SWP contractors and conveys water to the San Luis Reservoir.
- The SWP also delivers water to the Cross-Valley Canal, when the systems have capacity, for CVP water service contractors.

3.1.3 California WaterFix

Concepts would be developed to assess how or if we should include WaterFix as part of the modeling of the baseline.

3.1.4 Coordinated Operations Agreement

Because COA discussions are ongoing, there may be a potential to establish sideboards in modeling to account for different possible scenarios.

3.1.5 Water Quality Control Plan

Because the water quality control plan updates are not finalized, there may be a potential to establish sideboards in modeling scenarios.

1

2 **3.2 Proposed Action Across the CVP and SWP**

3 The Proposed Action may include the following.

4

5 **3.2.1 Hatchery Operations and Management**

6 *The Proposed Action may explore changes to hatchery operations and management such as*
7 *Hatchery Genetics Management Plans for winter-run Chinook salmon.*

8

9 **3.2.2 Habitat Restoration**

10 *The Proposed Action may include habitat restoration in order to offset project impacts to species*
11 *in the Delta and/or upstream tributaries which may increase food supplies for protected species,*
12 *provide refugia, or suppress predation, improving population resiliency.*

13

14 **3.2.3 Predator Control**

15 *Reclamation may consider updated scientific studies that could lead to a proposed action that*
16 *includes invasive predator controls, such as programs for removal of water hyacinth and/or*
17 *invasive predator fish.*

18

19 **3.2.4 Flood Curve Updates**

20 *Updated flood curves, due to climate change, may result in changes to reservoir operations*
21 *across the CVP and SWP, which may be considered as part of the process.*

22

23 **3.2.5 Water Contracts**

24 *Existing CVP and SWP contracts by division, transfers, exchanges, accelerated water transfer*
25 *program, and long-term Warren Act contracts may be included in the proposed action. Water*
26 *contract clauses that satisfy most contracts will be included.*

27

28 **3.2.6 Recapture and Recirculation**

29 *Where appropriate and feasible, recapturing environmental flows downstream of use areas and*
30 *re-using as water supply will be explored.*

31

32 **3.3 Proposed Action in the Delta**

33 The Proposed Action may include the following:

1

2 **3.3.1 Old and Middle River**

3 *Evaluation of methods to assess the efficacy of OMR RPA actions in the 2008 USFWS BO and*
4 *the 2009 NMFS BO. If OMR actions carry forward, engage in further evaluation of methods to*
5 *combine the Old and Middle River (OMR) actions (2008 USFWS BO RPA Actions 1 through 3,*
6 *and the 2009 NMFS BO RPA Actions 4.1.2 and 4.2.1), and also address the efficacy and*
7 *objectives of the San Joaquin River Inflow to Export (I/E) Ratio (2009 NMFS BO RPA Action*
8 *IV.2). The methods evaluated may be based on fish presence and behavior, and could include*
9 *development of criteria for operational triggers and off-ramps, rather than dates.*

10

11 *Continued evaluation of an OMR Index. The existing 2008 USFWS BO and 2009 NMFS BO*
12 *require compliance determinations for the OMR flow requirements through the use of 5-day and*
13 *14-day running averages of tidally filtered daily gage data, as measured by the U.S. Geological*
14 *Survey (USGS). The tidally filtered gage data is not available on a real-time basis, which makes*
15 *it difficult to make operational decisions or project future operations. An OMR Index was*
16 *developed in 2009 for use in planning efforts by the CVP and SWP operators. Development of*
17 *an index could include coordinated monitoring and reporting of the USGS tidally filtered gage*
18 *data and the OMR Index values.*

19

20 **3.3.2 Delta Cross Channel Gate Closure**

21 *Exploration and analysis of possible operational criteria for the Delta Cross Channel gates.*

22

23 **3.3.3 Possible Georgiana Slough gate**

24 *Consideration of a possible gate at Georgiana Slough.*

25

26 **3.3.4 Head of Old River Barrier**

27 *The Proposed Action may include consideration of the Head of Old River barrier.*

28

29 **3.3.5 Fish Salvage Efficiency Studies**

30 *Studies of efficiency of fish salvage at the CVP and SWP pumping plants may be considered as*
31 *part of the Proposed Action.*

32

33 **3.3.6 Delta Outflow**

34 *Long-term implementation of Delta outflow through acquisition of water and/or operational*
35 *changes may be considered.*

1

2 **3.3.7 Water Quality Control Plan**

3 *Final Phase I and/or II requirements from the SWRCB's Water Quality Control Plan,*
4 *coordinated with the New Melones Revised Plan of Operations, may be a component of the*
5 *analysis and modeling scenarios.*

6

7 **3.3.8 COA Negotiations**

8 *Current or final status of Coordinated Operations Agreement discussions will be considered for*
9 *inclusion as possible modeling sideboards.*

10

11 **3.3.9 Delta Smelt Conservation Hatchery**

12 *The Proposed Action may include consideration of a conservation hatchery for Delta Smelt,*
13 *which could be used to maintain population levels.*

14

15 **3.3.10 Habitat Restoration**

16 *Consideration of habitat restoration in the Delta and/or upstream tributaries may increase food*
17 *supplies for protected species and improve ecosystem conditions, thus improving population*
18 *resiliency.*

19 **3.4 Proposed Actions in the Sacramento River**

20 The Proposed Action may include the following:

21

22 **3.4.1 Shasta Dam Cold Water Pool**

23 *Implementation of SWRCB 90-05 may be included.*

24

25 *The Proposed Action may include research and implementation of engineering solutions to*
26 *utilize inaccessible cold water pool in Shasta Reservoir and minimize warm water leaks through*
27 *the Shasta Dam temperature control device to improve Sacramento River temperature*
28 *management (Anderson et al. 2014).*

29

30 **3.4.2 Sacramento River Temperature Criteria and RPA Adjustment Process**

31 *Adjustments considered as part of the Shasta RPA Adjustment process but that cannot be*
32 *accomplished in the short-term will be considered for inclusion in the Proposed Action.*

1 **3.4.3 Keswick Release Schedule**

2 *Reclamation will explore possibly including modified NMFS Shasta RPA adjustment actions.*

3 **3.4.4 Other Stressor Studies and Monitoring**

4 *Study other stressors associated with water temperatures and operations, such as disease,*
5 *predation, lack of spawning and rearing habitat, food web supply, and bioenergetics.*

6

7 *Include (1) redd-dewatering and juvenile stranding monitoring; (2) additional temperature and*
8 *dissolved oxygen monitoring in the Sacramento River; and (3) spawning gravel and juvenile*
9 *rearing habitat monitoring (11.2.1.3).*

10 **3.4.5 Technical Workgroup Coordination**

11 *Consideration of the Shasta Water Interagency Management Team (SWIM Team) and its*
12 *objectives, roles, and responsibilities. Possibly include updating the objectives, roles, and*
13 *responsibilities of the Sacramento River Temperature Task Group (SRTTG) to reflect a need for*
14 *year-round flow and temperature planning and management.*

15 **3.4.6 Sacramento River Temperature Modeling and Coordination**

16 *The Proposed Action may include providing increased collaboration between Sacramento River*
17 *Settlement contractors, National Marine Fisheries Service, and Reclamation to share*
18 *temperature modeling efforts. Possibly develop new Shasta Reservoir and Sacramento River*
19 *water temperature forecasting and modeling tools, including: (1) developing a collaborative*
20 *science plan for model improvements; (2) the NMFS-SWFSC coupled reservoir and River*
21 *Assessment Forecasting Tool (RAFT) modeled outputs into real-time operations and monthly*
22 *forecasts; and (3) developing and implementing an integrated*
23 *Shasta/Whiskeytown/Trinity/Lewiston operations and temperature model.*

24 **3.4.7 Cache Slough Food Action**

25 *Possibly implement a Flow For Food Study as part of the Adaptive Management of the existing*
26 *Fall X2 RPA Action, in which Colusa Basin Drain drainage water that is normally discharged*
27 *into the Sacramento River at Knight's Landing, is instead routed down Ridge Cut Slough*
28 *through the Yolo Bypass toe drain to the Cache Slough Complex. The goal is to re-create the*
29 *conditions that led to substantial fall phytoplankton blooms in the lower Sacramento River in*
30 *2011 and especially in 2012. If the experiment proves successful, Reclamation and DWR could*
31 *request that this action replace or modify the Fall X2 RPA Action (2008 USFWS BO Component*
32 *3).*

33 **3.4.8 Livingston Stone Fish Hatchery**

34 *Explore possible inclusion of expansion or modifications to the fish hatchery.*

35

1 **3.4.9 Battle Creek Winter-Run Chinook Salmon Reintroduction**

2 *Reintroduction of winter-run Chinook salmon in Battle Creek may be evaluated.*

3 **3.5 Trinity River**

4 The Proposed Action may include the following:

5 **3.5.1 Trinity Dam Operations**

6 *Trinity Dam operations may be included in the Proposed Action.*

7 **3.5.2 Trinity River Restoration Program**

8 *Trinity River Restoration Flows are released in accordance with the Record of Decision signed
9 in 2000, and Biological Opinions by NMFS and USFWS at that time. Trinity River Restoration
10 Flows vary depending on 5 water year types, and range from 369,000 acre-feet (AF) in critically
11 dry years, with a maximum release of 1,500 cubic feet per second (cfs) for 36 days. In extremely
12 Wet years, Trinity River Restoration Flows may total up to 815,000 AF, with a maximum release
13 of 11,000 cfs over 5 days. Pulses generally occur in late April through June.*

14 **3.5.3 Klamath River Long-Term Flow Augmentation**

15 *The Proposed Action may include continued annual release of water in the late summer from
16 Lewiston Reservoir into the Trinity River to prevent Ich-related fish disease issues in the lower
17 Klamath River. Adjustment of CVP operations to account for this release as well as required 50
18 TAF to Humboldt County.*

19 **3.6 Clear Creek Actions**

20 The Proposed Action may include the following:

21 **3.6.1 Clear Creek Maintenance Flows**

22 *Possible inclusion of pulse flows for channel maintenance utilizing the regular outlet once every
23 3 years capped at 7,000 AF (instead of utilizing Glory Hole Spillway in non-flood operation) or
24 using Glory Hole Spillway opportunistically during storm events when appropriate. The existing
25 RPA requires use of the Glory Hole Spillway in Whiskeytown Reservoir, which is only designed
26 for flood management operations when the water elevations are extremely high in the reservoir
27 2009 NMFS BO (RPA Action I.1.2).*

28
29 *The Proposed Action may include attraction pulse flows capped at 7,000 AF for easier planning
30 of annual operations.*

1 **3.6.2 Clear Creek Segregation**

2 *Reclamation may explore additional methods to segregate Spring-run Chinook and Fall-run
3 Chinook salmon on Clear Creek as part of the Proposed Action. Warming up the lower river to
4 increase spring-run upstream migration may improve segregation efforts. Other solutions may
5 include filling in holes in the lower river where Spring-run Chinook salmon like to hold in areas
6 that overlap with Fall-run Chinook salmon spawning.*

7 **3.6.3 Clear Creek Temperature Targets**

8 *Alternative temperature targets may be explored as part of development of the Proposed Action.*

9 **3.6.4 Whiskeytown Dam release outlets**

10 *Installation of a device on Whiskeytown Reservoir to allow access to different reservoir levels
11 might help balance temperature and gravel mobilization flow concerns.*

12 *Modifications to the existing temperature curtain may be investigated.*

13 **3.6.5 Side Channel Restoration**

14 *This revised action may also include mechanical side channel restoration when flow actions
15 have not adequately addressed the needs for Chinook salmon habitat.*

16 **3.7 American River**

17 The Proposed Action may include the following:

18 **3.7.1 Water Control Manual Update**

19 *Any water control manual updates may be considered for inclusion in the Proposed Action.*

20 **3.7.2 American River Flow Management Standard**

21 *The Proposed Action may include a revised American River Flow Management Standard,
22 updated based on operational and biological criteria and concerns.*

23 **3.7.3 Structural Modifications**

24 *Structural modifications that may be explored:*

- 25 *• Independent operation of Folsom dam shutters for temperature*
- 26 *• Fish passage above Folsom Dam*

27 **3.8 Stanislaus River**

28 The Proposed Action will include the following:

29 30

1 **3.8.1 New Melones Revised Plan of Operations**

2 *A revised plan of operations (RPO) for New Melones Reservoir that considers methods to
3 implement the Central Valley Project Improvement Act Section 3406(b)(2) provisions, SWRCB
4 D-1641 and D-1422, CDFW requirements under the 1987 Agreement, Central Valley Regional
5 Water Quality Control Board Basin Plan, in-basin water rights, and flood control objectives in a
6 manner that would avoid causing jeopardy to listed species or destroying or adversely modifying
7 designated critical habitat.*

8 **3.9 San Joaquin River**

9 The Proposed Action will include the following:

10 **3.9.1 San Joaquin River Restoration Program Flows**

11 *San Joaquin River Restoration Program flows (Restoration Flows) are released in accordance
12 with Public Law 111-11, the Stipulation of Settlement of NRDC vs. Rodgers, and the
13 Programmatic Environmental Impact Statement / Environmental Impact Report, Record of
14 Decision, and Biological Opinions from the United States Fish and Wildlife Service and the
15 National Marine Fisheries Service completed in 2012.*

16
17 *Restoration Flows vary depending on the San Joaquin River Restoration Program water year
18 type, which is determined based on the unimpaired inflow to Millerton Reservoir. In a Critical-
19 Low water year type, there are no Restoration Flows. In a Wet water year type, up to 556.6
20 thousand-acre feet of Restoration Flows may be released. Restoration Flows are released as a
21 baseflow in most years of 350 cubic feet per second with a large spring and smaller fall pulse.*

22 **3.9.2 Recapture and Recirculation**

23 *This action, included in Public Law 111-11 and in the Stipulation of Settlement of Natural
24 Resources Defense Council (NRDC) vs. Rodgers., et al, includes recapturing Restoration Flows
25 from the San Joaquin River downstream of the Merced River confluence. Recapture would be
26 done through existing Patterson or Banta Carbona Irrigation District pumping plants or new
27 facilities in the lower San Joaquin River or Delta. Recaptured water would be moved through the
28 Delta Mendota Canal and/or the California Aqueduct to San Luis Reservoir, and where
29 applicable, across the Cross-Valley canal and back to the Friant-Kern Canal.*

30 **3.10 Adaptive Management Actions**

31 *Annual Reasonable and Prudent Alternative Independent Science Panel Review could be
32 replaced by a more in-depth review, on a biennial frequency with a more system-wide approach
33 including additional expertise. Adaptive management activities would need to be coordinated
34 with other science policy and management groups, as appropriate.*

- 1 **3.11 Operations and Maintenance of New and Existing Facilities**
- 2 **3.12 Conservation Measures**
- 3 **3.13 Interrelated or Interdependent Actions**
- 4 **4 Action Area and Environmental Baseline**
 - 5 **4.1 Action area**
 - 6 **4.2 Environmental Context**
 - 7 **4.2.1 Historical Conditions**
 - 8 **4.2.2 Physical Environment**
 - 9 **4.2.2.1 Climate Conditions**
 - 10 **4.2.2.2 Hydrologic Conditions**
 - 11 **4.2.3 Existing Reasonable and Prudent Alternative Actions from 2008 and 2009 USFWS and NMFS Biological Opinions Carried forward in the Proposed Action**

14 *After sufficient analysis and discussion, some RPA actions included in the 2008 and 2009 USFWS and NMFS Biological Opinions may be carried forward in the Proposed Action. In other cases, the Proposed Action may include components that meet the intent of the RPA action but increase operational flexibility and sustainability.*
 - 19 **5 Effects Analysis**

20 (Text to be determined).
 - 21 **5.1 (Sections for all Species)**
 - 22 **5.1.1 Effects of Construction**
 - 23 **5.1.2 Effects of Operation**
 - 24 **5.1.3 Effects of Maintenance**
 - 25 **5.1.4 Cumulative Effects**
 - 26 **5.1.5 Effects of Monitoring Activities**
 - 27 **6 Effects Determination**

28 (Text to be determined).