Draft (b)(2) Operations Plan for Water Year 2007
December 13, 2006

UPSTREAM RIVER RELEASES OCTOBER 2006 THROUGH SEPTEMBER 2007

Description

Upstream actions are primarily 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. In some instances increased flows will occur to meet requirements in the Delta. (b)(2) fish actions are measured against pre-1992 base case operations.

Biological Benefits and Technical Basis for Actions

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) increase Delta outflow to the benefit of delta smelt and other estuarine species.

The rationale and scientific basis for the improved flows are found in a variety of sources including Anadromous Fish Restoration Program (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 are 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 F or lower.

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Decisions regarding the modification of flow releases using (b)(2) water will be made in accordance with Interior's May 2003 Decision and coordinated with the use of EWA water consistent with the Calfed process (B2IT, EWAT, DAT, and WOMT, et. al.).

Banked (b)(2) Water

Approximately 195,000 acre-feet of banked (b)(2) water from WY 2006 was carried over in Shasta Reservoir for use in WY 2007. This banked b2 water will be used to augment base case plus (b)(2) flow releases and accounted for separately from the WY 2007 (b)(2) allocation.

Delta Export Reductions in December 2006 and January 2007

Description

Curtail total Delta Central Valley Project/State Water Project (CVP/SWP) exports during critical emigration period (December and January) to increase survival of emigrating juvenile salmonids from the Sacramento basin, including listed winter-run Chinook, spring-run Chinook, steelhead trout, and candidate late-fall and fall-run Chinook.

An export reduction may also occur 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).

Exports may also be curtailed to protect adult delta smelt if decision criteria are met or as directed by the WOMT in response to real-time monitoring and/or Delta Smelt Working Group recommendations.

Biological Benefits and Technical Basis for Actions

This action will increase the survival of juvenile Chinook salmon smolts (including winter-run pre-smolts and spring-run yearlings) migrating through the Delta in the winter. It is scientifically supported by several years (1993-2005) of mark/recapture data that indicates that the survival of juvenile late fall-run Chinook salmon in the central Delta decreases as exports increase ($r2= 0.25$, $p<0.1$). The 10 - 14 day evaluation period in December is intended to document the extent to which decreasing exports improves the survival of juvenile salmon through the Delta.

Further support for a curtailment is based upon a recent analysis that indicates that the month of December is an important emigration period for winter-run pre-smolts, and that Delta Cross Channel (DCC) gate closures during December appear to be correlated with low winter-run salvage at the export facilities later in the year. Curtailed exports also decrease incidental take of pre-spawning adult delta smelt when they are in the south/central Delta.

Real-Time Implementation Process

The Management Agencies (FWS, NMFS, and CDFG) will likely recommend a closure of the DCC gates beginning in mid-December, 2006 to protect emigrating winter-run Chinook salmon as well as to provide suitable 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 gate 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 (FWS, CDFG, and NMFS) in coordination with the Project Agencies (USBR and CDWR), the B2IT, EWAT, DAT, the Calfed Operations Group, and WOMT using the juvenile salmon decision tree with its inherent trigger guidelines for DCC closure and export curtailment and consideration of Delta water quality conditions, consistent with the Calfed process.

Recommendations pertaining to delta smelt will be based upon the delta smelt decision process (DSRAM) or as directed by the WOMT in response to real-time monitoring and/or Delta Smelt Working Group recommendations. Changes in hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process

The Delta Smelt Working Group made a preliminary recommendation to implement a proactive winter action to address concerns about wintertime entrainment of adults during "first flush" conditions. No action will likely be needed until after December 25th and after Delta water temperatures drop below 13º C (compiled from data from Mossdale, Antioch and Rio Vista). Once time and temperatures are appropriate for smelt spawning movements, Sacramento River flow at Freeport increases above 25,000 cfs should trigger operational changes to achieve flows in lower Old and Middle Rivers no more negative than -3500 cfs until February 15th. If no Sacramento River pulse above 25,000 cfs occurs by January 15th then Old and Middle River flows should be moderated as much as possible until February 15th. This recommendation reflects conditions which the Working Group believes are likely to minimize salvage of pre-spawning adult delta smelt, but if high salvage occurs other actions may be warranted.

If flows on the Sacramento River are above 25,000 cfs prior to Dec 25th, and remain above 25,000 cfs through Feb 15th no action should be necessary, but monitoring will be necessary. The Working Group will continue to monitor conditions in the Delta and survey sampling results to determine whether further refinements to the recommendation are needed.

Salvage of adults or other conditions suggesting that adults are spawning in the South Delta are an indicator that springtime actions may also be beneficial. If salvage is low and flows in Old and Middle Rivers are not strongly negative in January and February, then springtime actions might not be warranted.

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Delta Export Reductions in February and March 2007

Description

Curtail total Delta Central Valley Project/State Water Project (CVP/SWP) exports during critical emigration period (February and March) to increase survival of emigrating juvenile salmonids from the Sacramento basin, with a focus on ESA-listed winter-run Chinook salmon and steelhead trout. Exports may also be curtailed to protect adult and/or larval delta smelt if decision criteria are met or as directed by the WOMT in response to real-time monitoring and/or Delta Smelt Working Group recommendations.

Biological Benefits and Technical Basis for Actions

This action will increase the survival of juvenile salmonid smolts emigrating through the Delta in the late winter. It is scientifically supported by several years (1993 - 2005) of mark/recapture data that indicates survival of juvenile late fall-run Chinook salmon in the central Delta decreases as exports increase ($r2 = 0.25$, $p<0.1$). These export reductions will supplement the primary protective action of closing the DCC gates during this period. Curtailed exports also decrease incidental take of juvenile winter-run Chinook salmon and spawning adult delta smelt when these species are in the south/central Delta.

Real-Time Implementation Process

Delta export reductions will be recommended by the Calfed Management Agencies, (FWS, CDFG and NMFS) in coordination with the Project Agencies, (USBR and CDWR) by following the delta smelt decision process (DSRAM) and the juvenile salmon decision tree, which includes trigger guidelines for export curtailment. Recommendations pertaining to delta smelt will be based on the delta smelt decision process (DSRAM), or as directed by the WOMT in response to real-time monitoring and/or Delta Smelt Working Group recommendations. Changes in hydrologic conditions and/or real-time monitoring data may result in modifications to the implementation process.

Decisions regarding the modification of flow releases using (b)(2) water will be made in accordance with Interior's May 2003 Decision and coordinated with the use of EWA water consistent with the Calfed process (B2IT, EWAT, DAT, and WOMT, et. al.).

Delta Export Reductions in April and May 2007

Description

Curtail total Delta CVP/SWP exports during April and May (critical emigration 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 may include a barrier at the

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head of Old River. Exports may also be curtailed to protect adult and/or juvenile delta smelt if decision criteria are met or as directed by the WOMT in response to real-time monitoring and/or Delta Smelt Working Group recommendations.

Biological Benefits and Technical Basis for Actions

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 or without the upper head of 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 ($r2 = 0.50$, $p < 0.01$). The ratio of flow at Vernalis to Delta exports is significantly, positively correlated to the number of naturally spawning salmon 2 ½ years later ($r2 = 0.40$, $p < 0.01$). 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. 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 emigrants by keeping them in the mainstem San Joaquin River as indexed using CWT salmon mark/recapture data. Curtailed exports also decrease incidental take of juvenile delta smelt when they are in the south/central Delta.

Real-Time Implementation Process

From April 15 - May 15 implementation is consistent with VAMP. 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. If sufficient (b)(2) or EWA water is available on May 15th 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 16th and June 1st. These additional days of reduced exports will provide additional protection for juvenile anadromous and resident estuarine species including delta smelt. Biological triggers based on incidental take and real-time monitoring in the Delta, consistent with the juvenile salmon decision tree and delta smelt decision process (DSRAM), 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 flow releases using (b)(2) water will be made in accordance with Interior's May 2003 Decision and coordinated with the use of EWA water consistent with the Calfed process (B2IT, EWAT, DAT, and WOMT, et. al.).

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Delta Export Reductions in June 2007

Description

Curtail total Delta CVP/SWP exports during June to decrease losses of juvenile delta smelt if incidental take approaches concern levels, as specified in the delta smelt decision process (DSRAM). Exports may also be curtailed to provide additional protection for juvenile San Joaquin fall-run Chinook if monitoring indicates continued emigration in June. Also, 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.

Biological Benefits and Technical Basis for Actions

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 move 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 that incidental take is greater when fish population densities are high near the export facilities or when exports increase. Additional information indicates that fish losses at the Delta facilities can increase when fish densities are high and export rates increase rapidly under low Delta inflow.

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 recommend that exports continue at some reduced stable level or ramp up exports gradually in June. This recommendation will be guided by the level of incidental take or by other real-time indicators consistent with the juvenile salmon decision tree and delta smelt decision process (DSRAM). 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 flow releases using (b)(2) water will be made in accordance with Interior's May 2003 Decision and coordinated with the use of EWA water consistent with the Calfed process (B2IT, EWAT, DAT, and WOMT, et. al.).

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