

Lead Scientist's Report

Summary: This report covers eight items 1) the State Water Resources Control Board's (SWRCB) state-wide survey of contaminants in sport fish, 2) highlights from the recent Delta Science Program and UC Davis Seminar titled, "Tidal Marshes and Native Fishes in the Delta: Will Restoration make a Difference?", 3) a summary of the recent Interagency Ecological Program (IEP) review of juvenile fish monitoring in the Delta, 4) an overview of the Puget Sound Institute workshop on science in ecosystem restoration, 5) findings of "Broad Timescale Forcing and Geomorphic Mediation of Tidal Marsh Flow and Temperature Dynamics" by Enright et al (2013), 6) establishment of a Collaborative Adaptive Management Team to guide a robust and collaborative science and adaptive management program for the next iteration of the Biological Opinions, 7) highlights from "Climate Change Vulnerability of Native and Alien Freshwater fishes of California: A Systematic Assessment Approach" by Moyle et al (2013) and 8) a summary of current numbers relevant to Delta water and environmental management.

SWRCB Survey of Bioaccumulation in Sport Fish

The SWRCB's Surface Water Ambient Monitoring Program has released findings from the first statewide survey of contaminants, including methylmercury, in sport fish from California rivers and streams. Most of the locations in the high contamination category were in the Sacramento-San Joaquin Delta and its nearby tributaries. This study builds on previous SWRCB monitoring and research funded by the CALFED Ecosystem Restoration Program and others to address mercury problems. Monitoring locations were selected in a stratified, randomized manner to increase the study's statistical representativeness. High concentrations around the periphery of the Delta and lower concentrations in the central Delta were observed which align with the patterns observed in past sampling. Current efforts to address mercury contamination issues center on design of wetland restoration projects and prevention of exposure through public education programs. Information on specific fish monitoring locations can be accessed at: http://www.mywaterquality.ca.gov/safe_to_eat/. For the full report please visit: http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml

Seminar: "Tidal Marshes and Native Fishes in the Delta: Will Restoration make a Difference?"

The Delta Science Program along with UC Davis Center for Aquatic Biology & Aquaculture (CABA) and Cal-Neva Chapter of the American Fisheries Society held a workshop on June 10, 2013 to explore the ecological linkages between tidal marshes and fish in the Delta. Presentations and facilitated discussions focused on the benefits tidal marshes provide to fish production and elements of tidal marshes that should be implemented in restoration efforts. Key findings from the workshop presentations, panel discussion, and materials provided during the workshop will be synthesized for a peer review journal manuscript. Video of the seminar and PowerPoint presentations will be

posted in early July. For more information on the seminar visit:
<http://deltacouncil.ca.gov/event-detail/8998>

IEP Delta Juvenile Fish Monitoring Program Review

The IEP Science Advisory Group (SAG), a standing panel of external experts, held a review of the IEP Delta Juvenile Fishes Monitoring Program (DJFMP) and its sub-program the Delta Juvenile Salmonid Survival Studies (DJSSS) on June 4 and 5 to determine if the programs are meeting their present objectives, and their potential to answer future questions and provide information to inform the protection, restoration, and management of naturally produced salmonids and other native species in the Delta.

The DJFMP has been monitoring populations of juvenile Chinook salmon in the Delta since the late 1970s. More recently, the DJFMP has expanded its year-round monitoring to also include steelhead salmon and non-salmonid species (e.g. delta smelt). These studies can provide baselines needed to assess changes in Delta survival anticipated from the BDCP as well as providing data and information per the delta smelt and salmon Biological Opinions.

Recommendations from the SAG review will be summarized and addressed in a final report written by DJFMP and DJSSS staff on July 5, 2013. More information and background materials can be found at:
<http://www.water.ca.gov/iep/activities/reviews.cfm>

Puget Sound Institute Workshop on Advancing the Role of Science in Coastal Ecosystem Recovery

Dr. Peter Goodwin participated in a two-day workshop to address how science can better serve ecosystem recovery by comparing practices and experiences of scientist and practitioners from large-scale coastal ecosystems, such as Chesapeake Bay, Columbia River Estuary and the Louisiana coast. The workshop focused on four themes: 1) setting priorities in the face of uncertainty, 2) effective adaptive management, 3) coordinating scientific efforts and 4) the role of social science in ecosystem recovery. A manuscript that synthesizes the participants' recommendations for improvement will be submitted for publication.

Tidal Marsh Flow and Temperature Regulation

The Delta Science Program's Chris Enright and coauthors recently published an article entitled "Broad Timescale Forcing and Geomorphic Mediation of Tidal Marsh Flow and Temperature Dynamics". The study found a profound tidal and two-week cooling effect on the both the sloughs and the Delta at large due to the majority of high tides occurring during the night. During high tide at night, water floods the marsh and cools the waters before returning to the sloughs, creating areas of cold water in tidal marsh creeks. A natural, well-connected slough in the study experienced greater temperature fluctuations than a leveed slough as it receives larger amounts of tidal marsh flood waters. However, the natural progress of the timing of tides assures that the next century will see more high tides at mid-day which is likely to produce higher water

temperatures. Strong temperature gradients and periodic low temperature refugia have implications for fish survival as well as the management and restoration of tidal marshes. The article may be accessed at:

<http://link.springer.com/content/pdf/10.1007%2Fs12237-013-9639-7.pdf>

Establishment of Collaborative Adaptive Management Team

Delta Science Program staff was invited to participate on a Collaborative Adaptive Management Team, formed as part of a federal and state proposal for modification to the remand schedule for the salmon and smelt Biological Opinions, to implement a collaborative science and adaptive management program. This represents an opportunity to test on a limited scale the type of science program contemplated for the larger, long-term proposed BDCP program, and by extension, the Delta Plan. The envisioned process draws heavily on proposed actions outlined in the forthcoming Delta Science Plan and represents an alternative, more inclusive, and transparent approach to the development of operational strategies associated with the BiOps. The first meeting was held on June 11, with a proposed biweekly schedule through early 2014 to meet the remanded BiOps deadline. Delta Science Program staff will be involved in providing key synthesis products (e.g., outcomes from the predation workshop scheduled for July 22) for the group to recommend specific experimental actions. Staff will use the process as a potential model for implementing objectives in the Delta Science Plan related to early engagement of decision-makers in setting research and monitoring priorities and how new information can be used to optimize State Water and Central Valley Project operations, habitat restoration designs, and reduction of multiple stressors on endangered fish species.

Future of Native and Alien Freshwater Fishes of California

In May of 2013 Dr. Peter Moyle of the University of California, Davis and others published an article on a systematic assessment of the vulnerability of freshwater fish species of California. 82% of the 121 native fish species assessed were classified as highly vulnerable (on the path to extinction). Only 19% of the 50 invasive species show similar risk. The researchers used expert knowledge and literature reviews in two 10-metric modules to score the baseline and future vulnerability of each species. Modules included metrics such as current population size and habitat range, vulnerability to other stressors, dependence on human intervention, tolerance to temperature and precipitation change, capability to change at the same rate as their habitat or move to a new area. While most native species will suffer population declines and restricted distributions, species requiring water colder than 22°C, in particular, are likely face extinction, if the current trend continues. No native fish are likely to benefit from climate change. The study strongly suggests existing knowledge is sufficient to determine species in need of special conservation attention and the establishment of cool-water refuges for native fish is needed even in urban streams. The article can be accessed at: <http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0063883>

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Brown Bag Seminars

The Delta Science Program has two Brown Bag Seminars planned for July:

Seismic risk of levees in peat soils. Dr. Scott Brandenburg and Dr. Jonathan Stewart, UCLA, Tentatively scheduled for July 10 (details to follow)

Marine tidal energy project in the Severn Estuary and ecosystem implications.
Dr. Roger Falconer, Cardiff University, U.K; July 17th; Park Tower conference center, 980 Ninth St., 2nd Floor, Sacramento, CA

By the Numbers

A Delta Science Program Sea Grant State Fellow will present a summary of current numbers related to Delta water and environmental management. The summary will inform the Council of recent counts, measurements and monitoring figures driving water and environmental management issues.

List of Attachments

Attachment 1: By the Numbers Summary

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