

California Sportfishing Protection Alliance

Informational Proceeding to Develop Delta Flow Criteria for the Delta Ecosystem Necessary to Protect Public Trust Resources

Before the State Water Resources Control Board

Testimony of Bill Jennings

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The California Legislature tasked the State Water Board to develop flow criteria for the Delta ecosystem necessary to protect public trust resources, including the volume, quality, and timing of water needed under different conditions. In determining flow criteria, the State Water Board is required to review existing water quality criteria and use the best available scientific information.

The State Water Board has attempted to establish flow requirements necessary to protect public trust resources in Bay-Delta estuary numerous times over the last five decades. Without exception, these efforts have failed to reverse the relentless decline of the estuary's pelagic and salmonid fisheries. However, the voluminous scientific testimony, evidence and recommendations submitted by resource agencies, the scientific community and fishing and environmental organizations during those extended evidentiary hearings share a consistent thread – the need for substantially increased inflow to the Delta, outflow to the Bay and a significant reduction in exports. The record from the proceedings in 1987/8 and 1992, taken together, provide a robust basis for determinations of Delta inflow and outflow.

While some of our understanding and analysis have been refined since these earlier hearings, the improvements only confirm the principles and science behind the conclusions that were drawn in the earlier hearings. The basic requirements for a healthy and sustainable estuary were known then and are known now.

CSPA understands that the historic administrative record of the evidentiary hearings that culminated in the 1988 Draft Water Quality Control Plan and the 1992/3 Draft Water Right Decision 1630 have been inadvertently lost by the State Water Board. Consequently, CSPA has reassembled and is resubmitting the testimony and exhibits originally submitted by the California Department of Fish and Game (DFG) and partial exhibits of other fishery agencies and nongovernmental parties to those hearings. This record is submitted in electronic form only per Phil Crader.

The spectacular collapse of the Delta estuary since the export projects became operative is amply documented. By 1991, adult fall-run Sacramento River salmon escapement had been halved since the late 1960s, spring-run Sacramento river salmon abundance was about 0.5% of historic runs, San Joaquin River fall-run salmon escapement dropped from 70,000 in 1985 to 430 in 1991, the 1985 level of Delta smelt abundance was 80% lower than the 1967-1982 average population, adult striped bass declined from about 3 million in the early 1960s to 1.7 million in

the late 1960s to an estimate of 590,000 in 1990, abundances of shrimp and rotifers declined between 67% and 90% in the 1970s and 1980s, white catfish populations have severely declined since the mid-1970s and overall fish abundance in Suisun Marsh has been reduced by 90% since 1980. Draft Water Right Decision 1630, 1992, p 29.

Fisheries collapse over the last decade has accelerated. The Department of Fish and Game's (DFG) Fall Midwater Trawl indices for 2009 reveal that young striped bass, Delta smelt, splittail and threadfin shad are at record historical lows and that longfin smelt and American shad are at the second and third lowest level of record, respectively. DFG, Fall Midwater Trawl, exhibit CSPA-3. Sacramento River fall-run Chinook salmon, numbering some 750,000 in 2002, dropped to 90,000 in 2007 to 66,264 in 2008 and to a dismal new low of 39,530 in 2009.

In 1978, following a long formal evidentiary hearing and in a moment of remarkable candor, the State Water Board found that "full mitigation of project impacts on all fishery species now would require the virtual shutting down of the project export pumps." D-1485, p 13.

In 1988, following another extensive evidentiary hearing, the State Water Board acknowledged, "a safe level of exports is not known." Draft 1988 Water Quality Control Plan for Salinity, 7.3.2.5, p. 7-32. Indeed, the Board's 1988 draft order found that "optimal water quality objectives" for shad and striped bass larvae and salmon smolt survival in the Delta would require the prohibition of all exports between 1 April through 30 November, in all water years. Ibid, Table 5-4-1, p. 5-110. The draft order proposed significant increases in Sacramento River and Delta outflow, constraints on export pumping and other measures like additional closures of the Cross Channel gates. Despite the expenditure of enormous resources during those hearings, Governor George Deukmejian, at the behest of SWP and CVP contractors, directed the State Water Board to withdraw the draft order

Yet another long evidentiary process led to the State Water Board issuing Draft Water Right Decision 1630 in 1992. The Board observed that "net reverse flows caused by export pumping are adverse to fishery resources because they pull water and young fish of various species from the western Delta into the central Delta." Draft Water Right Decision 1630, 1992, p. 31. It declared that "reverse flows should not occur in the San Joaquin and Sacramento Rivers during the delta smelt spawning period in order to transport the larvae to appropriate habitat and to keep them there." Ibid, p. 41-42. Draft D-1630 included a requirement that "there should be no reverse flow for all water year types on a 14-day running average in the western Delta...between February 1 and June 30," that the "14-day running average flow shall be greater than -1,000 cfs in the western Delta...between July 1 and July 31" and that the "14-day running average flow shall be greater than -2,000 cfs...between August 1 and January 31. Ibid, page 46-47. And yet again, despite the expenditure of enormous effort and resources, then Governor Pete Wilson, at the behest of SWP and CVP contractors, directed the State Water Board to withdraw the draft order.

The State Water Board then proceeded down a path that provided for increased water exports chaperoned by dwindling fisheries. The catastrophic collapse of the Delta pelagic and salmonid fisheries stand as a scathing indictment of the inadequacies of Water Rights Decision 1641 adopted in 2000, which protected export agencies more than the Delta's beleaguered fisheries.

Since its adoption, the State Board has been unable or unwilling to meaningfully enforce 1641's woefully inadequate standards. Last year, virtually all of D-1641's standards were violated with no one held accountable.

Further, the SWP and CVP have been allowed to avoid mitigation for the flagrant impacts caused by project operation. The CalFed ROD's mitigation requirement of state-of-the-art fish screens was abandoned and promised habitat enhancement ignored. SWP/CVP pumps have become an environmental Dachau. The 110 million fish salvaged over a fifteen-year period (many of which do not survive return) are dwarfed by the prescreen losses estimated at; 63-99% for juvenile Chinook salmon, 70-94% for juvenile striped bass, 78-82% for steelhead and 94-99.9% for delta smelt. CSPA-4. And these identified losses exclude the prodigious numbers of larval smelt and striped bass that pass uncounted through the 20-millimeter louvers of the 1950's technology fish screens.

Water quality problems have become endemic throughout the estuary and its tributaries. Temperature and water quality standards are routinely exceeded. Diversions and channel modifications have increased water residence time leading to dissolved oxygen impacts and increased biomagnification and bioaccumulation of toxic pollutants. Increased pollutant loading gives rise to increased additive and synergistic effects of contaminants. Multiple stressors weaken fish and other aquatic life generating adverse impacts at constituent levels not normally harmful. Increased flow, especially flow from sources of relatively good quality water, while not a substitute for effective pollutant source control of, is an essential remedy for increased pollutant loading into the estuary.

- 1. State Board Question:** *What key information, in particular scientific information or portions of scientific information, should the State Water Board rely upon when determining the volume, quantity, and timing of water needed for the Delta ecosystem pursuant to the board's public trust obligations? For large reports or documents, what pages or chapters should be considered? What does this scientific information indicate regarding the minimum and maximum volume, quality, and timing of flows needed under the existing physical conditions, various hydrologic conditions, and biological conditions? With respect to biological conditions, what does the scientific information indicate regarding appropriateness of flow to control non-native species? What is the level of scientific certainty regarding the foregoing information?*

CSPA is submitting specific testimony by Dr. Carl Mesick regarding the volume, quality and timing of outflows necessary to meet temperature requirements and protect fall-run Chinook salmon in the San Joaquin basin. Beyond flows, Dr. Mesick addresses the critical need to route outmigrating fish via Old River and the need for positive flow in Old River to ensure that San Joaquin fish successfully reach Chipps Island. CSPA-7.

CSPA is submitting specific testimony by Dr. G. Fred Lee regarding pollutant impairments in the estuary, export impacts on water quality and the need to maintain positive Delta outflow to dilute pollutants and reduce residence time. CSPA-22.

CSPA is submitting specific testimony by retired DFG biologists Don Stevens, Lee Miller and Chuck Knutson regarding the continuing efficacy of DFG's recommendations during the 1992 water rights hearings on measures needed to protect pelagic and anadromous fisheries in the estuary. CSPA-25.

CSPA has reviewed much of the record of the 1987 and 1992 State Water Board evidentiary proceedings and has excerpted scientific information submitted by resource agencies and other parties it believes is pertinent to the Board's present consideration of Bay-Delta flows. This information is presented in CSPA-4.

CSPA collaborated with the California Water Impact Network (C-WIN) in developing joint flow recommendations, which are described below and in CSPA-6.

CSPA endorses and incorporates by reference the testimony and exhibits submitted by C-WIN Senior Research Associate Tim Strohane into this submittal.

2. **State Board Question:** *What can the State Water Board reasonably be expected to accomplish with respect to flow criteria within the nine months following enactment of SB 1? What issues should the State Water Board focus on in order to develop meaningful criteria during this short period of time?*

Given the consistency of testimony and recommendations from DFG, USFWS, NMFS, USGS, USEPA, the scientific community and fishing and environmental NGOs over the last twenty-five years, as well as the analysis contained in the draft orders for the 1988 Water Quality Control Plan and 1992 Water Rights proceeding; the State Water Board should be able to develop defensible criteria by the deadline established by the legislature. The Board is tasked to recommend criteria that will protect the estuary; not balance estuary needs with consumptive needs. Balancing, comes later in a formal adjudicatory proceeding. The Board is not asked to reinvent the wheel but, rather, to steer it.

3. **State Board Question:** *How should the State Water Board address scientific uncertainty when developing Delta outflow criteria? Specifically, what kind of adaptive management, monitoring, and special studies programs should the State Water Board consider as part of the Delta outflow criteria, if any?*

The perfect is the enemy of the good. We will never perfectly understand the intricacies of California's estuarine and riverine ecosystems. However, the recommendations of DFG, USFWS, NMFS and the scientific community have been remarkably consistent over more than a quarter of a century: more inflow, more outflow, elimination of reverse flow and lower exports. The consequences to the Bay-Delta estuary of failing to embrace those recommendations are appallingly clear.

Significantly greater resources are crucial for a more complete understanding of the dynamic processes that comprise this estuary. For example, CSPA has long urged

creation of a comprehensive water quality monitoring program similar to or more comprehensive than the program conducted by San Francisco Estuary Institute in San Francisco Bay. There is an array of special studies that deserve funding. Greater knowledge may provide for more precise flow management. But our present level of understanding cannot be employed as an excuse for not taking action in a time of crisis.

Adaptive management is a marvelous but elusive concept. Unfortunately, the implementation of adaptive management programs in the Bay-Delta has generally been to put “management” on the throne and “adaptive” on the scaffold. Adaptive management only works where technical staff has the power to make operational decisions.

In the absence of the results from a more comprehensive monitoring program, future studies or an effective adaptive management program, CSPA believes the State Water Board has little recourse but to rely upon the consistent expert recommendations from the wildlife agencies and scientific community regarding the needs of the Bay-Delta ecosystem.

4. **State Board Question:** *When determining Delta outflows necessary to protect public trust resources, how important is the source of those flows? How should the State Water Board address this issue when developing Delta outflow criteria?*

The life within an estuary is umbilically connected to and dependent upon the tributary streams that supply water, habitat and nutrients: they are mutually interdependent. You can't solve problems in one without addressing causation in the other. While this proceeding may focus primarily on flows necessary to restore the Delta, it must also consider the sources, quantity and quality of inflow and upstream habitat values. It must pay special attention to the natural hydrograph under which the estuary's ecosystem evolved and prospered over millennia. At the very least, this proceeding must recommend a flow regime protective of the various life stages of the aquatic inhabitants of the system. The actual apportioning of flows is for a later adjudicative process but, if possible, several alternatives should be circulated, analyzed and discussed during this proceeding. At this time, CSPA believes each river should contribute a “fair share” proportional contribution to Delta outflow.

Any “fair share” contribution must take into account special circumstances that affect the volume, timing or quality of water. For example, the San Joaquin River may be assigned additional flow contribution to mitigate for increased residence time (creation of the Deep Water Ship Channel) and/or increased pollutant loading by upstream dischargers into the river. Outflow must be sufficient to protect the historical habitat values of the Bay.

5. **State Board Question:** *What methodology should the State Water Board use to develop flow criteria for the Delta? What does that methodology indicate the needed*

minimum and maximum volume, quality, and timing of flows are for different hydrologic conditions under the current physical conditions of the Delta?

Any methodology employed by the State Water Board to develop protective flow criteria must be predicated on the essential needs of the various life stages of all species in the estuary. The Board has received vast quantities of information over the last twenty-five years and will undoubtedly be receiving substantial new information.

One approach might be to assemble all of the information by species, life stage and geographical location and then to further organize the information into needed flow criteria (base and pulse), water quality and temperature criteria, habitat criteria (for example, X2 and entrapment zone) and source criteria (factors to consider in allocating inflow that is supportive of outflow requirements). CSPA believes this will demonstrate that the information submitted by fish and wildlife agencies, the scientific community and the environmental/fishing community over the course of a quarter of a century is remarkably consistent. Approaches and techniques may evolve but the biological requirements necessary to protect aquatic species do not.

The Board should also examine the 1988 draft Water Quality Control Plan decision and the 1992 draft Water Rights decision for insight as to how staff analyzed the competing submittals to arrive at recommendations that – after balancing competing needs - are considerable more protective than the inadequate requirements in D1641. We reiterate that “balancing” should not be a factor or issue in the present proceeding. The legislature directed the State Water Board to determine what flows would be protective of the estuarine ecosystem of the Bay-Delta: not to determine whether those flows are compatible with competing needs.

6. **CSPA Recommendations**

Based upon CSPA’s review of the historical hearing records, twenty-five years of participating in water rights and Bay-Delta proceedings, survey of current science and the recommendations of Dr. Carl Mesick, Dr. G. Fred Lee and DFG biologists Don Stevens, Dave Kohlhorst and Lee Miller, CSPA believes the following requirements are necessary to protect the public trust values of the Bay-Delta estuary.

- CSPA recommends mean daily temperature requirements in tributaries of no higher than 59 degrees Fahrenheit between 1 December and 15 May.
- Pulse flow on the Sacramento River between Freeport and Chipps Island of 30,000 cfs from 1 February through 30 October.
- Minimum running 14-day average flow in the Sacramento River between Freeport and Chipps Island of 6,000 cfs.
- Escapement pulse flows on the Stanislaus, Tuolumne and Merced rivers, between 20 October through 29 October, of 1,200 cfs.

- Flow releases on the Stanislaus, Tuolumne and Merced according to the following table.

	Critical and Dry	Below Normal	Above Normal	Wet Water Year
Oct 20-29	1,200 cfs	1,200 cfs	1,200 cfs	1,200 cfs
Beginning Feb 15 to Mar 15	3,000 cfs, 2 days	3,000 cfs, 19 days 6,000 cfs, 2 days	3,000 cfs, 13 days 6,000 cfs, 5 days	3,000 cfs, 17 days 6,000 cfs, 5 days
March 15-31	1,000 cfs	1,000 cfs	1,000 cfs	3,000 cfs
April 1-15	1,500 cfs	1,500 cfs	1,500 cfs	3,000 cfs
April 16-20	2,000 cfs	2,000 cfs	2,000 cfs	3,000 cfs
April 21-30	275 cfs	2,000 cfs	2,000 cfs	3,000 cfs
May 1-15	275 cfs	2,500 cfs	2,500 cfs	3,000 cfs
May 16 – June 15	275 cfs	275 cfs	275 cfs	≥ 3,000 cfs ¹ ≥ 4,000 cfs ²

- Flows on Old River between the Head of Old River to Downstream confluence with San Joaquin River: minimum of 2,000 cfs from 15 March through 15 May.
- Positive 14-day mean flows in the San Joaquin River at Jersey Point, between 1 February and 30 June, to protect Delta smelt of: 1,000 cfs in critical years, 1,500 cfs in dry years, 2,000 cfs in below normal years, 2,500 cfs in above normal years and 3,000 cfs in wet years.
- Positive 14-day mean flows in the San Joaquin River at Jersey Point, between 1 October and 30 June, to provide positive flow for salmonid smolt outmigration of: 1,000 cfs in critical years, 1,500 cfs in dry years, 2,000 cfs in below normal and above normal years and 3,000 cfs in wet years.
- Equitable apportionment of contributions allocated among tributary streams to determine inflows to the Delta sufficient to meet Delta outflow needs in all years.
- Net Delta outflow, as a 14-day running average, between 1 February and 31 March of: 9,100 cfs in critical years, 23,500 cfs in dry years, 41,000 cfs in below normal years, 90,800 in above normal years and 91,800 in wet years.
- Net Delta outflow, as a 14-day running average, between 1 April and 31 July of: 6,700 cfs in critical years, 10,800 cfs in dry years, 14,400 cfs in below normal years, 23,000 in above normal years and 43,000 in wet years.
- Net Delta outflow, as a 14-day running average, between 1 August and 31 January of: 4,100 cfs in critical years, 9,200 cfs in dry years, 12,100 cfs in below normal years, 14,600 in above normal years and 29,000 in wet years.

- Optimal range of X2 (winter and early spring) between 1 February and 31 March, as a 14-day running average position of 2 parts per thousand salinity measured 1 meter from channel bottom, expressed in kilometers upstream from the Golden Gate Bridge is: 77 to 79 in critical years, 68 to 69 in dry years, 58 to 64 in below normal years, 52 in above normal years and 51 to 52 in wet years.
- Optimal range of X2 (spring to mid-summer) between 1 April and 31 July, as a 14-day running average position of 2 parts per thousand salinity measured 1 meter from channel bottom, expressed in kilometers upstream from the Golden Gate Bridge is: 80 to 83 in critical years, 75 to 78 in dry years, 70 to 77 in below normal years, 63 to 75 in above normal years and 54 to 73 in wet years.
- Optimal range of X2 (late summer through early winter) between 1 August and 31 January, as a 14-day running average position of 2 parts per thousand salinity measured 1 meter from channel bottom, expressed in kilometers upstream from the Golden Gate Bridge is: 83 to 90 in critical years, 70 to 87 in dry years, 67 to 84 in below normal years, 64 to 87 in above normal years and 50 to 84 in wet years.
- Overbite clam (*Corbula amurensis*) suppression outflows in excess of 115,000 cfs between February and April in 2 to 4 years out of every 10 to optimize habitat for Delta smelt, longfin smelt and other estuarine fish species. Conversely, episodic reduced outflows should be considered to suppress the more freshwater invasive Asian clam (*Corbicula fluminea*).
- Delta Cross Channel should be closed in all water years between 1 February and 30 June.
- An acoustic barrier should be installed at the head of Georgiana Slough at the Sacramento River and operated between 1 February and 30 June.
- Export pumps (Harvey O. Banks Pumping Plant and Jones Pumping Plant) should be shut down between 16 March and 30 June to facilitate San Joaquin River salmonid migration down Old River.