



By email and hand delivery

March 2, 2007

Tam M. Doduc, Jr., Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

RE: PELAGIC ORGANISM DECLINE

Dear Chairwoman Doduc,

This letter is submitted as the opening comments of the Bay Institute regarding the State Water Resources Control Board's (SWRCB) public workshop to consider the Pelagic Organism Decline (POD) and possible updates to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan). In summary, we make the following arguments:

- (1) Pelagic fish populations in the Delta are experiencing a precipitous decline, which constitutes a critical degradation of the estuarine habitat and fish and wildlife beneficial uses. The SWRCB is obligated to address factors within its authority that contribute to the degradation of these beneficial uses.
- (2) Research into the causes of the POD indicates that export pumping, San Joaquin River flows, and Delta outflows are important factors contributing to the decline. These factors fall within the SWRCB's authority in adopting water quality objectives and setting water rights permit conditions.

- (3) Agency reliance on the EWA and other limited environmental water assets has precluded the adoption or limited the implementation of numerous potential remedial actions. The SWRCB is not constrained by agency commitments regarding the EWA and related programs in considering actions to protect beneficial uses.
- (4) The SWRCB should protect beneficial uses by revising the Bay-Delta Plan and the CVP and SWP water rights permits to include new requirements for export criteria, San Joaquin River flows, and Delta outflows.

1. Pelagic fish populations in the Delta are experiencing a precipitous decline, which constitutes a critical degradation of the estuarine habitat and fish and wildlife beneficial uses.

The POD refers to the precipitous decline of four estuarine pelagic fish species: delta smelt, longfin smelt, striped bass and threadfin shad. This multi-species decline was detected in 2002 but first reported in 2005. Despite moderate to wet hydrological conditions since 2002, most of these species have shown no meaningful improvement in population abundance. For delta smelt, which is already listed as threatened under state and federal Endangered Species Acts, 2004, 2005 and 2006 were, respectively, the third, first and second lowest abundances measured for the species during the entire 40-year history of the Fall Midwater Trawl (FMWT) Survey. Based on these population levels, as well as recent population viability analyses, the delta smelt is clearly at imminent risk of extinction (see Attachment 1, a petition from TBI and other parties to the California Fish and Game Commission to list delta smelt as endangered, for additional information). For juvenile striped bass, the five-year period of 2002-2006 includes all of the five lowest abundances ever measured for this species by the FMWT. Longfin smelt exhibited modest improvement in 2006 following near record low levels during the 2003-2005 period (2005, 2004 and 2003 were, respectively, the second, fourth and fifth lowest abundances on record) but the abundance of this species is still nearly an order of magnitude lower than levels measured just 20 years ago. The continuing low population levels of these estuary-dependent fishes is a clear indication that environmental conditions in the Sacramento-San Joaquin Delta Estuary are extremely poor, and that the estuarine habitat and fish and wildlife beneficial uses that the Bay-Delta Plan is intended to protect are not in fact being adequately protected but are rather being severely degraded.

2. Research into the causes of the POD indicates that export pumping, San Joaquin River flows, and Delta outflows are important factors contributing to the decline.

During the past year, agency and university scientists have made tremendous progress towards understanding the environmental and management factors that have contributed to the recent dramatic decline in estuarine pelagic fish populations as well as the longer term decline that has been evident since the 1980s. The researchers began with the hypothesis that one, or some combination, of three main drivers was responsible for the POD: water management operations; toxics; and invasive species. Their results, presented at the CALFED Science Conference (October 2006), the 2006 Environmental Water Account Review (December 2006); and the Interagency Ecological Program Conference (February-March 2007), show that all three factors, as well as the interactions among those factors, are contributing to the extremely poor ecological conditions in the estuary. A number of their findings are directly relevant to activities regulated by the SWRCB in the Bay-Delta Plan.

Exports: High export rates during the late winter and spring are directly implicated in 1) the population decline of delta smelt; 2) disproportionately high incidental take of all POD species in recent years; and 3) adverse hydrodynamic conditions in the central and south Delta (i.e., negative flows on Old and Middle Rivers). High export rates during the summer may also be contributing to reduced planktonic food supplies for POD species by exporting zooplankton produced in the central and south Delta and/or preventing its transport downstream to the confluence and Suisun Bay. The research has also shown that the adverse effects of high export rates are exacerbated by concurrent low San Joaquin River inflows (see below).

San Joaquin River (Vernalis) Flows: Low flows on the San Joaquin River during the winter, spring and summer, in combination with concurrent high exports rates, result in adverse hydrodynamic conditions in the central and south Delta, most easily quantified and expressed as negative flows on Old and Middle River. Particle tracking modeling results suggest that under these conditions virtually all small pelagic organisms (including plankton and larval and small juvenile fishes) are entrained into either the federal and state export facilities or local unscreened water diversions. Other results demonstrate that the numbers of fish taken at the water export facilities are directly proportional to the magnitude of the negative flows in these Delta channels and that under positive or zero net flow conditions incidental take of threatened fishes like delta smelt can be extremely low.

Delta Outflow: The relationship between Delta outflows during the spring and abundance of several of the POD species remains strong and, it is worth noting that spring outflows in 2002 were the lowest since the mid-1990s, producing an average spring X2 value that was comparable to conditions typical during a critically dry year. The POD research, however, focused on reduced freshwater outflows to the Delta during the fall and found that resultant elevated western Delta salinities were correlated with lower populations of juvenile delta smelt during the following summer. Since there is a positive relationship between abundance of juvenile delta smelt and adult delta smelt measured later in the year, environmental conditions that reduce abundance of juveniles contribute to the overall population decline. The mechanism for this relationship appears to be the effects of reduced fall outflows on the distribution and abundance of the invasive clam *Corbula amurensis*: high fall salinities have allowed the clam, which is known to have severe negative effects on the estuary's planktonic food web, to increase its range into the western Delta. Separate analyses of "habitat quality" also showed that reduced Delta outflows during the fall and elevated salinities were the main driver for measured declines in overall habitat quality in the upper estuary.

3. Agency reliance on the EWA and other limited environmental water assets has precluded the adoption or limited the implementation of numerous potential remedial actions.

Synthesis and integration of the POD research results suggest that protection of the estuarine habitat and fish and wildlife beneficial uses in the Delta will require new efforts to: 1) reduce direct and indirect mortality of estuarine fishes (adults, juveniles and larvae) for the effects of water management operations, with particular emphasis on the effects of water export operations; 2) improve estuarine habitat quality by increasing Delta outflows during the spring and fall; and 3) improve primary and secondary production and facilitate transport of planktonic food organisms from central and south Delta channels to the confluence and Suisun Bay.

On the bases of these findings, federal and state agency scientists have developed a number of potential habitat and fish protection actions, including limits on negative flows in Old and Middle Rivers, seasonally increased Delta outflows, and additional export restrictions. These potential actions and evaluations of their scientific rationales are described in the California Resources Agency Pelagic Organism Action Matrix Related to Water Operations documents (Attachments 2, 3 and 4) and the notes of the U.S. Fish and Wildlife Service's Dealt Smelt Working Group, particularly for the period from July 10, 2006, to February 9, 2007, which are available at:

http://www.fws.gov/sacramento/es/delta_smelt.htm. However, despite the continuing critical status of delta smelt (and other POD species), resource agency concerns over inadequate environmental water supplies to implement these actions (e.g., the Environmental Water Account [EWA]) have either precluded the adoption of specific recommendations or limited the scope (i.e., size and/or duration) of potential remedial actions. To date, the limited and unreliable environmental water supplies available to the resource agencies have been inadequate to achieve the improvements to estuarine habitat needed to protect vulnerable estuarine species and restore their populations.

The SWRCB, however, is and should not be constrained by agreements and decisions made by the resource agencies under their Endangered Species Act permitting authority. The SWRCB is obligated to protect beneficial uses under its state and federal Clean Water Act authority. The unfortunate and unavoidable fact is that use of the EWA and related programs by the resource agencies has failed to prevent degradation of beneficial uses in the Delta.

4. The SWRCB should protect beneficial uses by revising the Bay-Delta Plan and the CVP and SWP water rights permits to include new requirements for export criteria, San Joaquin River flows, and Delta outflows.

Building on the important new findings of the POD research, additional information contained in the accompanying documents and in material we will present to the SWRCB later this month, and the evidence previously submitted to the SWRCB, we recommend that the SWRCB consider the following changes to the Bay-Delta Plan:

1. Delete the “no net water supply impacts” language from Footnote 18 (and also referenced in Footnote 20) to Table 3, Water Quality Objectives for Fish and Wildlife Beneficial Uses in the Bay-Delta Plan (see Attachment 5 for an extended discussion of this recommendation). The SWRCB should also specifically condition the water rights permits of the Central Valley Project and State Water Project on adopting and implementing specific operational measures to address export, river flow and outflow conditions contributing to the decline of Delta pelagic species.
2. Establish a Bay-Delta Protection Fund (see Attachment 5).
3. Establish new flow objectives for Old and Middle Rivers that limit combined flows to no less than –4000 cfs (tidally averaged) during the late winter and spring (February-April 15) to reduce direct entrainment

- mortality and to facilitate downstream movement of larval and juvenile estuarine fishes.
4. Establish new flow objectives for Old and Middle Rivers that limit combined flows to no less than –4000 cfs (tidally averaged) during the summer (May 16-October) to facilitate downstream transport of phyto- and zooplankton produced in the central and south Delta.
 5. Revise the February – June Delta outflow objective to maintain flows and X2 location assuming a 1956 – 68 Level of Development; eliminate the Port Chicago EC trigger in February and March; and clarify the “three ways to win” methodology for measuring compliance with the February – June Delta outflow objective in order to ensure that desired X2 location is achieved and to improve estuarine habitat quality during the spring. (See BAY-EXH-04, BAY-EXH-05, BAY-EXH-10, and BAY-EXH-11).
 6. Establish new Delta outflow objectives for the fall (October – December) to maintain X2 downstream of 80 km to improve estuarine habitat quality and reduce the distribution and abundance of the clam *Corbula*.
 7. Revise the San Joaquin Flow (Vernalis) objectives to increase flows during the winter and spring (February – June), and revise accompanying export criteria during this period, to facilitate downstream transport of young estuarine fishes and planktonic food organisms and to improve estuarine habitat quality. (See BAY-EXH-06, BAY-EXH-07A, BAY-EXH-07B, BAY-EXH-08, BAY-EXH-09, BAY-EXH-10, and BAY-EXH-11).

Supplementary Documents and Information

The attached documents accompanying these comments contain information to further describe and supplement results of the POD research. They also provide additional information relevant to the SWRCB’s review of current conditions in the estuary and to support the specific recommendations we make regarding amendments to the Bay-Delta Plan and the water rights permits of the CVP and SWP.

Attachment 1: Petition to the State of California Fish and Game Commission and Supporting Information for Listing the Delta Smelt (*Hypomesus transpacificus*) as

an Endangered Species under the California Endangered Species Act (filename: DS State Endangered Petition February 7 2007 Final.pdf) and available at: <http://www.biologicaldiversity.org/swcbd/species/deltasmelt/DS-State-Endangered-Petition-02-07-2007.pdf>.

Attachment 2: California Resources Agency Pelagic Organism Action Matrix Related to Water Operations, November 22, 2006 (filename EWA CRA Action Matrix 11-22-06.pdf).

Attachment 3: California Resources Agency Pelagic Organism Action Matrix Related to Water Operations, November 22, 2006 (filename Action Matrix Background Info 11-22-06).

Attachment 4: California Resources Agency Pelagic Organism Action Matrix Related to Water Operations, November 22, 2006 (filename: Action Matrix Supplemental info 12-07-06).

Attachments 2, 3 and 4 are also available at:
http://science.calwater.ca.gov/pdf/ewa/EWA_CRA_action_matrix_112206.pdf;
http://science.calwater.ca.gov/pdf/ewa/EWA_background_info_CRA_action_matrix_112206.pdf; and
http://science.calwater.ca.gov/pdf/ewa/EWA_action_matrix_supplement_draft_120706.pdf.

Attachment 5: Letter from TBI to the SWRCB regarding draft Bay-Delta Plan amendments, November 12, 2006 (filename: WQCP-TBIcomments111206.doc 3).

Attachment 6: Letter from TBI and other groups to Federal and State Agencies recommending additional protection for delta smelt and other POD species, June 5, 2006 (filename: Delta Actions Recommendations letter 6-5-06.pdf).

Thank you for considering our comments and recommendations regarding potential amendments and revisions to the Bay-Delta Plan. Please contact us if you have any questions regarding these comments.

Sincerely,

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