

**A Pilot Program for Monitoring, Stakeholder Involvement, and Risk
Communication Relating to Mercury in Fish in the Bay-Delta Watershed
(Fish Mercury Project)**

Revised Project Goals

1. Project Goals

Previous: 1) Protect human health by assessing and reducing exposure to methylmercury-contaminated fish through risk communication

Revised: 1) Protect human health by characterizing fish contamination in the watershed, developing safe consumption guidelines, and reducing exposure to contaminants in fish in the Bay-Delta watershed through risk communication based on environmental justice principles

Explanations: One definition of environmental justice is: The fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no population should be forced to shoulder a disproportionate share of exposure to the negative effects of pollution due to lack of political or economic strength.

www.envirotools.org/glossary.shtml

The goal of assessing and communicating risk based on environmental justice principles means that the study will incorporate these considerations into the monitoring design and education and outreach strategies.

Mercury contamination is the most widespread problem facing populations that consume fish from the watershed. Women and children are key at-risk populations. It is possible that mercury contamination in fish will get worse due to the large scale habitat restoration projects taking place in the watershed. While the emphasis of this project will be on mercury, other pollutants will be incorporated into monitoring and risk communication as the existing budget allows and additional funding opportunities become available.

Previous: 2) Provide “performance measures” to gauge methylmercury contamination of the watershed during restoration and remediation

Revised: 2) Through food web monitoring, determine how habitat restoration and mercury clean-up actions affect methylmercury exposure in the watershed

Explanations: A key goal of CALFED’s Ecosystem Restoration Program is to predict the risks associated with wetland restoration (wetlands in the widest sense of the word – from floodplains, shallow-water habitats, to vernal pools)

and to determine which restoration techniques minimize methylmercury production. Another goal is to be able to show that clean-up of contaminated sites is resulting in lower fish tissue concentrations. The CBDA Mercury Strategy (Wiener et al. 2003) recommended small fish and other aquatic species (biosentinels) as the best single indicator of spatial patterns and trends from year-to-year. Biosentinels are organisms that accumulate methylmercury, are indicators of short-term variation in methylmercury, and have strong site fidelity to small geographic localities where methylmercury production occurs. Biosentinels can be used to measure small spatial and temporal changes in mercury concentrations in wildlife as a measure of the effectiveness of various restoration methods and their undesirable methylmercury production consequences. Since biosentinels are food items for larger fish and wildlife, monitoring them will also provide information on wildlife health risks. Large fish such as largemouth bass have also proven to be valuable in a dual role of providing information on 1) spatial and temporal trends and 2) human exposure.

“Food web” is a term that includes all of the aquatic organisms living in an ecosystem. Humans that consume fish are part of the aquatic food web. This study will focus on measuring mercury in sport fish and small fish.

“Exposure” refers to the exposure of humans and wildlife to methylmercury.

Previous: 3) Establish an organizational and technical foundation for cost-effective, scientifically defensible monitoring of mercury in the watershed that meets the identified needs of end users and is coordinated with related science and management efforts

Revised: 3) Establish an organizational and technical foundation for cost-effective and scientifically defensible monitoring of mercury and other pollutants in the watershed that meets the identified needs of end users

Explanations: Credible and accessible information is the foundation for environmental management and public health protection. Cost efficiencies can be achieved through coordination with other projects and through careful design of sampling and analytical plans. In order to provide the greatest benefit, monitoring should be closely linked to the biggest questions faced by environmental managers and other users of the monitoring data.

Added Goal: 4) Coordinate with the major ongoing science, management, and risk communication efforts to achieve efficiencies of scale and scope

Explanations: Effective communication among stakeholders (recreational and subsistence anglers, educators, natural resource trustee agencies, and public

health officials) can lead to economies of scale and scope, as well as avoidance of costly mistakes. Major programs include large-scale projects sponsored by the California Bay-Delta Authority, the Army Corps of Engineers, the State Coastal Conservancy, the Fish and Wildlife Service, and the California Department of Fish and Game.

Responses to suggestions that we did not incorporate into Goals and Objectives

- 1) The goals need to state more explicitly the research means (what, where, and why).
Response: Goal statements are by definition fairly general, and the research means are described in the scope of work and in the forthcoming monitoring plan for 2005.
- 2) How will impacts be mitigated after analysis and assessment is completed?
Response: The physical mitigation aspects are not part of this project, but mitigation through risk reduction will be. Some limited information already exists in some parts of the watershed (see Bob Brodberg's slides), and new information generated through the monitoring component will be incorporated into the communication aspects of this project.
- 3) The efficacy of communication efforts to different socio-economic groups should be evaluated.
Response: While measuring the efficacy of communication efforts to different socio-economic groups would be a very valuable effort, it is beyond the scope of this project.