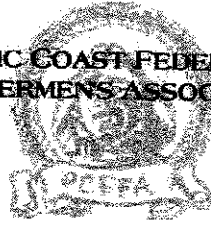
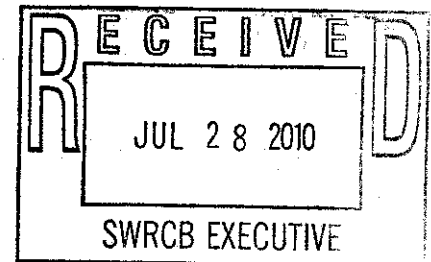


PACIFIC COAST FEDERATION  
of FISHERMENS ASSOCIATIONS



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28 July 2010

Charles R Hoppin, Chair, and Members  
State Water Resources Control Board  
Sacramento, CA 95812-2000

Dear Chairman Hoppin and Members of the Board

Per your 21 July 'Notice of Availability of Draft Report on the Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem' the Pacific Coast Federation of Fishermen's Associations (PCFFA) and Institute for Fisheries Resources (IFR) submit these comments concerning your Draft Report.

PCFFA is the largest organization of commercial fishermen on the Pacific Coast. Our port-based member associations range from San Diego north to Alaska. IFR is a public-service research organization associated with PCFFA for the purpose of undertaking studies and other initiatives aimed at improving fishery management and the conservation of the nation's public trust fish resources.

PCFFA, through the testimony given on 23 March of this year by IFR's senior science advisor Bill Kier, provided information to the Board's proceedings concerning the streamflow and water quality requirements of Sacramento River fall-run chinook salmon.

Sacramento River fall-run chinook salmon have supported an ocean salmon fishery upon which many California, Oregon and Washington communities have depended for more than a century. These salmon have provided a living not only for the region's working fishermen and fisherwomen, but for a once-vibrant sports-fishing industry and a coastal tourism industry sustained significantly by the presence of salmon – salmon boats, salmon fishermen, salmon fishing, and seafood restaurants serving what is known worldwide as one of the most delicious and wholesome foods on earth, fresh California troll-caught king ('chinook') salmon.

Tragically, this gift of nature, the once-robust Sacramento River fall-run chinook salmon resource and the significant economic contribution that it has made to so many California communities from Santa Barbara to Redding to Eureka and beyond, has been decimated in

**STEWARDS OF THE FISHERIES**

just a handful of years by what mounting evidence suggests have been excessive freshwater withdrawals from the San Francisco Bay-Delta estuary ecosystem.

These excessive freshwater withdrawals from the Bay-Delta estuary ecosystem have been sanctioned by your Board.

California's commercial salmon fishery was shut down altogether in 2008 and 2009, and is limping along this year due to the falling numbers of fall-run chinook salmon that have returned to the Sacramento River. Rule-making under the federal Fishery Conservation and Management Act requires that at least 122,000 fall-run chinook salmon return to the Sacramento River in order for there to be a fishery for them. The returns have been as low as 39,000 during the recent closure period.

The goal of rebuilding the Sacramento River fall-run chinook salmon public trust resource is explicit policy of the State, as set forth in Fish & Game Code Section 6900 et seq., the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act; the SWRCB's 2006 Bay-Delta Plan; and the federal Central Valley Project Improvement Act of 1992.

The State Water Resources Control Board has a clear duty under law to protect the public trust resources of the San Francisco Bay-Delta estuary ecosystem. Protection of this estuary, the most important estuary on the Pacific coast of North and South America, was an explicit reason for the creation of your Board in 1967.

The Legislature has directed your Board to develop "flow criteria for the Delta ecosystem necessary to protect public trust resources." (Attachment 1, excerpt from SB 1 X7, 2009)

This is a task that your Board should have performed long before now given that you were explicitly directed by the court 27 years ago to consider the protection of public trust resources in your rule-making (33 Cal. 3d 419; 658 P.2d 709 (1983)).

We will restrict our comments on the Draft Report to its adequacy to protect the Sacramento River fall-run chinook salmon public trust resource.

We believe the staff has made inadequate use of the best available science in setting out the flow criteria needed for rebuilding Sacramento River fall-run chinook salmon as directed in the State and federal laws cited above.

Specifically, we direct your attention to page 53 of the Draft Report where it states "No specific Delta outflow criteria are recommended for Chinook salmon. Any flow needs would generally be met by the following inflow recommendations and by the Delta outflow criteria determined for estuarine dependent species discussed elsewhere in this report." (Attachment 2)

Chairman Chas. Hoppin and Members  
State Water Resources Control Board  
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The Delta inflow criteria advanced in the Draft Report draws correctly upon expert testimony provided by the U.S Fish & Wildlife Service's Dr Martin Kjelson concerning the relationship between Sacramento River flows, as measured at Rio Vista, and chinook salmon smolt survival as measured at Chipps Island at the eastern entrance to Suisun Bay.

Clearly the finding by Dr Kjelson that flows measured at Rio Vista in the range of 20,000 to 30,000 cfs are necessary to provide safe passage for out-migrating chinook salmon smolts implies that somewhat similar flows are necessary to move the smolts past Chipps Island safely into Suisun Bay.

This is the reason that PCFFA/IFR recommended in its testimony to the Board (see Attachment 4) that "a minimum of 25,000 cfs of Sacramento River flow past all points of diversion, present or future, from an upstream point at Freeport to a downstream point at Chipps Island from 1 April to 30 June of each year" be provided for levels of survival - 'safe passage' - of juvenile Sacramento River fall-run chinook salmon smolts across the Delta, sufficient for the rebuilding of this public trust resource.

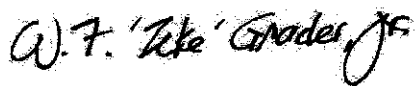
We recommend that the language at 'Delta Outflow' at page 53 of the Draft Report be amended to read:

"Delta Outflow"

Delta outflow to Suisun Bay during the principal emigration period for Sacramento River fall-run juvenile salmon, April through June, should be no less than that set out in Section 5.2 concerning Sacramento River inflow criteria, or approximately 25,000 cfs"

We appreciate this opportunity to comment on, and to strengthen the Draft Report.

Sincerely,



Wm. F. 'Zeke' Grader, Jr  
Executive director  
Pacific Coast Federation of Fishermen's Assns.

Attachments (4)

Attachment 1  
PCFFA Comments, 7-20-10  
SWRCB Draft Delta Flow Criteria

Excerpt from Senate Bill 1, 7<sup>th</sup> Extraordinary Session of the California Legislature, as enrolled November 4, 2009 :

85085. (c) (1) For the purpose of informing planning decisions for the Delta Plan and the Bay Delta Conservation Plan, the board shall, pursuant to its public trust obligations, develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. In carrying out this section, the board shall review existing water quality objectives and use the best available scientific information. The flow criteria for the Delta ecosystem shall include the volume, quality, and timing of water necessary for the Delta ecosystem under different conditions. The flow criteria shall be developed in a public process by the board within nine months of the enactment of this division. The public process shall be in the form of an informational proceeding conducted pursuant to Article 3 (commencing with Section 649) of Chapter 1.5 of Division 3 of Title 23 of the California Code of Regulations, and shall provide an opportunity for all interested persons to participate. The flow criteria shall not be considered predecisional with regard to any subsequent board consideration of a permit, including any permit in connection with a final BDCP.

survival and abundance have been developed using tributary inflows rather than Delta outflows, however, the Delta is an extension of the riverine environment until salmon reach the salt water interface. (DOI 1, p. 29.) Prior to development and channelization, the Delta provided hospitable habitat for salmon. With channelization and other development, the environment is no longer hospitable for salmon. As a result, the most beneficial Delta outflow pattern for salmon may currently be one that moves salmon through the Delta faster. (*d.*)

Salmon respond behaviorally to variations in flows. Monitoring shows that juvenile and adult salmon begin migrating during the rising limb of the hydrograph. (DOI 1, p. 30.) For juveniles, pulse flows appear to be more important than for adults. (*id.*) For adults, continuous flows through the Delta and up to each of the natal tributaries appears to be more important. (*id.*) Flows and water temperatures are also important to maintain populations with varied life history strategies in different year types to insure continuation of the species over different hydrologic and other conditions. For salmon migrating as fry within a few days of emigration from redds, increased flows provide improved transport downstream and improved rearing habitat, and for salmon that stay in the rivers to rear, increased flows provide for increased habitat and food production. (DOI 1, 30.)

### **Population Abundance Goal**

The immediate goal is to significantly improve survival of all existing runs of Chinook salmon that migrate through the Delta in order to facilitate positive population growth in the short term and subsequently achieve the narrative salmon protection objective identified in the 2006 Bay-Delta Plan to double the natural production of Chinook salmon from the average production from 1967 to 1991 consistent with the provisions of State and federal law. (State Water Board 2006a, p. 14.)

### **Species- Specific Recommendations**

#### Delta Outflow

No specific Delta outflow criteria are recommended for Chinook salmon. Any flow needs would generally be met by the following inflow recommendations and by the Delta outflow criteria determined for estuarine dependant species discussed elsewhere in this report.

#### Sacramento River Inflows

The 2006 Bay-Delta Plan includes flow objectives for the Sacramento River at Rio Vista for the protection of fish and wildlife beneficial uses from September through December ranging from 3,000 to 4,500 cfs. (State Water Board 2006a, p. 15.) These flow objectives are in part intended to provide attraction and transport flows and suitable habitat conditions for Chinook salmon. (State Water Board 2006b, p. 49.) The 2006 Bay-Delta Plan includes Delta outflow objectives for the remainder of the year, which effectively provide Sacramento River inflows. However, the Bay-Delta Plan does not include any specific Sacramento River flow requirements for the remainder of the year, including the critical spring period.

Habitat alterations in the Delta limit Sacramento River salmon production primarily through reduced survival during the outmigrant (smolt) stage. Decreases in flow through the estuary, increased temperatures, and the proportion of flow diverted through the Delta Cross Channel and Georgiana Slough on the Sacramento River are associated with lower survival in the Delta of marked juvenile fall-run Sacramento River salmon. (DOI 1, p. 24.) In 1981 (p. 17-18) and 1982 (p. 404), Kjelson *et al.* reported that flow was positively correlated with juvenile fall-run Chinook salmon survival through the Delta and that temperature was negatively correlated with survival. In testimony before the State Water Board in 1987 Kjelson presented additional analyses that again showed that survival of fall-run Chinook salmon smolts through the Delta

Attachment 3. PCFFA. Except from pp 3-4, USFWS.  
Exh 31: ' The Needs of Chinook Salmon, *Oncorhynchus tshawytscha*, in the Sacramento-San Joaquin Estuary. ' State Water Resources Control Board, 1987

Note: In his testimony to the SWRCB, below, USFWS witness Dr Martin Kjelson is referring to "The survival of marked hatchery smolts through the Sacramento Delta between Sacramento and Suisun Bay ... " as measured at Chipps Island at the eastern edge of Suisun Bay.

*There is nothing in Dr Kjelson's testimony to suggest that Delta outflow at Chipps Island should be anything less than the 20,000 to 30,000 cfs of Delta inflow, as measured at Rio Vista, that he found to be necessary to provide adequate safe passage for salmon smolts across the Delta.*

The following is taken from pages 3 and 4 of Dr Kjelson's testimony to the SWRCB :

### **Smolt Survival**

#### Sacramento River Delta

The survival of marked hatchery smolts through the Sacramento Delta between Sacramento and Suisun Bay is positively correlated to flow and negatively correlated to both temperature and the percent of the flow diverted off the Sacramento River through the Delta cross channel and Georgiana Slough at Walnut Grove.

Smolt survival increased with increasing Sacramento River flow at Rio Vista, with maximum survival observed at or above 20,000 to 30,000 cfs. This relation was based on two independent measures of survival.

Smolt survival is highest when water temperatures are below 66°F. Temperatures of 76°F or higher are lethal to salmon and stress would occur as temperatures approach that level.

Diverting smolts off the Sacramento River into the Central Delta lessens their survival. Evidence of this is 1) when about 65% of the Sacramento River was diverted to the Central Delta, tagged smolts released immediately above the Walnut Grove diversion point survived at only 50% of the rate of those released immediately below Walnut Grove, 2) when the cross channel was closed, the difference in survival for the two groups was zero at high flows, and about 25% at low flows, and 3) survival of tagged smolts released in the Central Delta was about 50% less than those released in the Sacramento River below Walnut Grove during years of low flow and similar temperatures. Hence, closing the Cross channel is of considerable benefit to salmon survival at low flows when temperatures are acceptable.

### **Applying the recommended Sacramento fall-run chinook salmon water quality and flow criteria to the Sacramento River and Delta**

Where Dr Kjelson fixed his proposed Sacramento fall-run chinook salmon out-migrant flow recommendation at Rio Vista, we would recommend moving it – the 20,000-to-30,000 criterion – further upstream to take into consideration the combined effects of Georgiana Slough and possible Delta cross channel diversions of Sacramento River water, as well as the proposed hydra-headed ‘conveyance’ reportedly favored by the current Administration – up to, say, Freeport.

Our recommendation is to split the difference between Dr Kjelson’s 20,000-30,000 cfs, the levels at which optimum levels of juvenile Sacramento River fall-run chinook survival across the Delta occur, and set a public trust resource protection flow criterion of a minimum of 25,000 cfs of Sacramento River flow past all points of diversion, present or future, from an upstream point at Freeport to a downstream point at Clapps Island from 1 April to 30 June of each year. These Sacramento River fall-run chinook salmon public trust resource protection flows should be managed adaptively so as to maintain water temperatures well below 66°F.

### **Adaptively managing the recommended Sacramento River fall-run chinook salmon public trust resource protection water quality and flow criteria**

The Interagency Ecological Program should replicate Dr Kjelson’s Sacramento River fall-run juvenile salmon smolt survival studies of the 1970s-80s. The new study should use sonic tags on the study fish to strengthen the level of its scientific certainty.

The basic objective of any adaptive management of the flow criterion should, however, be the attainment of the Pacific Fishery Management Council’s well-established conservation goal for Sacramento River fall-run chinook salmon – a spawning escapement of 122,000-180,000 adult salmon.

#### REFERENCES

CA State Water Resources Control Board. 1988. Draft Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary.  
[http://www.fishcalendar.net/cac/SWRCBs\\_1988\\_draft\\_Bay-Delta\\_water\\_quality\\_plan.pdf](http://www.fishcalendar.net/cac/SWRCBs_1988_draft_Bay-Delta_water_quality_plan.pdf)

U.S. Fish and Wildlife Service. 1987. Exhibit 31: The needs of chinook salmon, *Oncorhynchus tshawytscha* in the Sacramento-San Joaquin Estuary. Presented to the State Water Resources Control Board for the 1987 Water Quality/Water Rights Proceedings on the San Francisco Bay/Sacramento-San Joaquin Delta.

US Fish and Wildlife Service. 1992. Measures to improve the protection of chinook salmon in the Sacramento-San Joaquin River Delta. Presented to the State Water Resources Control Board for the 1992 Water Quality/Water Rights Proceedings on the San Francisco Bay/Sacramento-San Joaquin Delta.