

## Using fin ray microchemistry to reconstruct migratory histories from White Sturgeon captured in the San Joaquin River and San Francisco Estuary, California

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The primary goal of the U.S. Fish and Wildlife Service Anadromous Fish Restoration Program is to “make all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis” (USFWS 2001). Currently, recovery efforts for sturgeon are hampered by a paucity of basic life history information. Previous research has focused primarily on monitoring efforts and tagging studies which have gathered information for only a small portion of the sturgeon life cycle. Analyzing fin ray strontium isotope ratios ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) via laser ablation MC-ICP-MS provides a potential non-lethal method to resolve fine-scale movement patterns in sturgeons (*Acipenseridae*). We conducted a pilot laboratory experiment where juvenile White Sturgeon *Acipenser transmontanus* were exposed to two water sources with distinct strontium isotope ratios. This experiment confirmed that the resulting fin ray strontium value accurately reflects that of the water source to which the sturgeon was exposed. Then, we examined pectoral fin ray sections from adult White Sturgeon collected from the San Joaquin River and the San Francisco Estuary by recreational anglers, state and federal monitoring programs. Preliminary results indicate strontium isotope ratio profiles from the wild fin rays were highly variable across individuals and through time, indicating that most individuals spent the majority of their life in the estuary, with some evidence of marine migration. Freshwater strontium isotope values were not commonly observed, even within the first annulus. We expect the results of this work will help guide future restoration decision through increased knowledge of sturgeon life history.

### Literature Cited:

USFWS. 2001. Final Restoration Plan for the Anadromous Fish Restoration Program. A plan to increase natural production of anadromous fish in the Central Valley of California. Prepared for the Secretary of the Interior by the United States Fish and Wildlife Service with the assistance from the Anadromous Fish Restoration Program Core Group under authority of the Central Valley Project Improvement Act. Released as a revised draft on May 30, 1997 and adopted as final on January 9, 2001