

State Water Resources Control Board  
Informational Proceeding to Develop Flow Criteria for the Delta Ecosystem Necessary to Protect  
Public Trust Resources

**Coalition for a Sustainable Delta's Closing Comments**

April 14, 2010

**Introduction**

The Coalition for a Sustainable Delta (Coalition) appreciates the opportunity to submit closing comments in the above-titled informational proceeding. The Coalition respectfully requests that the State Board consider and observe the following three requirements of SB-1 (i.e., the Sacramento-San Joaquin Delta Reform Act of 2009) in formulating the informational flow criteria:

1. SB-1 Requires the State Board to Formulate Informational Flow Criteria that Protect Public Trust Resources to the Extent Feasible.
2. SB-1 Requires the State Board to Formulate Informational Flow Criteria that Protect All Public Trust Resources, Not Only Certain Native or “Desirable” Fishes.
3. SB-1 Requires the State Board to Base Flow Criteria on the Best Available Scientific Information Rather than Speculation or Surmise.

**Closing Comments**

**1. SB-1 Requires the State Board to Formulate Informational Flow Criteria that Protect Public Trust Resources to the Extent Feasible**

In its December 16, 2009 Notice of Public Informational Proceeding (Notice), the State Water Resources Control Board (State Board) specifically stated that the purpose of the noticed hearing is “to receive scientific information in order to develop new flow criteria for the Sacramento-San Joaquin Delta (Delta) ecosystem necessary to protect public trust resources . . . .” Notice, Attachment A at 1.

As the Coalition already explained in its *Clarifying Questions in Response to Policy Arguments and Assumptions in Written Testimony* (March 9, 2010) (already in the record for this Informational Proceeding), under controlling California constitutional, statutory, and decisional authority, the State Board’s public trust obligations are necessarily limited by the competing public interest in diversions for municipal, commercial, and agricultural uses.

Unfortunately, some of the participants continue to assume and assert that the State Board’s mandate under SB-1 requires the State Board to pretend as if there were no water rights, no diversions for agricultural, municipal, or commercial use, no flood control requirements, no flows required for power generation, and to formulate purely informational flow criteria based on

what would be best for public trust resources if we lived in a radically different world governed by a radically different legal regime.<sup>1</sup>

In addition, during the public hearings, several participants reiterated the assumption in their written testimony that the State Board should formulate informational flow criteria sufficient to ensure the “full recovery” of threatened or endangered species, i.e., self-sustaining populations of sufficient abundance to warrant de-listing them under the federal Endangered Species Act.<sup>2</sup> Furthermore, many participants urged the State Board to adopt a strong version of the precautionary principle, and formulate flow criteria in the face of scientific uncertainty based on the most conservative assumptions about what the native or “desirable” fishes require.<sup>3</sup>

These unfounded assumptions were often voiced at the hearings, but panelists were never challenged to support their assumptions with any legal authority or reasoned argument. Thus, the Coalition urges the State Board to revisit the Coalition’s prior written testimony, which sets forth the legal basis for informational flow criteria that protect public trust resources to the extent feasible given the legitimate, competing uses of Delta resources.

In the alternative, if the State Board formulates informational flow criteria based on any counterfactual assumptions, the Coalition respectfully requests that the State Board expressly set forth each assumption to aid the bodies responsible for developing the Bay Delta Conservation Plan and the Delta Plan in their consideration of the State Board’s informational flow criteria.

## **2. SB-1 Requires the State Board to Formulate Informational Flow Criteria that Protect All Public Trust Resources, Not Only Certain Native or “Desirable” Fishes.**

It became clear during the hearings that many of the witnesses share the unfounded assumption that “public trust resources” means “native fishes,” “desirable fishes” (a slightly broader category which includes native fishes and striped bass), or, amorphously, the Delta ecology. In addition, the discussion during the hearings focused only on a subset of native fishes, namely salmon, steelhead, delta smelt, longfin smelt, splittail smelt, and white and green sturgeon (although sturgeon received only passing mention in the three full days of testimony).

As explained below, public trust uses include commerce, navigation, fishing, recreation, scientific study, bird and wildlife preservation, and aesthetic appreciation. Thus, while it is perfectly understandable that the discussion would focus on species of most concern, the State Board must now formulate informational flow criteria that protect all public trust resources,

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<sup>1</sup> See, e.g., Oral Testimony of Christina Swanson (The Bay Institute), State Board Flow Criteria Hearings, Hydrodynamics Panel (March 24, 2010) (reiterating TBI’s position that SB-1 requires the Board to formulate flow criteria to restore public trust resources, and that once those flows have been formulated, the Board will know how much water is left for other uses).

<sup>2</sup> See, e.g., Oral Testimony of Craig Anderson (U.S. Fish and Wildlife Service) and Rosalie del Rosario (NOAA Fisheries), State Board Flow Criteria Hearings, Hydrology Panel (March 22, 2010); testimony of Jonathan Rosenfield (The Bay Institute), State Board Flow Criteria Hearings, Pelagic Fishes Panel (March 23, 2010).

<sup>3</sup> See footnote 1, *supra*.

which include recreational and commercial uses in addition to the needs of a certain select group of fishes.

Under the public trust doctrine, certain resources are held in trust by the state for the benefit of its citizens. The state is both the trustee and administrator of the trust, and the citizens are the beneficiaries of the trust. The states hold title to all navigable waters, tidal lands (i.e., lands periodically submerged and exposed by tides), and submerged lands beneath the navigable waters within their respective jurisdictions in trust for the benefit of their citizens. *Shively v. Bowlby*, 152 U.S. 1, 49-50 (1894); *Nat'l Audubon Society v. Superior Court*, 33 Cal.3d 419, 425 (1983) (“[T]he core of the public trust doctrine is the state’s authority as sovereign to exercise a continuous supervision and control over the navigable waters of the state and the lands underlying those waters”).

The courts have expanded the range of public trust uses from commerce and navigation, to include recreational uses such as hunting and swimming, as well as their use for scientific study. *City of Berkeley v. Superior Court*, 26 Cal.3d 515, 521 (1980) (citing *Marks v. Whitney*, 6 Cal.3d 251, 259-60 (1971)). Furthermore, the courts’ understanding of “public trust uses” has been expanded to include the preservation of the tidelands as “environments which provide food and habitat for birds and marine life.” *Marks v. Whitney*, 6 Cal.3d at 259-60 (internal citations omitted). Further expanding on this principle, the court of appeal has also recently held that all undomesticated birds and wildlife anywhere in the state are public trust resources. *Center for Biological Diversity v. FPL Group, Inc.*, 166 Cal.App.4th 1349, 1362-63 (2008); *see also People v. Truckee Lumber Co.*, 116 Cal. 397, 400-01 (1897) (the state has authority to preserve fish in nonnavigable waters for the benefit of the people)).

These competing public trust uses are recognized in the California Water Code as beneficial uses. Water Code § 1243 (recreation, as well as the preservation and enhancement of fish and wildlife resources are beneficial uses). However, the code also declares it “to be the established policy of this state that the use of water for domestic purposes is the highest use of water.” Water Code § 1254. Similarly, as the court noted in *Center for Biological Diversity v. FPL Group, Inc.*, a trustee resource agency may have to balance the conflicting demands for energy and for protection of environmental values. *Center for Biological Diversity v. FPL Group, Inc.*, 166 Cal.App.4th at 1369 (citing Stevens, *The Public Trust: A Sovereign’s Ancient Prerogative Becomes the People’s Environmental Right*, 14 U.C. Davis L.Rev. 195, 224 (1980)).

Among other things, SB-1 added section 85086(c)(1) to the Water Code, which provides in relevant part:

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.

(Emphasis added.)

In light of the broad scope of the public trust doctrine as it has been articulated by the courts, and the State Board's mandate to formulate informational flow criteria "pursuant to its public trust obligations," the State Board is not at liberty to formulate flow criteria to protect a narrow band of fishes in the Delta. It must formulate flow criteria to protect all public trust resources, which includes commercial uses (e.g., power generation), navigation, and recreation, as well as the broad array of native species that inhabit or use the Delta.

### **3. SB-1 Requires the State Board to Base Flow Criteria on the Best Available Scientific Information Rather than Speculation or Surmise.**

The State Board has indicated that "[c]losing comments from participants should summarize what flow criteria, including the volume, quality, and timing of water, are necessary to protect public trust resources in the Delta under current conditions." *See* [http://www.swrcb.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/dvd\\_webcast.shtml](http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/dvd_webcast.shtml). This Board has already received numerous recommendations regarding flow criteria, and we anticipate that the Board will receive additional recommendations in response to the solicitation of closing comments. It will be necessary for the State Board to utilize an objective standard to assess these proposed flow criteria and select among them or devise its own alternative criteria.

The legislative provision of SB-1 that mandates development of new flow criteria for the Delta ecosystem states that "[i]n carrying out this section, the board shall . . . use the *best available scientific information*." Cal. Water Code § 85086(c)(1) (emphasis added). It further states that the purpose of the flow criteria is to inform "planning decisions for the Delta Plan and the Bay Delta Conservation Plan." *Id.* § 85086(c)(1). Like the flow criteria, the Delta Plan must "be based on the best available scientific information." *Id.* § 85308(a).

Further evidence of the legislature's intent to ensure that decisions respecting the Delta are made on the basis of the best available scientific information can be gleaned from other provisions of the Sacramento-San Joaquin Delta Reform Act. For example, SB 1 establishes the Delta Independent Science Board and Delta Science Program. *See id.* § 85280. "The mission of the Delta Science Program," according to SB 1, "shall be to provide the *best possible unbiased scientific information* to inform water and environmental decisionmaking in the Delta." *Id.* § 85280(b)(4) (emphasis added).

In light of the foregoing, the State Board is obliged to evaluate proposed flow criteria in light of knowledge derived from science. As the Board is undoubtedly aware, "[s]cience is a process of learning about nature in which competing ideas about how the world works are measured against observations." Ray Hilborn & Marc Mangel, The Ecological Detective 12 (1997).

The scientific method provides a more reliable explanation of the relationship between variables than alternative approaches, such as reliance on intuition or folklore. John R. Platt, *Strong Inference*, 146 Science 347 (1964). The scientific method involves (a) identification of variables to be studied, (b) development of a hypothesis that proposes a relationship between those variables and is falsifiable, (c) selection of data to represent those variables, (d) analysis of the data, (e) evaluation of the results of the analysis, and (f) suggestions regarding the significance of the results, including whether the results falsify the hypothesis. Hypothesis testing in the

ecological sciences is *de rigueur*, recognized as the predominant method of identifying environmental cause and effect relationships and accurately characterizing relationships between individual species and the attributes of the ecosystems that support them. A.J. Underwood, *Observations in Ecology: You Can't Make Progress on Processes without Understanding the Patterns*, 250 Journal of Experimental Marine Biology and Ecology 97 (2000). A more recent, alternative form of scientific inquiry is based on consideration of multiple hypotheses tested against one another in an effort to ascertain the degree of belief that should be accorded to each. Ray Hilborn & Marc Mangel, The Ecological Detective 12 (1997). This is the Bayesian approach and is distinguishable from classical hypothesis testing. Both forms of inquiry are scientific in that they are transparent and can be replicated.

Unfortunately, numerous stakeholders have presented the State Board with proposed flow criteria that are not based on the best scientific information. All too often, the proposed criteria have not been subject to either classical hypothesis testing or the Bayesian approach to determine whether the hypothesized relationship between variables (here the relationship between inflow or outflow at a specified volume, time, rate of change and geographic location, on the one hand, and a proposed response in one or more biological variables, such as delta smelt abundance, on the other). Reliance on judgment -- even the best professional judgment of well-regarded experts -- is no substitute for scientific information. Even where proposed criteria are grounded in existing, empirical research, where substantial flaws have been identified in the data or methods used, it is not appropriate to adopt such criteria absent additional scientific inquiry.

One example of a proposed flow criterion that is not based on the best scientific information is the fall outflow criterion proposed by The Bay Institute and Natural Resources Defense Council. Those entities have proposed a criterion that is similar to Reasonable and Prudent Alternative (RPA) component 3 from the U.S. Fish and Wildlife Service Biological Opinion for the Proposed Coordinated Operations of the Central Valley Project and State Water Project. Summary of Testimony, The Bay Institute and Natural Resources Defense Council at 2 (“Based on the need to reclaim core habitat for delta smelt and other species, increase fall outflow to ensure that X2 is positioned between 83 km (in the driest years) and 71 km (in the wettest years).”). The purpose of RPA component 3 “is to improve fall habitat for delta smelt through increasing Delta outflow during fall.” U.S. Fish and Wildlife Service, Biological Opinion for the Proposed Coordinated Operations of the Central Valley Project and State Water Project 282 (Dec. 15, 2008).

The proposed flow criterion is based on the assumption that X2 (which is the zone in the Delta where salinity is 2 parts per thousand) is an appropriate surrogate for delta smelt habitat. We are not aware that this assumption has been subjected to hypothesis testing or falsification. In fact, one of the two key documents relied upon to support RPA component 3 concludes that specific conductance (an appropriate proxy for X2) explains less than 19 percent of the deviance in delta smelt occurrence (which the authors use as a proxy for habitat). Fred Feyrer et al., *Multidecadal Trends for Three Declining Fish Species: Habitat Trends and Mechanisms in the San Francisco Estuary, California, USA*, 64 Canadian Journal of Fisheries and Aquatic Science 723 (2007).

The criterion is based on the further assumption that moving X2 westward toward the Pacific Ocean will result in a net increase in the quantity and quality of delta smelt habitat. Cf. U.S. Fish

and Wildlife Service, Biological Opinion for the Proposed Coordinated Operations of the Central Valley Project and State Water Project 282 (Dec. 15, 2008). But a peer review of the RPAs commissioned by the Fish and Wildlife Service concluded that this assumption is not well supported and the arguments in support of RPA component 3 are weak. Independent Peer Review of Two Sets of Proposed Actions for the Operations Criteria and Plan's Biological Opinion 18 (Nov. 19, 2008) (“The degree to which moving X2 seaward will affect delta smelt habitat is not well supported by the analyses presented, and the additional arguments presented for this action also seem weak.”).

Subsequent, independent analysis of RPA component 3 completed by a National Research Council committee likewise identified substantial flaws in the X2 hypothesis. The committee noted, *inter alia*, that “[t]he weak statistical relationship between the location of X2 and the size of smelt populations makes the justification for this action difficult to understand.” National Research Council, A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay Delta 41 (2010).

These threshold issues with the fall inflow criterion are compounded by numerous other flaws in the analysis. For example, the National Research Council committee concluded that “how specific X2 targets were chosen and their likely beneficial effects need further clarification.” *Id.* RPA component 3 requires Delta outflows in the fall necessary to maintain average X2 for September and October no greater than 74 km east of Golden Gate Bridge in wet years and 81 km east of Golden Gate Bridge in above normal years. Biological Opinion for the Proposed Coordinated Operations of the Central Valley Project and State Water Project 369 (Dec. 15, 2008). According to the Service, this will result in “habitat area” for the delta smelt of approximately 13,000 hectares (ha) in wet years and 8,000 ha in above normal years. But no scientific information is marshaled in support of the suppositions by the Service that the two-dimensional low salinity zone mapped by the Service is an accurate proxy for delta smelt habitat and that the surface area of so-called habitat established through implementation of this action is necessary or desirable to protect delta smelt. The correlation identified by the Bay Institute and Natural Resources Defense Council between the fall midwater trawl index and hectares of so-called “suitable abiotic habitat” is irrelevant as it does not demonstrate any relation between manipulation of X2 in the fall and subsequent abundance. *See* Exhibit TBI-2 at 32, available at [http://www.swrcb.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/docs/exhibits/bay\\_inst/tbi\\_exh2.pdf](http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/bay_inst/tbi_exh2.pdf).

One author of the Fish and Wildlife Service Biological Opinion and expert witness for the Service in existing litigation respecting that document acknowledged that the specific X2 targets lack scientific bases in recent testimony in federal district court. Transcript of Proceedings in the Delta Smelt Cases, E.D. Cal. Case No. 09-407 at 230-31 (April 2, 2010) (statement of Mr. Feyrer) (acknowledging that the difference between setting X2 at 74 km and 77 km is a very small change and is not likely to make a difference).

X2 is but one example of a flow criterion that has no basis in the best available scientific information available. Indeed, the existing scientific literature raises significant doubts as to the validity of this criterion. Therefore, the State Board must scrutinize any proffered informational

flow criterion in light of the best available science to determine if it should be included in the State Board's informational flow criteria. Cal. Water Code § 85086(c)(1).

The State Board must also resist any tendency to give what appear to be intuitive “common-sense” rationales any credence absent support in the best available scientific information. For example, some participants speculate that since the native species evolved in natural hydrographic conditions, then the State Board should formulate informational flow criteria to mimic the natural hydrograph or unimpeded flows as a proxy for the natural hydrograph. *See, e.g., California Water Impact Network, Exhibit 2, C-WIN Testimony: Optimal Conditions in the San Francisco Bay-Delta Estuary 7* (February 16, 2010). Intuitive as this may appear, it is not based on hypothesis testing and falsification, and it has not been demonstrated to be “necessary” to protect public trust resources in the Delta.

### **Conclusion**

To fulfill its mandate under SB-1, the State Board must formulate informational flow criteria that protect the broad array of public trust uses to the extent feasible given other legitimate beneficial uses and legal requirements. To the extent that the informational flow criteria are based on any assumptions about diversions, flood control, or other beneficial uses, the Coalition respectfully requests that the State Board expressly set forth each such assumption.

In addition, the State Board must base its informational flow criteria on the best available scientific information, and should carefully scrutinize each proffered flow criterion for support (or lack thereof) in the scientific literature. Therefore, the State Board should clearly articulate the scientific basis for each criterion it includes in the informational flow criteria, and make explicit any assumed relationships between flow and certain expected responses.