

## **PLAN FOR PROTECTION OF FISH, WILDLIFE, AND OTHER LEGAL USERS OF WATER DURING JOINT POINT OF DIVERSION**

### **Introduction**

Water Rights Decision 1641 (D1641) authorizes the diversion of water by the U.S. Bureau of Reclamation (Reclamation) and the Department of Water Resources (DWR) through each other's Delta pumping plants as long as certain conditions are met. This authorized change of the point of diversion for the projects is known as Joint Points of Diversion, or "JPOD."

D1641 authorizes three stages of JPOD, each carrying successively more restrictive conditions for use. Stage 1 JPOD was found to not injure legal users of water and to not have a significant adverse effect on fish and wildlife, but does require consultation with DFW, USFWS, and NMFS before diversion or re-diversion is allowed. For Stages 2 and 3 JPOD uses, Reclamation and DWR are required to develop, in consultation with the California Department of Fish and Wildlife (DFW), the U.S. Fish and Wildlife Service (FWS), and NOAA Fisheries (NMFS), an operations plan to protect fish and wildlife and other legal users of water.

This document describes the essential elements of a "fishery protection plan" for JPOD to avoid or minimize adverse fish and wildlife impacts of Stages 2 and 3 JPOD. This plan is designed to protect fish and wildlife under the current conditions, operations requirements, and regulatory environment. It is consistent with the 2008 FWS's Biological Opinion for Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP) and 2009 NMFS's Biological Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (BiOps) for fish species of concern. The operational conditions for JPOD use will be reassessed when new or revised biological opinions on CVP and SWP operations are issued. This plan may be amended, but only with written approval from the Executive Director of the State Water Resources Control Board (SWRCB). Should conditions for JPOD use change significantly, a revised plan to protect the fish, wildlife and other legal users of water would be submitted to the Executive Director of the SWRCB for approval.

This plan relies on an existing network of monitoring, data collection, and processing, and its implementation uses a process of coordination, data evaluation, and decision-making which is already in place and has evolved subsequent to the adoption of D-1641. Fish protection actions are based on real-time assessment of biological and hydrologic conditions both prior to, and during, JPOD actions. Specific criteria define conditions suitable for JPOD use and serve as triggers or action levels. Any proposed actions related to JPOD operations that deviate from those outlined in this fish protection plan will be submitted to the Executive Director of the SWRCB for approval.

Once it has been determined that the monitoring or conditions have triggered a required change to JPOD operations, Reclamation and DWR will implement the required actions as soon as possible. Due to scheduling constraints, a change in JPOD operations may take as long as three days to implement, but if DFW, FWS, and NMFS (collectively designated as the fish agencies) determine that the action is an emergency or it requires immediate attention, Reclamation and DWR will make every effort to implement the change in as little as three hours and within 24 hours after notification.

### **Elements of the Fish Protection Plan**

The following elements, (a)-(f), are required by D1641 for JPOD. Measures to address each requirement follow each item.

***Element (a):***

*Specific measures to avoid or minimize the effects of export operations at Banks/Tracy Pumping Plants on entrainment and through-Delta survival of Chinook salmon. Monitoring of environmental conditions and fish abundance at upstream locations, as appropriate, to determine vulnerability of ESA listed species to entrainment at Banks/Tracy Pumping Plants. The plan shall include monitoring of entrainment at Skinner Fish Protection Facility and Tracy Fish Salvage Facility, including frequency and method of data collection.*

Salmonid Monitoring

Measures to avoid or minimize the effects of export operations at Banks and Tracy Pumping Plants on entrainment and through-Delta survival of Chinook salmon include an existing monitoring network, to indicate when Chinook salmon are migrating from tributaries and downstream within the Sacramento River and San Joaquin River and when they are present in the Delta and **potentially** vulnerable to the effects of export pumping, including JPOD. Historically, migrating fish are not present upstream of the Delta during the June through September period and there is no regular scheduled monitoring in the lower Sacramento River or San Joaquin River. Many of the upstream salmonid monitoring projects cease to operate during the June through September period because too few salmonids have been caught in the past to justify the effort, although sampling at Red Bluff Diversion Dam continues year round. There is continued monitoring of fish in the Delta throughout the year.

Sacramento River Basin Chinook Salmon and Steelhead

The Sacramento River Temperature Task Group (SRTTG) monitors results from various sampling programs that continue through the summer for indications of adult ESA-listed salmon migration and spawning in the upper Sacramento River, including carcass surveys and aerial redd counts. DFW monitors the extent of juvenile salmonid stranding and isolation, and conducts fish rescues in the upper mainstem Sacramento River.

The DFW operates rotary screw traps on the Sacramento River at Knights Landing, as allowable by ESA permits, throughout the period of Chinook emigration, October through May. The data obtained from the screw traps indicate the downstream movement of juvenile salmonids from the upper Sacramento River and tributaries (upstream of the Feather River confluence) toward the Delta. The number of unclipped juvenile Chinook salmon and steelhead captured in the traps is converted to a catch index (catch per unit of trapping effort, i.e. fish per trap per 24 hours of sampling or fish per trap-day) for each Chinook salmon run and steelhead. The older juvenile Chinook salmon (i.e., Chinook salmon greater than the minimum winter-run Chinook salmon run length at date size criteria) catch index is a factor in decisions on Delta Cross Channel (DCC) gates operations to protect fish. Closing the gates reduces the number of Chinook salmon that enter the central Delta where they have a higher chance of swimming to the pumps and a lower survival rate than for those that remain in the Sacramento River.

The flow gauge on the Sacramento River at Wilkins Slough is operated by the United States Geologic Survey (USGS) and DWR. The gauge takes a reading every 15 minutes, and the real-

time data are posted on the California Data Exchange Center (CDEC) website. A 20% increase in flow during a 24-hour period is associated with a potential increase in the number of juvenile salmonids emigrating past Knights Landing and to the Delta. This serves as an indication for Reclamation and DWR to follow salmon monitoring data more closely but does not specifically trigger protective actions.

#### San Joaquin River Basin Chinook Salmon and Steelhead

The Mossdale trawl is operated by the FWS three days per week, October through May. FWS and DFW conduct additional trawling during the April and May peak outmigration period. The trawls detect salmonids moving downstream in the lower San Joaquin River and indicates the pattern of occurrence of salmonids in the southern Delta near the pumping plants. The trawl catches emigrating Chinook salmon produced in the Stanislaus, Tuolumne and Merced rivers and hatchery-raised Chinook salmon from the Merced River Fish Facility. Data are reported as the daily catch of unmarked and marked salmonid in the day's tows (nominally ten tows per day).

#### Delta Monitoring

The FWS conducts beach seining at sites in the north, central, and south Delta throughout the year. This monitoring detects salmonid presence in the Delta. The FWS operates a trawling operation in the vicinity of Chipps Island a minimum of three days a week, year round. This operation detects salmonids downstream of the Delta. Continuous monitoring of salmonid salvage and loss (including frequency and methods) at Skinner Fish Protection Facility and Tracy Fish Collection Facility is conducted per ongoing procedures established by the FWS 2008 and NMFS 2009 BiOps.

Salvage monitoring, the lower Sacramento River beach seine and trawl, as well as beach seining in the north, central, and west Delta continue during the summer period. The Delta Operation for Salmon and Sturgeon technical team (DOSS, established to manage salmonid and sturgeon in the Delta) typically does not meet during the summer, but monitoring of ESA-listed salmon and sturgeon movements occur in the Delta during the summer. If the Sacramento Catch Index of older juvenile salmon is greater than 3 during this period, DOSS will evaluate the information, then identify and implement measures to avoid or minimize any impacts of JPOD on salmon survival. If the DOSS cannot reach agreement on implementing mitigation measures, they will elevate the issue to the Water Operations Management Team (WOMT) for further discussion. (The Sacramento Catch Index, or SCI, is the combined catch of one day of seining the mainstem between Verona and Garcia Bend, and one day of trawling the mainstem near Sacramento, normalized to a standard sampling effort for the preceding two days of sampling, or three days if sampling with either gear missed a day).

#### **Salmon-related Criteria for Element (a) of JPOD, October-June:**

- i) Reclamation and DWR will ensure that the aforementioned monitoring components—Knights Landing rotary screw trap, Mossdale trawl, beach seining, trawling in the vicinity of Sacramento and Chipps Island, operations and entrainment monitoring at the Skinner Fish Protection Facility and Tracy Fish Collection Facility—are in place for JPOD to occur.
- ii) If the appropriate monitoring and data processing do not occur, then JPOD diversions will

discontinue until the monitoring and data processing are resumed.

- iii) Unless otherwise approved by the Executive Director of the SWRCB, JPOD operations will not begin or, if ongoing, will cease if any of the following conditions occur:
- a) Combined daily State Water Project (SWP)/Central Valley Project (CVP) loss density of older juvenile wild Chinook salmon or wild steelhead is greater than eight per thousand acre-feet (8 fish/TAF); or
  - b) For specified groups of Coleman National Fish Hatchery coded wire tag (CWT) late fall-run Chinook salmon (i.e., the surrogates for yearline spring-run Chinook salmon) or hatchery winter-run Chinook salmon cumulative loss is greater than or equal to 0.5%; or
  - c) Daily SWP/CVP loss density of older juvenile wild Chinook salmon is greater than or equal to 2% of the winter-run Chinook juvenile production estimate divided by 2000 (minimum=2.5 fish/TAF); or
  - d) Daily catch of juvenile salmon in trawling (standardized to 10 tows) at Mossdale on the San Joaquin River is greater than or equal to 5; or
  - e) Daily catch index of juvenile salmon at Knights Landing and/or Sacramento Trawl on the Sacramento River is greater than or equal to 5.

***Element (b):***

*Minimum survival levels for Chinook salmon, which shall be used to trigger consultation with fishery agencies regarding data evaluation and decision making to minimize or avoid the impact of pumping at Banks/Tracy Pumping Plant. Identify the consultation process that will be used if triggers are hit and identify the parties who will consult, how they will be notified, and a time schedule for decision-making.*

Chinook Salmon

Because methods for directly measuring the abundance or survival rate of Chinook salmon in the Delta have not been devised, survival levels for Chinook salmon will be based on population estimates in the upstream areas with allowances for direct loss in the Delta as a percentage of the upstream population. These survival levels are consistent with the allowable loss levels identified in the NMFS 2009 BiOp incidental take statement. During October through June, the NMFS 2009 BiOp's actions for protecting fish at Banks and Tracy Pumping Plants are in effect, and the salvage criteria of eight older juvenile wild Chinook salmon per thousand acre-feet of exports (8 fish/TAF) will serve as a protective trigger for JPOD.

Winter-Run

The loss number of juvenile winter-run Chinook triggering re-consultation will continue to be determined by NMFS each year based on winter-run escapement and/or juvenile passage past Red Bluff. An estimate of winter-run Chinook juveniles entering the Delta is calculated annually

from the adults salmon escapement estimate in the upper Sacramento River. NMFS determines the incidental take level for the CVP/SWP Delta pumps based on certain percentage (less than **one** percent of the yearly juvenile production) of the population being exposed to the influence of Delta export pumping.

Reclamation and DWR will monitor the loss of juvenile Sacramento River winter-run Chinook salmon (identification **initially** based on size-at-date criteria) at the CVP and SWP Delta pumping facilities and will use that information to determine whether the anticipated level of loss is likely to exceed the authorized level of **1%**, cumulatively, of the estimated number of juvenile Sacramento River winter-run Chinook salmon entering the Delta annually.

Because race classification by genetics (especially for winter-run Chinook salmon) is more accurate than the classification based on length-at-date tables (which can result in false positive assignments), DWR and Reclamation have developed a rapid genetic testing protocol. **The objective of the protocol is to process genetic samples that were collected from older juvenile salmonids salvaged at the SWP and CVP as soon as practicable after an older juvenile wild Chinook salmon loss density trigger has been exceeded, to assess the race assignment that was based on the existing length-at-date table in order to avoid or minimize the duration of export reductions that were triggered by loss of fish designated in this size range that were not genetic winter-run.** Actions to reduce pumping at the CVP and SWP export facilities are initiated when the older juvenile Chinook salmon trigger threshold is exceeded. However, if results of tissue genetic analysis indicate that the loss or loss density of genetic winter-run Chinook salmon did not exceed the trigger threshold, then export reductions will be cancelled.

If Reclamation, DWR, or NMFS determines the cumulative loss of wild winter-run Chinook salmon has exceeded **1%**, Reclamation and DWR shall immediately convene the WOMET to explore additional measures which can be implemented to reduce the rate of take and ensure the identified 1% level of take is not exceeded. If either agency or NMFS determines the rate of loss is sufficiently high that the estimated loss will likely exceed the **2%** identified level or if the cumulative loss exceeds **2%**, consultation shall be reinitiated immediately, and JPOD will not occur as long as winter-run salmon continue to be salvaged at either facility.

### Spring-Run

NMFS will identify the specific surrogate release group(s) to be used each year for the 1% loss in the incidental take statement. Reclamation and DWR will monitor the loss of identified Central Valley spring-run Chinook salmon surrogate release groups at the CVP and SWP Delta pumping facilities and use that information to determine whether the cumulative estimated level of loss is expected to exceed 1%. If the estimated cumulative loss of the release group approaches 0.5%, Reclamation and DWR shall immediately convene the WOMET to explore additional measures which can be implemented to reduce the rate of take. If either agency or the NMFS determines that the rate of loss is sufficiently high that the estimated loss will likely exceed the 1% level or if the cumulative loss exceeds 1%, consultation shall be reinitiated immediately and members of the WOMET notified immediately by email, telephone, or fax, and JPOD will not occur as long as spring-run Chinook salmon surrogates (or spring-run Chinook salmon if identification becomes feasible) continue to be salvaged at either facility.

During the July through September timeframe, salmon entrainment is expected to be negligible.

However, salmon loss data from the SWP and CVP fish facilities will be evaluated routinely and FWS, NMFS, and DFW consider the loss of five older juvenile salmon per TAF of exported water as a trigger for consideration of actions to avoid or minimize impacts of JPOD on salmon survival. In the event that the July through September trigger is hit, JPOD will cease and shall not resume until the daily loss density falls below the triggering level or unless an appropriate action to reduce the rate of loss is agreed to by the FWS, NMFS, DFW and the Executive Director of the SWRCB, and is implemented.

The WOMT agencies (Reclamation, DWR, DFW, FWS, & NMFS) will confer via the **DOSS**, **SRTTG**, or WOMT within 24 hours of exceeding a loss density trigger. A subsequent Delta Conditions Team (**DCT**) conference call will be used to inform and exchange information between the WOMT agencies and with stakeholders. Notification to the **DCT** shall be via email, phone, or fax. WOMT agencies shall have a maximum of an additional 24 hours to reach decisions on mitigation measures and to develop recommendations on continuation of JPOD.

#### Salmon-related Criteria for Element (b) of JPOD:

- i) If Reclamation, DWR, or NMFS determine the rate of salmon loss has exceeded a specified trigger, Reclamation and DWR shall immediately convene the WOMT to identify and implement measures to reduce the rate of take. The agencies (Reclamation, DWR, DFW, FWS, and NMFS) will use the DCT/WOMT process to notify stakeholders and to develop recommendations on continuation of JPOD.
- ii) If Reclamation, DWR, or NMFS determines the rate of loss is sufficiently high that the estimated loss will likely exceed an incidental take level, consultation shall be reinitiated immediately, members of the WOMT notified immediately by email, telephone, or fax, and JPOD diversions will cease.
- iii) From October through June, the NMFS **2009 BiOp actions** in the Delta will take effect. If the daily SWP or CVP loss density of older juvenile salmon is greater than eight per thousand acre-feet of exported water (8 fish/TAF), JPOD operations will not begin or, if ongoing, will cease until the loss rate subsides.
- iv) From July through September, if the loss of older juvenile salmon is greater than five per thousand acre-feet of exported water (5 fish/TAF), JPOD operations will not begin or, if ongoing, will cease unless an appropriate action, approved by DFW, FWS, NMFS, and the Executive Director is implemented.

#### Delta Smelt

The period of concern for JPOD impacts to Delta Smelt is primarily December through July. Specific monitoring requirements and CVP and SWP operational requirements to protect Delta Smelt are contained in the **2008** Biological Opinion for Delta Smelt from FWS on the long term Central Valley Project and State Water Project Operations Criteria and Plan (FWS 2008 BiOp). Actions to protect Delta Smelt from impacts of JPOD operations will be evaluated similar to other CVP and SWP operations in accordance with the FWS **2008** BiOp. The FWS **2008** BiOp relies on an adaptive management process



facilitated through the Delta Smelt Working Group (SWG) with assistance from others. The SWG evaluates biological and technical issues regarding Delta Smelt and develops recommendations for consideration by FWS which may include advice on reducing entrainment risk through operational changes. Information used by the SWG includes the most recent data on population status, relative abundance and distribution, sexual maturation, Delta conditions, cumulative salvage, and current operations. The FWS staff and managers review the recommendation and, if warranted, use it to develop a determination for modification of water operations that will minimize adverse effects caused by Project operations. This adaptive process continues throughout the winter and spring until smelt are no longer vulnerable to entrainment. The *Summary Report on the Transactions of the Smelt Working Group in Water Year 2016* presents actions that will be implemented to protect Delta Smelt (Table 1).

Table 1. Component 1 (Actions 1 and 2) and Component 2 (Action 3) of the BiOp's RPA

		Objective	Trigger	Timing	OMR Flows
Component 1	Action 1 (a)	A fixed duration action to protect pre-spawning adult Delta Smelt from entrainment during the first flush and to provide advantageous hydrodynamic conditions early in the migration period.	SWG may recommend a start date	Dec 1 to Dec 20	-2,000 cfs
	Action 1 (b)		Turbidity or Salvage	Dec 20 to Action 2	
	Action 2	An action implemented using an adaptive process to tailor protection to changing environmental conditions after Action 1. As in Action 1, the intent is to protect pre-spawning adults from entrainment and, to the extent possible, from adverse hydrodynamic conditions	The end of Action 1 or (if Action 1 is not triggered), the SWG may recommend a start date	Immediately following Action 1	-1250 to -5000 cfs
Component 2	Action 3	Minimize the number of larval Delta Smelt entrained at the facilities by managing hydrodynamics in the central Delta flow levels pumping rates spanning a time sufficient for protection of larval Delta Smelt. The action is adaptive and flexible within appropriate constraints	Temperature or Onset of Spawning	Upon meeting trigger criteria	

When the ~~DSRAM~~-adult salvage concern level is reached or exceeded, the SWG will convene a meeting to discuss and recommend what actions, if any, should be taken to reduce salvage. Under this condition, JPOD may only be used with specific approval of the DFW, FWS, NMFS and the Executive Director. When the allowable level of incidental take specified in the FWS 2008 BiOp is met or exceeded, FWS will determine whether re-initiation of consultation is warranted. JPOD will not occur in the event that the authorized incidental take is exceeded.

The FWS 2008 BiOp contains a requirement that the following surveys continue to be conducted to

determine abundance and distribution of Delta Smelt: Spring Kodiak trawl, 20-mm survey, summer townet survey, and fall midwater trawl survey. Monitoring also includes sampling Delta Smelt salvaged at Tracy and Banks pumping plants fish facilities.

In 2013, the FWS, with the cooperation of other state and federal water agencies, began an Early Warning Monitoring Program which provided FWS and state and federal water managers valuable, near real-time information about the location of Delta Smelt. This program was intended to give water project managers additional time to modify pumping operations should the imperiled fish move closer to water diversions in the southern Delta. Late in 2016 the Enhanced Delta Smelt Monitoring Program (EDSM) replaced the Early Warning Monitoring Program and included a broader sampling area with increased overall effort, and estimates on Delta Smelt abundance.

Newly hatched Delta Smelt are not effectively sampled at the SWP or CVP fish facilities. Their presence can be inferred from the appearance of spent female smelt in samples at or in the vicinity of the SWP/CVP diversions. Ripe female smelt indicate larvae will be present soon. Because these larvae are highly susceptible to the flow effects of export pumping, increased pumping using JPOD will not be approved by the fish agencies when the presence of small larvae in the southern Delta can be reasonably inferred from available information. An exception may be made if there is adequate net downstream flow in Old and Middle rivers.

The 2008 FWS BiOp notes that most JPOD pumping occurs in the summer and fall, when Delta Smelt are not likely to be present in the southern Delta. When this is true, Delta Smelt entrainment at the export facilities is not likely to increase as a result of the JPOD pumping. Nevertheless, JPOD pumping will not occur unless FWS, DFW, NMFS (and Working Group, as necessary), through the WOMET, determine that fish in the Delta would not be harmed.

**Delta Smelt-related Criteria for Element (b) of JPOD:**

- i) JPOD will only occur when the Management Agencies determine that Delta Smelt in the Delta would not be harmed. When the adult salvage concern level is met or exceeded, the SWG will convene a meeting to discuss and recommend what actions, if any, should be taken to reduce salvage. If the concern level has been exceeded, JPOD may only be used with specific approval of the DFW, FWS, NMFS and the Executive Director.
- ii) In the event that the Delta Smelt incidental take is exceeded, JPOD operations will not begin or, if ongoing, will cease.

***Element (c):***

*Specific measures at Trinity, Shasta, or Folsom reservoirs to avoid or minimize adverse effects to Chinook salmon and steelhead if upstream or Delta monitoring indicates that such impacts are occurring.*

Potential negative effects to Chinook salmon and steelhead upstream of the Delta include: reduction in reservoir cold water supply when river water temperature is or subsequently could be above the preferred range for various life stages of salmonids, early emigration of fry, increased predation rates, and de-watered redds or stranded fish when flows fluctuate.



The existing flow and temperature requirements for salmonids on the Trinity, Sacramento, American, and Stanislaus rivers remain in effect during JPOD operations. Operations forecasts will be updated on a monthly basis to determine the likelihood that adverse temperatures or flow fluctuations will occur when JPOD is occurring or is proposed. Modeling of project operations and temperature operations will be discussed among the project agencies and management agencies at the **SRTTG, American River Group (ARG), and Stanislaus Operations Group (SOG)** meetings. Mitigation to reduce potential impacts includes halting the use of JPOD, rescheduling JPOD, or not starting JPOD. If unforeseen impacts were to result from JPOD, then mitigation could include seining fish from stranding areas and returning them to the river, maintaining releases to the affected river to avoid stranding, or using a power bypass if JPOD were to negatively affect Shasta or Folsom Reservoirs' cold water pool and Reclamation's ability to meet the temperature objectives.

Water temperature objectives for salmonids in the Sacramento and American Rivers include potential adjustments to the river reach where the target temperature is to be achieved (compliance points). If temperature modeling indicates that the temperature objectives established for operations without JPOD cannot be achieved through the temperature control season with JPOD, JPOD will not occur. An exception may be allowed if the fish agencies conclude, based on the current fish status and habitat conditions, that any expected increase in water temperature due to the proposed JPOD operation will not adversely impact aquatic resources in the affected river reach.

It is not anticipated that JPOD operations by the SWP will affect operations at Oroville Reservoir or Feather River flow since it is not expected that DWR would release water from SWP storage to export utilizing JPOD.

In the lower Sacramento River and Delta, criteria defined by the NMFS 2009 BiOp reasonable and prudent alternative will be followed if fish monitoring indicates that significant numbers of juvenile salmon are present in the lower Sacramento River or in the southern Delta. If the actions' criteria are approached or exceeded, the **DOSS or the DCT** will be convened within 24 hours to discuss and recommend appropriate measures to avoid or minimize impacts on Chinook salmon. The WOMET will act on any such recommendations as soon as possible but within 72 hours.

Responses to salmonid monitoring in the Delta are contained in Elements (a) and (b) above.

#### **Criteria for Element (c) of JPOD**

- i) If modeling or monitoring indicates that the use of JPOD would negatively affect the ability of the coldwater pool in Trinity, Shasta, or Folsom reservoirs to meet the needs of Chinook salmon or steelhead, then JPOD operations will not occur. A negative impact will be defined as the inability to meet the temperature objectives established for operations without JPOD or a change in the temperature objective (temperature target or compliance point) due to JPOD within habitat occupied by Chinook salmon or steelhead in the Sacramento, American, or Trinity Rivers. JPOD may proceed under this condition only if the change in the temperature objective due to JPOD operation is determined by the fish agencies not to be significant.
- ii) If modeling predicts that JPOD will result in flow fluctuations that result in significant loss of Chinook salmon or California Central Valley steelhead, then JPOD will not occur.

***Element (d):***

*Operating criteria to ensure that JPOD does not significantly impact aquatic resources in upstream areas due to changes in flow, water temperature, and reservoir water levels.*

As noted in Element (c) above, during JPOD operations, the existing flow and temperature requirements contained in the NMFS 2009 BiOp for CVP operations on the Trinity, Sacramento, Stanislaus and American Rivers will remain in force.

Water Rights Order 90-5 (WR 90-5) also contains water temperature, monitoring, and flow requirements for the Sacramento River and Trinity River. An operations plan is prepared and submitted to the SWRCB each year detailing the Sacramento River temperature operations and designating the appropriate temperature compliance point.

Reclamation will meet the temperature and ramping requirements in the NMFS 2009 BiOp on the Sacramento, Trinity, Stanislaus and American Rivers and the requirements in WR 90-5. Per the NMFS 2009 BiOp, Reclamation will target daily average water temperatures in the Sacramento River as follows: not in excess of 56°F at compliance locations between Balls Ferry and Bend Bridge from May 15 through September 30, and not in excess of 56°F at the same compliance locations between Balls Ferry and Bend Bridge from October 1 through October 31, provided operations and temperature forecasts demonstrate the capability to achieve and sustain compliance. During periods outside of flood control operations and to the extent controllable during flood control operations, Reclamation shall ramp down releases from Lewiston, Keswick, Nimbus, and Goodwin Dams in accordance with ramping requirements.

On the American River, Reclamation will develop a water temperature management plan for review and approval by NMFS. The draft annual temperature management plan will be submitted by Reclamation for review by NMFS not later than May 1 of each year. In the development of that annual temperature management plan, Reclamation will seek input from the ARG.

Due to the relatively small capacity and the limited cold water pool at Folsom Reservoir, Shasta Reservoir will typically be the primary source of water for the CVP's use of JPOD in most years during balanced conditions. Releases from Keswick Reservoir will be adjusted to support the changes in export pumping due to the increment of JPOD pumping at Banks, with travel time considered. Nevertheless, it should be noted that changes in accretions/depletions, temperature operations, and applicable regulatory standards over the period of JPOD, will require Shasta and Folsom release changes that are not related to JPOD pumping.

If system operations modeling, temperature modeling, or real-time fish, water level, or temperature monitoring indicates that JPOD operations will have a negative affect on any of the above criteria, the DCT or DOSS will be convened within 24 hours to evaluate whether JPOD exports should be curtailed.

**Criteria for Element (d) of JPOD**

- i) Project operations under JPOD must meet the fish protection temperature and flow objectives on the Sacramento River, American River, and Stanislaus River contained in Attachment 2, WR 90-5, and as described under Element c above.
- ii) If system operations modeling, temperature modeling, or real-time fish or habitat monitoring

indicates that JPOD operations will have a significant negative effect on any of the above criteria, the DAT or B2IT will be convened within 24 hours to evaluate whether JPOD exports should be curtailed.

***Element (e):***

*Specific measures to protect other legal users of water.*

JPOD operations have the potential to reduce water surface levels or change water quality conditions in the south Delta. They also have the potential to impact the ability to manage instream temperatures below the source reservoirs. To protect other legal users of water, Reclamation and DWR will coordinate with other water users prior to and during JPOD operations.

DWR and Reclamation already have two response plans (i.e., Water Level Response Plan and Water Quality Response Plan) in place to protect south Delta diverters from water surface level and water quality impacts due to Stage 1 or Stage 2 JPOD. As required by these response plans, south Delta diverters are notified via email at least seven days prior to a planned JPOD action. In anticipation of beginning or continuing JPOD operations, DWR produces and shares with interested parties weekly modeling results using Delta Simulation Model 2 (DSM2). The model predicts water surface levels and water quality, both with and without JPOD operations at a number of stations in the south Delta.

If a south Delta diverter were to object to planned JPOD diversions on the basis of shared model results, and DWR, Reclamation, and the diverter are unable to agree on operations of JPOD, then DWR and Reclamation will contact the SWRCB Chief of the Division of Water Rights for a determination of what, if any, mitigation is required for potential water quality impacts associated with JPOD operations.

During JPOD operations, DWR and Reclamation will monitor real-time electrical conductivity (EC) and water surface level data. If south Delta water quality standards are being met, and shared modeling analysis does not indicate future non-compliance, then the incremental JPOD effects to water quality shall be deemed acceptable. On the other hand, if water quality standards are not being met, or shared modeling analysis indicates the trend effect of JPOD is to degrade salinity conditions to the extent that the standards would not be met, then the effect of JPOD on South Delta water quality would be deemed unacceptable, and JPOD would not occur without other mitigation measures for salinity effects.

If, during JPOD operations, observed water surface levels drop below the minimum elevations described in the Water Level Response Plan, DWR and Reclamation will cease JPOD operations. DWR and Reclamation will also cease JPOD operations if notified that a diverter is experiencing problems diverting water in the south Delta due to low water surface levels.

In addition to complying with the terms of the water surface level and water quality response plans described above, DWR and Reclamation will discuss the potential for JPOD operations at least 14 days in advance at the regular WOMT meeting or by notification through the DCT group. These groups have representatives from about 30 stakeholder organizations.

Furthermore, Reclamation and DWR will provide the WOMT and the DCT with points of contact, and will post the same contact information on the CalFed Ops webpage, so that members of the public can reach Reclamation or DWR operators to report any problems which may arise due to JPOD. In the event that a legal water user alleges harm as a result of JPOD actions, Reclamation and DWR

will forward the allegation to the SWRCB and provide the water user an initial written response within 72 hours. Reclamation and DWR will attempt to verify that harm has resulted or is resulting specifically from JPOD operations, and if so, provide mitigation to the extent of the incremental impact due to JPOD. If such mitigation measures cannot be provided within a reasonable time frame, JPOD operations will cease. If allegations of harm are contested by the Reclamation and/or DWR or if effective incremental mitigation cannot be provided in a timely manner, the issue shall be immediately forwarded to the Executive Director of the SWRCB for resolution.

**Criteria for Element (e) of JPOD:**

- i) At least 14 days prior to beginning JPOD operations, the potential for such operation will be discussed at the regular **WOMT** group meeting or by notification through the **DCT**.
- ii) In implementing JPOD operations, DWR and Reclamation will comply with the conditions of the Water Level Response Plan and Water Quality Response Plan to protect Delta water users.
- iii) DWR and Reclamation will provide points of contact to the **WOMT** and the **DCT**, and these contacts will also be listed on the CalFed Ops web page.
- iv) An initial response to an allegation of harm from a legal user of water will be provided in writing within 72 hours by Reclamation and/or DWR staff. Reclamation and DWR will attempt to verify that harm has resulted or is resulting specifically from JPOD operations, and if so, provide mitigation to the extent of the incremental impact due to JPOD. If such measures cannot be provided within a reasonable time frame, JPOD operations will cease.
- v) All allegations of harm will be forwarded to the SWRCB. If allegations of harm are contested by Reclamation and/or DWR, or if effective incremental mitigation cannot be provided in a timely manner, the issue shall be immediately forwarded to the Executive Director of the SWRCB for resolution.

***Element (f):***

*Specific measures to mitigate significant effects on recreational and cultural resources at affected reservoirs.*

Recreational impacts shall be deemed to occur only when reservoirs which provide water for export under JPOD meet both of the following conditions:

1. Actual operations with JPOD are forecasted to draw affected reservoirs below the end of water year (Sept 30) storage which would have occurred under D-1485 with Federal replacement pumping; and
2. Actual operations with JPOD are forecasted to draw affected reservoirs below the useable elevation of the lowest boating access prior to Labor Day weekend.

Mitigation for significant recreational impacts may consist of actions such as installation of temporary boat launching facilities or temporary access points to the reservoir. In the event that DWR or Reclamation is unable to implement mitigation actions, JPOD operations will not occur.

Cultural resources have been evaluated and preserved during the pre-construction period and/or in the

1976-1977 and 1987-1992 periods when reservoirs were drawn down to historic minimums. JPOD will not occur when it would cause reservoirs to be drawn down to or below historic minimum elevations. Nevertheless, the USBR shall endeavor to protect and catalog any significant, newly identified cultural resources which may be discovered during JPOD operations. In addition, the USBR Regional Archaeologist or other designated staff will be provided with a copy of expected water surface elevations for affected reservoirs during the period of JPOD to ensure that previously identified cultural resources can be protected or further investigated as required.

An initial response to allegations of impacts to recreational and/or cultural resources shall be provided by the USBR or DWR in writing within 72 hours. Unresolved disputes shall be forwarded to the Executive Director of the SWRCB for resolution.

It is not anticipated that Stage 2 JPOD operations by the SWP will affect operations at Oroville Reservoir or Feather River flow.

**Criteria for Element (f) of Stage 2 JPOD:**

i) If JPOD operations are forecasted to draw affected reservoirs below: (1) the end of water year (Sept 30) storage which would have occurred under D-1485 with Federal replacement pumping, And (2) the useable elevation of the lowest boating access prior to Labor Day (weekend, then Reclamation and DWR would implement mitigation actions. These actions may include installing temporary boat launching facilities or temporary access points to the reservoir.

In the event that DWR or Reclamation is unable to implement mitigation actions, JPOD operations will not occur.

To protect cultural resources, JPOD will not occur when it would cause reservoirs to be drawn down to or below historic minimum elevations. Furthermore, Reclamation's Regional Archaeologist will be provided with a copy of expected water surface elevations for affected reservoirs during the period of a contemplated JPOD action to ensure that previously identified cultural resources can be protected or further investigated as required.

ii) An initial response to allegations of impacts to recreational and/or cultural resources shall be provided by the USBR or DWR in writing within 72 hours. Unresolved disputes shall be forwarded to the Executive Director of the SWRCB for resolution.