

The Use of Strontium Isotope Ratios $^{87}\text{Sr}:^{86}\text{Sr}$ in Otoliths and Fin Rays to Inform Ecology, Conservation, and Management of Fishes in California

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In-situ chemical analysis (strontium isotope ratios) of calcified structures (e.g., otoliths and fin rays) is a useful tool for reconstructing movement and habitat use patterns of individual fish. Such analyses provide enhanced inference regarding critical spawning and nursery habitats, migration history, diversity in life history strategies, and discrimination between wild- versus hatchery-spawned individuals in adult populations. The California Central Valley receives runoff from the Sierra Nevada range and provides water to 35 million people and supports a multi-billion-dollar agricultural industry. These freshwaters also flow into the San Francisco Estuary which is critical habitat to many native anadromous, partially anadromous, and semi-anadromous species of fishes; many of which are threatened with extinction or are commercially important. For the last decade, we have used in-situ laser ablation MC-ICP-MS to better describe the ecology of native fishes and enhance specific conservation and management efforts in California. Here I will provide an overview of our studies on osmerid smelts, Chinook Salmon *Oncorhynchus tshawytscha*, and White Sturgeon *Acipenser transmontanus*; describing our techniques, major findings, and how our work can and has informed management and conservation efforts.