

**Subject:** Chronic Fish Impairment Studies

**Background:** Riverine and Delta populations of phytoplankton, zooplankton, and many important fish species are in decline. The presence of elevated concentrations of pesticides, including chlorpyrifos and diazinon, in the Bay Delta poses a threat to the aquatic ecosystem. While these pesticide levels are not likely to be high enough to cause acute toxicity to fish, it is unknown what their chronic impacts may be on important fish species.

Although CALFED has funded projects to develop management practices to be used to reduce pesticide loading from agricultural and urban sources, a study of the effects of contaminants on Delta smelt, and a Delta bioassay-toxicity study, it is also necessary to fund a study to fill this important data gap. A monitoring and research program, combined with other ongoing and proposed studies, would provide a comprehensive analysis of contaminant effects on Delta fish populations.

**Proposed Action:** The proposed action is to implement a three-year monitoring and research program to evaluate the direct chronic impacts of contaminants, with an emphasis on pesticides, on important Delta fish species. Program elements should include (a) refinement of existing, or development of new, bioassay protocols for sensitive life history stages of important Delta fish, including splittail, Delta smelt, salmon, and striped bass, (b) seasonal bioassay screening at sites throughout the Delta and at selected upstream sites using species at appropriate life history stages to provide data on potential population level effects, and (c) toxicity evaluations to determine the toxicants responsible for observed toxicity. It is recommended that an expert panel develop the proposal for this study, and then a focused grant process be used to determine the entity/entities which will complete the actual research.

**Geographic Area:** The Delta would be the primary area of focus. Some work would need to be conducted upstream to account for the anadromous species.

**Recommended Funding:** \$700,000

**Coordination/Overlap with Existing Studies:** There is no comprehensive program that will provide the knowledge about the impact of chronic contaminant exposure to Delta fish species. This proposed research program should be coordinated with the CALFED funded studies by DeltaKeeper (toxicity-bioassays in the Delta), the proposed CALFED funded studies to determine the sources of toxicity to algae and invertebrates, and the ongoing Sacramento River Watershed Program's water quality testing.

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