

February 25, 2004

## UPSTREAM RIVER RELEASES OCTOBER THROUGH SEPTEMBER

### Description

Upstream actions are intended to provide increased flows in the CVP-controlled streams of Clear Creek, Sacramento, American, and Stanislaus rivers for improved habitat conditions for anadromous and resident fish populations, including benefits to chinook salmon and steelhead upstream migration, spawning, egg incubation, rearing, and downstream migration.

### Purpose (Biological Benefits and Justification)

In general, the improved flows in CVP-controlled streams will: (1) provide improved spawning and rearing habitat for salmon and steelhead; (2) improve survival of downstream migrating chinook salmon smolts; (3) improve habitat conditions for white sturgeon, green sturgeon, American shad and striped bass to migrate upstream, spawn, and allow progeny to survive; (4) aid in the downstream transport of striped bass eggs and larvae; (5) improve water temperatures and increase habitat for rearing juvenile steelhead; and (6) benefit delta smelt and other estuarine species.

The rationale and scientific basis for the improved flows are found in a variety of sources (including AFRP documents, published literature, CDFG reports, and other restoration programs) and are generally based on results of instream flow and temperature studies conducted by the FWS, CDFG or others, as well as relationships between flow and adult returns, correlation analyses, and other life history information.

### Real-time Implementation Process

The flow objectives being targeted for each CVP-controlled stream are generally consistent with the AFRP's January 2001 Final Restoration Plan. These flow objectives are higher than the current existing minimum flow requirements in each stream. The flow objectives being targeted will be based on thresholds of CVP reservoir storage and forecasted inflow, and the amount of (b)(2) water available to meet the objectives. **The higher flow releases will be triggered by fisheries and hydrologic monitoring efforts. In general, spawning flows will be initiated in October or November when adult salmon are observed in the CVP-controlled streams and river temperatures are 60 degrees or less.**

Decisions regarding the modification of flow releases using (b)(2) and EWA water will be made in coordination with the DAT, B2IT, EWAT, the CALFED agencies and WOMT.

## **Delta Export Reductions in December 2003 and January 2004**

### **Description**

**Curtail total Delta Central Valley Project/State Water Project (CVP/SWP) exports during critical outmigration period (December and January) to increase survival of outmigrating juvenile salmonids from the Sacramento basin, including listed winter-run chinook, spring-run chinook, steelhead trout, and candidate late-fall and fall-run chinook. Adult delta smelt are also migrating upstream to spawning areas at this time.**

**An export reduction may also be necessary in December to evaluate the potential benefits of export curtailments to salmon survival in the Delta using coded-wire tagged (CWT) late-fall chinook salmon from Coleman National Fish hatchery (Delta Action 8).**

### **Purpose (Biological Benefits and Justification)**

**This action will increase the survival of juvenile chinook salmon smolts (including winter-run presmolts and spring-run yearlings) migrating through the Delta in the winter. It is scientifically supported by several years (1993-2002) of mark/recapture data that indicates the survival of juvenile late fall-run chinook salmon in the central Delta decreases as exports increase ( $r^2 = 0.36$ ,  $p < 0.05$ ). The 10-14 day evaluation in December is intended to document how decreasing exports will improve juvenile salmon survival through the Delta.**

**Further support for a curtailment is based on a recent analysis that indicates that December is an important migration period for winter-run pre-smolts, and that Delta Cross Channel (DCC) closures during December appear to be correlated with low winter-run salvage at the export facilities later in the year.**

### **Real-Time Implementation Process**

**The Management Agencies (FWS, NMFS, and CDFG) recommended a closure of the DCC beginning on December 1 to provide conditions to further define and evaluate the relationship between exports and juvenile survival in the central Delta during December and January. If CVP exports are reduced due to the DCC closure, (b)(2) assets will be used at the CVP. This export reduction will supplement the primary protective action of closing the DCC gates during this period.**

**Any additional Delta export reductions in December or January will be initiated by the CALFED Management Agencies in coordination with the Project Agencies (USBR and CDWR), the DAT, B2IT, EWAT, the CALFED agencies, and WOMT using the 2001 - 2002 juvenile salmon decision tree with its inherent trigger guidelines for DCC closure and export curtailment and consideration of Delta water quality conditions. Changes in**

hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process.

## Delta Export Reductions in

February and March 2004

### Description

Curtail total Delta Central Valley Project/State Water Project (CVP/SWP) exports during critical outmigration period (February and March) to increase survival of outmigrating juvenile chinook salmonids from the Sacramento basin with a focus on ESA listed winter-run chinook salmon and steelhead trout. Adult delta smelt are also migrating upstream to spawning areas at this time.

### Purpose (Biological Benefits and Justification)

This action will increase the survival of juvenile salmonid smolts migrating through the Delta in the late winter. It is scientifically supported by several years (1993 - 2002) of mark/recapture data that indicates the survival of juvenile late fall-run chinook salmon in the central Delta decreases as exports increase ( $r^2 = 0.36$ ,  $p < 0.05$ ). These export reductions will supplement the primary protective action of closing the Delta Cross Channel (DCC) gates during this period. Curtailment of exports also decrease ESA incidental take of juvenile winter-run salmon and spawning adult delta smelt when these species are in the south/central Delta.

### Real-Time Implementation Process

Delta export reductions will be initiated by the CALFED Management Agencies, (FWS, CDFG and NMFS) in coordination with the Project Agencies, (USBR and CDWR) by following the delta smelt decision tree and the 2001 - 2002 juvenile salmon decision tree which includes trigger guidelines for export curtailment. The plan is expected to include short term (5 day) export curtailments when abundance peaks of delta smelt or larger sized salmon and steelhead reach trigger levels at Knights Landing, Sacramento, and/or the CVP/SWP fish facilities. Changes in hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process.

Decisions regarding the modification of export rates with (b)(2) and EWA water will be made in coordination with the DAT, B2IT, EWAT, the CALFED agencies and WOMT.

## **Delta Export Reductions in April and May 2004**

### **Description**

**Curtail total Delta CVP/SWP exports during April and May (critical outmigration period for juvenile fall-run chinook salmon). Specific flow releases from the Stanislaus, Tuolumne, and Merced rivers and specific export curtailments consistent with the San Joaquin River Agreement and Vernalis Adaptive Management Plan (VAMP) will occur during 31 days generally from mid-April to mid-May and include a barrier at the head of Old River.**

### **Purpose (Biological Benefits)**

**Consistent with the San Joaquin River Agreement and VAMP, this action will evaluate the relative effects of export and inflow to juvenile San Joaquin basin chinook salmon survival with the upper Old River barrier in place and assist in providing protection for both anadromous and estuarine species.**

**The scientific support for flow increases in the San Joaquin Delta is based on positive relationships between CWT juvenile smolt survival and Delta inflow and significant relationship between adult salmon escapement and spring flows 2 ½ years earlier ( $r^2 = 0.50$ ,  $p < 0.01$ ). The ratio of flow at Vernalis to Delta exports is significantly, positively correlated to the number of naturally spawning salmon 2 ½ years later ( $r^2 = 0.40$ ,  $p < 0.01$ ).**

**The escapement for the Stanislaus and Tuolumne River per unit of spring flow has decreased since combined operations of the CVP and SWP, indicating negative effects of Delta exports to San Joaquin basin salmon production. Correlation analyses indicate that inflow to the Delta, low tributary flows during smolt migration, and adult escapement levels below 1,000 fish account for most of the variation in salmon production in the Stanislaus and Tuolumne Rivers.**

**Closure of the barrier at the head of Old River in the April/May period is estimated to provide a two fold increase in the survival of San Joaquin basin juvenile salmonid outmigrants by keeping them in the mainstem San Joaquin River as indexed using CWT salmon mark/recapture data.**

### **Real-Time Implementation Process**

**From April 15 - May 15 implementation is consistent with VAMP. If sufficient (b)(2) or EWA water is available on May 15<sup>th</sup> the Management Agencies (FWS, NMFS, and CDFG), in coordination with the Project Agencies (USBR and CDWR) may request exports continue at some reduced stable level or allow exports to ramp up gradually between May 16<sup>th</sup> and June 1<sup>st</sup>. These additional days of reduced exports will provide additional protection for juvenile anadromous and resident estuarine species including delta smelt. If additional protection for either juvenile anadromous or resident species is needed prior to April 15, (b)(2) or EWA may be used for the modification of exports. Biological triggers based on incidental take and realtime monitoring in the Delta, consistent with the decision trees, are used to identify when additional fish protection is needed prior to and after the 31 day VAMP period. Changes in hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process.**

**Decisions regarding the modification of export rates with (b)(2) and EWA water will be made in coordination with the DAT, EWAT, B2IT, the CALFED agencies and WOMT.**

#### **Delta Export Reductions in June 2004**

##### **Description**

**Curtail total Delta CVP/SWP exports during June to decrease losses of juvenile delta smelt if incidental take approaches “red light”. Allow a gradual increase (ramp up) rather than a rapid increase of exports during June may be used to increase survival of both anadromous and resident estuarine species in the south/central Delta.**

##### **Purpose (Biological Benefits)**

**To reduce the effects of CVP/SWP export facilities on listed resident fish in the south Delta and to enable juvenile resident estuarine and anadromous species to migrate away from the export facilities where they are less vulnerable to direct loss and/or indirect mortalities associated with export operations. Data exists that indicates “incidental take” is greater when fish population densities are high near the export facilities or when exports increase. Additional information indicates that generally when export rate increases rapidly under low Delta inflow and fish densities are high in the south/central Delta that fish losses at the facilities can be great.**

##### **Real-Time Implementation Process**

**If sufficient (b)(2) or EWA water is available in June, the CALFED Management Agencies (FWS, CDFG, and NMFS), in coordination with the Project Agencies (USBR and CDWR) may request exports continue at some reduced stable level or ramp up exports gradually in June. This request will be guided by the level of incidental take or by other “biological triggers” consistent with the decision trees. Specific export levels in June will be coordinated through WOMT. Changes in hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process.**

**Decisions regarding the modification of export rates with (b)(2) and EWA water will be made in coordination with the DAT, B2IT, EWAT, the CALFED agencies and WOMT.**

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