Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation, and Ecotoxicological Risk to Avian Reproduction (aka Mercury in Birds in SF Bay)

Lead Agency: US Fish and Wildlife Agency
Grant Number: ERP-02D-C12

About the Project:
The Bay-Delta watershed has a legacy of mercury contamination from both the mercury mined from the Coast Range and the gold extracted from the Sierra Nevadas. With the goal of better understanding mercury bioaccumulation as well as providing information that could be used in setting appropriate human and ecotoxoicological endpoints, the Mercury in Birds in SF Bay Project was initiated. This project evaluates the affect mercury in the environment has on three guilds of birds (i.e., recuvirostrids, terns, and diving ducks). Each of these birds represents a unique component of the foodweb and foraging pathway within the Bay-Delta ecosystem for mercury bioaccumulation.

Primary Project Goals:

- Document the pathways of mercury exposure to these birds and quantify the mercury biomagnification through the food web in order to develop an understanding of the factors affecting the variability in degree of exposure within and between the various guilds.
- Quantify the effects of mercury and other chemicals of concern (like selenium) on avian reproduction in the Bay-Delta ecosystem.
- Establish and quantify dose-response relationships for methylmercury in avian eggs using controlled laboratory-based studies.

Accomplishments:
From this study, we have learned:

- Some bird species are more sensitive than others to mercury in the environment.
- Mercury in the bird eggs studied is above the effects threshold for terns, rails, and other species.
- Slower growth in tern chicks is associated with those that have been exposed to mercury.
- Mercury concentrations in SF Bay waterbirds (i.e., tern livers) are above levels associated with deleterious effects in other species.

Partners:
The Mercury in Birds in SF Bay project partners include the US Fish and Wildlife Service, the US Geological Survey, and the Point Reyes Bird Observatory.