

## Work Task C38: Stable Isotope and Microchemistry Analyses of Fin Rays to Determine Habitat Use and Movement Patterns of Razorback Sucker in Reach 3

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate
\$0	\$0	\$0	\$80,000	\$0	\$0	\$0

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**Start Date:** FY10

**Expected Duration:** FY10

**Long-term Goal:** Assess the effectiveness of the fish augmentation program.

**Conservation Measures:** RASU3, RASU6

**Location:** Reach 3 to include main stem and backwater habitats.

**Purpose:** To determine unknown hatchery origins and habitat use of RASU within Reach 3 using strontium isotope microchemistry analyses of fin rays.

**Connections with Other Work Tasks (past and future):** This work is related to C29 and D8. Fin ray segments that were collected for aging will be retained and further analyzed relative to their stable isotope and microchemistry composition. The results of this work will assist in directing our system monitoring efforts for the program.

**Project Description:** This study is to determine hatchery origin and age-related habitat use for RASU within Reach 3 of the Colorado River using strontium isotope ratios ( $^{87}\text{Sr}:$  $^{86}\text{Sr}$ ) of pectoral fin ray samples used in the Reach 3 aging study. The use of stable isotopes and microchemistry analyses of bony structures, which utilize naturally occurring chemical compounds from the fish's environment throughout its lifetime, is a promising measure of hatchery origin and habitat use. Matching chemical signatures found in a specific river and hatchery locations with fin ray samples collected during the aging study may identify the association of successful hatchery stockings and age-specific habitat use of repatriated RASU introduced under the Lake Havasu Fishery Improvement Project and the Lower Colorado River Multi-Species Conservation Program.

**Previous Activities:** N/A

**FY09 Accomplishments:** RASU fin ray samples were obtained under C29 (fin ray tissues) for aging analyses.

**FY10 Activities:** Samples from more than 300 RASU collected from Reach 3 of the Colorado River in FY09, along with water samples collected throughout Reach 3 (river, backwaters, hatcheries, etc.), were provided to the University of California, Davis for quantifying  $^{86}\text{Sr}$ : $^{88}\text{Sr}$  isotopic ratios. An oral presentation of results was given at the CRAB meeting in Laughlin, Nevada. Results from analyses suggest that there is too little separation between sites and that fish did not appear to spend enough time in any one habitat or water mass to allow differentiation at a level that would be useful to LCR MSCP researchers. A completion report will be prepared.

**Proposed FY11 Activities:** The project will be completed in FY10.

**Pertinent Reports:** A research report titled, *Using Strontium Isotope Microchemistry Analyses of Fin Rays to Determine Hatchery Origin of Razorback Sucker (*Xyrauchen texanus*)*, by Donald E. Portz (Reclamation), James A. Hobbs, and Naoaki Ikemiyagi (Interdisciplinary Center for Plasma Mass Spectrometry) is in preparation and will be available in FY10.