

Staff Report

Central Valley Water Board Actions to Protect Beneficial Uses of the Sacramento-San Joaquin Delta

Public Meeting

5 March 2008

**Karen Larsen
Senior Environmental Scientist
Water Board Bay-Delta Team**

Background

Monitoring conducted by the Interagency Ecological Program (IEP) has shown declines in the abundance of four pelagic fish species in the upper San Francisco Estuary¹. Abundance indices for 2002-2004 demonstrate record lows for Delta smelt and young-of-year striped bass and near record lows for longfin smelt and threadfin shad. In contrast, no pelagic fish species inhabiting the lower estuary or San Francisco Bay shows a similar decline. Therefore, it appears that the pelagic organism decline (POD) is confined to the upper estuary and freshwater Delta. This raises concerns about whether beneficial uses of the Sacramento-San Joaquin Delta are protected.

In response to these concerns, staff from the State Water Board and the San Francisco Bay and Central Valley Regional Water Boards formed the Bay-Delta Team to improve coordination of the Water Boards' activities in the San Francisco Bay and Sacramento-San Joaquin Delta (Bay-Delta). In 2007, the Bay-Delta Team began developing a long-term program for addressing impacts to beneficial uses of water in the Bay-Delta. At that time, staff recognized that in addition to long-term planning, there was need to identify actions that should be implemented immediately to control known or suspected impairments (e.g., studies to assess impacts of ammonia on Delta species) and short-term actions that would contribute to development of the comprehensive program (e.g., development of a comprehensive monitoring and assessment strategy). To start the process and get input from the Water Boards and the public, the Bay-Delta Team prepared a resolution (Delta Actions Resolution²) describing the activities identified. The Water Boards adopted the resolution at their December and January meetings and, in doing so, they directed staff to develop a strategic workplan that prioritizes the actions, establishes time schedules for implementing them, and identifies existing and needed resources.

The purpose of the public meeting on 5 March is to get input from stakeholders and the public that staff can use in developing the strategic workplan for the actions in the resolution that are the Central Valley Water Board's responsibility. At the 5 March public meeting staff will focus on the actions that are not directly part of ongoing programs, such as the development and implementation of Total Maximum Daily Loads (TMDLs). Those programs already have established processes for obtaining stakeholder input, which will be incorporated into the strategic workplan.

Staff acknowledges that the water quality elements described below are just the first step in the process of establishing the comprehensive Delta program. The Bay-Delta

¹ Interagency Ecological Program 2006-2007 Work Plan to Evaluate the Decline of Pelagic Species in the Upper San Francisco Estuary. January 2007. Chuck Armor, Randall Baxter, Rich Breuer, Mike Chotkowski, Steve Culberson, Marty Gingras, Bruce Herbold, Anke Mueller-Solger, Matt Nobriga, Ted Sommer, and Kelly Souza

² Resolution no. R5-2007-0161 at http://www.waterboards.ca.gov/centralvalley/adopted_orders/Resolutions/R5-2007-0161_res.pdf

Team will be building the comprehensive program over the next year in coordination with other Bay-Delta planning efforts, such as Delta Vision, Bay Delta Conservation Plan, and the Delta Risk Management Strategy. Interested stakeholders will have opportunity to provide input along the way.

This document summarizes the actions that will be discussed at the 5 March public meeting and specifies the input we are seeking.

Summary of Actions

As noted above, many of the water quality actions identified are activities the Central Valley Water Board already is conducting or planning to conduct. These include the development of the long-term salinity management plan, TMDL development and implementation, and development of the Central Valley Drinking Water Policy. Staff will continue to work on these programs as the strategic work plan for the Delta is developed. The purpose of including these in the Delta Actions Resolution was to recognize the breadth of work already taking place in the Delta and to reinforce that these activities are high priorities. The rationale and status of the existing programs are summarized at the end of this document to provide context for prioritizing actions.

The Delta Actions Resolution also identified significant new work that will require either redirecting or obtaining new resources. As discussed above, the strategic work plan will prioritize actions including the resources needed to accomplish them. These new actions include development of a comprehensive regional monitoring program including compiling and assessing toxicity and contaminants data, characterizing discharges from Delta islands, investigating the effects of ammonia on Delta species, working with the Department of Pesticide Regulation and Delta County Agricultural Commissioners to determine the need for increased enforcement of or additional restrictions on in-Delta pesticide use, and identifying interim regulatory actions to address the potential impacts from the Contra Costa power plant diversion.

New Actions (focus of 5 March public meeting)

Comprehensive Regional Monitoring Program

Rationale: Many agencies and groups monitor water quality, water flows, and ecological conditions in the Bay-Delta, but there is no comprehensive contaminants monitoring and assessment program. IEP, CALFED, and other organizations, including the Water Boards, conduct some of these analyses, but due to their specific mandates, information gaps may exist. Emerging concerns with contaminants related to the POD, waste water treatment plant discharges, agricultural discharges, pesticides, blue-green algae toxicity, and unknown toxicity events all highlight the need to improve coordination of contaminants monitoring. A system is needed for coordinating among monitoring programs and integrating contaminants monitoring into existing monitoring efforts

whereby all data is synthesized and assessed on a regular basis. An example of such a program is the San Francisco Bay Regional Monitoring Program (RMP).³

Action: The Water Boards staff will develop a comprehensive long-term, coordinated, Delta-wide monitoring program to provide data on contaminants in sediments, water, and aquatic organisms and to compile and assess that data regularly. The San Francisco Bay RMP will be used as a model for this program. This monitoring program will be integrated into current monitoring efforts such as the San Joaquin River Basin Monitoring Partnership, the CALFED Science Program's proposal to develop a strategic plan for monitoring in the Delta, and monitoring conducted by the IEP.

Current Activities Related to Action:

- Staff met with the Central Valley Clean Water Association (CVCWA), an organization that represents wastewater dischargers, to begin discussing the feasibility of developing a regional monitoring program for the Delta and upstream watersheds. Since then, CVCWA and the Sacramento River Watershed Program have initiated a partnership to propose a pilot regional monitoring program for the Sacramento River portion of the Delta.
- The State Water Board contracted with the UC Davis to compile and assess available data on toxicity and contaminants and to make recommendations for future monitoring in the Delta. The report will be complete in fall 2008.
- The CALFED Science Program is considering a proposal to develop a strategic plan for monitoring in the Delta. Once contracts are in place, the project is scheduled to be complete in 18 months.
- US EPA funded a project to develop a directory of monitoring being conducted in the San Joaquin River watershed. The Central Valley Water Board Surface Water Ambient Monitoring Program (SWAMP) is funding expansion of the effort throughout the Central Valley, including the Delta, and will be testing the system in February 2008.
- The Central Valley Water Board's Surface Water Ambient Monitoring Program initiated a pilot study to determine the feasibility of using NPDES permit required ambient, receiving water monitoring data for regional water quality assessment.

Input Sought:

- What are the advantages and disadvantages of implementing a regional monitoring and assessment program?

³ The RMP is a required collaborative effort between the San Francisco Regional Water Board, regulated dischargers, and SFEI, which administers the program, to monitor contamination in the San Francisco Estuary. The San Francisco Regional Water Board uses this information to make management decisions regarding the estuary.

- What should be the geographic and temporal scope of a regional monitoring program?
- What should be the management framework, including data compilation, assessment, and reporting, for a regional monitoring program?
- What should be the general goals and objective of the program? Which beneficial uses should be assessed? What are the most important parameters to monitor? What kinds of products should the program produce and at what frequency?
- What other efforts should be coordinated with a regional monitoring program? How can various mandates be achieved through a regional monitoring program?
- What resources should support the program? Currently, municipal wastewater, urban stormwater, and agricultural drainage dischargers expend resources to conduct monitoring to characterize the impact of their discharge on receiving waters. How can the current Water Board monitoring be optimized? Are there other programs or efforts that could be leveraged to support regional monitoring?

Monitoring to Characterize Discharges from Delta Islands

Rationale: In 1995 the US Geological Survey estimated total discharges from approximately 680,000 acres of Delta islands at 430,000 acre-feet⁴, representing a large uncharacterized input to the Delta that has potential to impact water quality and hydrology. The drainage discharged from Delta islands consists of precipitation, levee seepage, irrigation runoff and drainage, and surface water withdrawals for other uses. The Water Board's Irrigated Lands Regulatory Program (ILRP) requires monitoring to characterize agricultural-related drainage in the Delta but does not specifically require monitoring of all the drainage discharged from islands directly into Delta waterways. To comply with the ILRP requirements, the San Joaquin County and Delta Water Quality Coalition monitors agricultural drains on several Delta islands; however, only a couple of the drains they monitor discharge directly to Delta waterways.

In addition, the Department of Water Resources (DWR) conducted extensive studies on Staten Island and found that there is need to collect water quality and flow data from additional islands to better characterize the variability among them. DWR's Delta Simulation Model (DSM2) utilizes the Delta Island Consumptive Use (DICU) model to estimate contributions of flow and some water quality constituents from Delta islands. The DICU model uses information on land use, farming practices and climatic conditions to estimate the amount of water diverted from and returned to Delta waterways from the islands. The model has been shown to be less accurate early and late in the growing season. In addition, the model consistently under-predicts seepage

⁴ Drainage-Return, Surface-Water Withdrawal, and Land-Use Data for the Sacramento-San Joaquin Delta, with Emphasis on Twitchell Island, California. 1997. William E. Templin and Daniel E. Cherry (USGS).

and return flows. Additional data for more islands is needed to improve the Delta island drainage models.

Flow and water quality monitoring is needed to identify and quantify potential sources of toxicity or other impacts on Delta beneficial uses, including the POD. These data also are needed to improve and calibrate models for characterizing current conditions and for evaluating and planning future Delta conveyance alternatives. There is need to better understand the quantity, timing, location, and quality of discharges from Delta islands. Potential constituents of concern for assessing impacts to the pelagic organisms in the Delta are ammonia/nutrients, toxicity, pesticides, and metals.

Action: The Water Boards will work with Reclamation Districts and ILRP Coalition groups to monitor discharges from Delta islands.

Current Activities Related to Action:

- In winter 2008, the Central Valley Water Board Surface Water Ambient Monitoring Program (SWAMP) initiated a study to determine whether potential sources of pyrethroid pesticides (i.e., wastewater, stormwater, and agricultural discharges) could be contributing pyrethroid pesticides to Delta surface waterways at high enough concentrations to cause toxicity. The study includes monitoring of Delta island discharges. This study is coordinated with monitoring conducted by the Sacramento Valley and San Joaquin County and Delta Water Quality Coalitions through the ILRP.

Input Sought:

- Should the Water Boards require monitoring of all Delta island inputs and drainage or only a subset of representative islands? If not all islands, then what criteria should be used to select representative islands?
- What is the most critical information that should be gathered with respect to Delta island drainage?

Assess the Potential Impact of Ammonia on Delta Species

Rationale: Recent studies show that elevated ammonia concentrations in San Francisco Bay and Suisun Marsh inhibit nitrate uptake and reduce marine phytoplankton production rates. Less information is available for the freshwater Delta, but researchers suspect that ammonia levels in the Delta may be sufficiently elevated to inhibit phytoplankton production in the Delta as well. Reduced algal production could have profound effects on the abundance and distribution of aquatic organisms in the Delta including those associated with the POD. In addition, IEP researchers suggest that delta smelt and juvenile salmon may be impacted by ammonia levels in the Sacramento River portion of the Delta and in the San Joaquin River in the vicinity of the City of Stockton.

Action: The Water Boards will seek funding to conduct screening studies to determine whether freshwater diatoms and Delta smelt could be impacted by ammonia

concentrations in the Sacramento River. In addition, the Water Boards will coordinate with researchers collecting information on the potential direct toxicity of ammonia to salmon and Delta smelt.

Current Activities Related to Action:

- The State Water Board secured funding to conduct studies to determine Delta smelt sensitivity to ammonia. This work will be conducted in spring 2008.
- Regional Water Board staff will coordinate with entities conducting studies in the San Joaquin River related to potential ammonia toxicity to juvenile salmon.
- The State Water Board is evaluating mechanisms to fund studies of freshwater diatom sensitivity to ammonia. Staff is negotiating the study plan with the principal investigator.
- Regional Water Board staff will meet with CVCWA and review study plans prior to implementation.

Input Sought:

- What long-term ammonia studies should be conducted?
- What should the discharger's role be in the studies?
- Should the Water Board convene a summit to present studies and gather information related to the impact of ammonia on Delta species?

Work With the Department of Pesticide Regulation and Delta County Agricultural Commissioners to Determine the Need for Increased Enforcement of or Additional Restrictions on in-Delta Pesticide Use

Rationale: The POD has heightened awareness of potential sources of contaminants to Delta waterways. One of these is drainage from agricultural lands (as noted above for Delta island drainage). In the Central Valley, irrigated agriculture, including managed wetlands, is regulated by a conditional waiver of waste discharge requirements, which requires water quality monitoring to determine compliance with water quality objectives and development of management plans to address exceedances of water quality objectives. The waiver is managed under the Central Valley Water Board's Irrigated Lands Regulatory Program (ILRP).

As part of the ILRP, the Central Valley Water Board entered into a memorandum of understanding (MOU) with the State Water Board, the California Department of Pesticide Regulation (DPR), and the Butte and Glenn County Agricultural Commissioners to initiate a pilot project to increase local implementation of ILRP requirements. Under the MOU, the State Water Board funds staff to assist the County Agricultural Commissioners in field work activities to support the ILRP including increased pesticide application inspections, field assessment to document management practice implementation, and inspections in areas with potential for pesticide run-off,

among others. This project could be replicated in Delta counties to increase compliance and enforcement by the Agricultural Commissioners to decrease runoff of pesticides, improve application of pesticides, and increase rates of compliance with federal label requirements and State regulations.

In addition, recent studies suggest that pyrethroid pesticides contribute to toxicity in urban and agricultural drainage dominated stream sediments. These results prompted DPR to initiate the process of re-registering pyrethroid pesticides for use in California.

Action: The Water Boards will encourage DPR to expedite their pyrethroid pesticide re-registration process and provide agricultural commissioners with guidance on pesticide use restrictions that could be implemented in the interim. The Water Boards also will work with DPR and Delta County Agricultural Commissioners to determine the need for increased enforcement of or additional restrictions on pesticide use on Delta islands and lands on the Delta's periphery. In addition, the Water Boards are coordinating with UC Davis and others on studies to better define the potential role of organophosphorus and pyrethroid pesticides in the POD.

Current Activities Related to Action:

- A consortium of pesticide registrants, the Pyrethroid Working Group (PWG), submitted to DPR proposals to address data gaps related to the more persistent class of pyrethroid pesticides (type 3). DPR sought stakeholder input on the proposed studies and is working with the PWG to address stakeholder comments.
- The IEP and the Water Boards are cooperating in a monitoring study to measure toxicity in Delta waters and to measure pesticides associated with any toxicity observed.
- The Water Board, with funding from the SWAMP, is conducting pyrethroid pesticide monitoring of potential sources of those pesticides to the Delta.

Input Sought:

- Is the MOU that is being implemented in Butte and Glenn County a good model for Delta counties?
- Are there other coordination activities that could be implemented between DPR, Agricultural Commissioners, and the Water Boards that would help protect Delta aquatic life beneficial uses?

Address Potential Impacts of One-through Cooling at the Contra Costa Power Plant

Rationale: The Contra Costa Power Plant is located near the confluence of the Sacramento and San Joaquin Rivers in the Delta, a key habitat for sensitive Delta species. The facility diverts up to 350 million gallons per day of Delta water for cooling purposes and discharges high-temperature wastewater causing a thermal plume in the receiving water. Studies show that the diversion entrains or impinges several important

Delta species including Delta smelt, threadfin shad, and juvenile striped bass and salmon. The thermal plume also could have impacts on aquatic life.

Action: Prior to the State Water Board's development and adoption of a statewide policy for addressing the impacts of once-through cooling structures on aquatic life, the Central Valley Water Board will consider interim regulatory measures to include in the facility's National Pollutant Discharge Elimination System (NPDES) permit.

Current Activities Related to Action:

- The Contra Costa Power Plant's current permit is based on outdated aquatic life impact studies. The facility is working with the California Department of Fish and Game and the National Marine Fisheries Service to obtain an updated incidental take permit. That process will require additional monitoring and evaluation of take species and identification of avoidance and mitigation measures necessary to address the level of take.

Input Sought:

- What additional information is needed to determine the impacts from the Contra Costa Power Plant's diversion and discharge?

Ongoing Actions

The actions listed below are ongoing, existing Water Board commitments. While they are not the focus of this meeting, they are included for completeness and consistency with the Delta actions resolution. Stakeholders are welcome to comment on these actions; however, recognize that each already established a stakeholder process, which is the appropriate vehicle for providing input.

Delta Waterways TMDLs

Rationale: The Central Valley Water Board is developing and implementing numerous TMDLs for constituents that impair aquatic life beneficial uses in the Delta including OP pesticides, mercury, low dissolved oxygen, salt and boron, selenium, and bacteria.

Current Activities Related to Action:

- The OP pesticide TMDL for Delta waterways was approved by US EPA in October 2007.
- The TMDL for salt and boron at Vernalis was approved by US EPA in July 2006. The salt and boron TMDL for the San Joaquin River upstream of Vernalis will be subject to peer review in 2008 and should be considered for adoption in 2009.
- The TMDL for low dissolved oxygen in the Stockton Deep Water Ship Channel was approved by US EPA in August 2006.
- The Central Valley Water Board will consider the draft mercury TMDL for Delta waterways at their April 2008 meeting.

- The elements of the pathogen TMDL for Stockton urban creeks were incorporated into the Stockton stormwater permit that was adopted by the Regional Water Board in December 2007. The Board will consider adopting the complete TMDL package at their March 2008 meeting.
- The Water Board is conducting fish tissue analyses to determine whether Delta waterways are impaired by selenium.

Central Valley Salinity Management Plan

Rationale: Elevated salinity in surface water and groundwater in California's Central Valley is an increasing problem. The Water Boards have initiated a comprehensive effort to address salinity problems in the Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability referred to as Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS).

Action: The Water Boards will continue efforts to develop a long-term salinity management plan for the Central Valley.

Current Activities Related to Action:

- The State and Central Valley Boards have established a Policy Group to help develop a Central Valley Salinity Management Plan. Four committees of the Policy Group have been meeting on a regular basis to discuss program development as well as technical, economic and public outreach components of the project. Work is being conducted under contract to evaluate the economic impacts of not addressing salinity, assess data gaps, and to prepare a video for broadcast on PBS stations.

Central Valley Drinking Water Policy

Rationale: Surface waters of the Bay-Delta and upstream watersheds provide drinking water supplies for more than 65 percent of California's population. Impairment of these waters poses treatment challenges and public health concerns for people who drink the water. The Water Boards' Water Quality Control Plans include objectives for many constituents that threaten drinking water sources. However, some constituents are not addressed, specifically pathogens, organic carbon, and bromide. The Central Valley Regional Water Board is currently developing a drinking water policy to address these issues.

Action: The Water Boards will develop and consider adopting as a Basin Plan amendment a comprehensive policy and implementation plan to improve water quality for municipal and domestic supply beneficial uses (Central Valley Drinking Water Policy) by the end of 2009.

Current Activities Related to Action:

- A Workgroup comprised of interested stakeholders was convened to assist the Regional Water Board in conducting the technical studies necessary to develop the Central Valley drinking water policy. The Workgroup identified and compiled long-term data sets on drinking water constituents of concern, produced conceptual

models for organic carbon, nutrients, pathogens, and salinity, held focused meetings on economics issues, and initiated work on identifying potential water quality goals and evaluating drinking water treatment. Central Valley Water Board staff will hold scoping meetings in summer 2008.