

Work Task C48: Genetic Characterization of RASU Brood Stock at SNARRC

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
\$60,000	\$50,590.60	\$98,254.83	\$0	\$0	\$0	\$0

Contact: Jim Stolberg, (702) 293-8206, jstolberg@usbr.gov

Start Date: FY11

Expected Duration: FY12

Long-term Goal: To maintain an effective fish augmentation program.

Conservation Measures: RASU3, RASU4.

Location: Southwestern Native Aquatic Resources & Recovery Center (formerly Dexter National Fish Hatchery & Technology Center).

Purpose: To genetically assess RASU captive brood stock.

Connections with Other Work Tasks (past and future): B2, B4, B5, B10, C10, and C31.

Project Description: This two-year study will compare the genetic diversity of captive RASU brood stock and the source stock in Lake Mohave. The Southwestern Native Aquatic Resources & Recovery Center (SW Native AR & RC) maintains three different stocks of RASU that originated from Lake Mohave. Concern has been expressed that captive fish stocks have lowered genetic diversity and thus less utility for conservation activities. To address this concern, razorback sucker broodstocks will be tested to ensure that they are genetically diverse and representative of wild or repatriate populations. Levels of inbreeding, allelic diversity, and statistical measures used to identify genetic divergence will be calculated.

Previous Activities: This effort builds upon research from B4, B10, C11, and C31. In FY11 the genetic status of RASU broodstocks held at the SW Native AR & RC was documented by determining their mitochondrial diversity and comparing it to the diversity found in the Lake Mohave RASU population. In addition, the genetic status of captive stocks at the SW Native AR & RC and the Ouray and Grand Valley hatchery complex were characterized using microsatellites. Analyses demonstrated that overall the RASU broodstocks were high in genetic diversity and did not show signs of inbreeding. However, diversity was found to be lower in Ouray and Grand Valley stocks. The genetic analyses performed to date indicate that these two hatchery stocks are still providing genetically appropriate production fish for conservation activities.

FY12 Accomplishments: During FY12, the genetic diversity and pairwise relatedness of individual RASU from the Ouray National Fish Hatchery Grand Valley Unit was determined and compared to those estimates for wild Lake Mohave individuals and the broodstocks held at the SNARRC. The purpose of this comparison was to determine if the Grand Valley hatchery broodstocks are proportionally more related than other stocks and if randomly selecting Grand Valley individuals for spawning without tracking family lots can be accomplished while not altering genetic diversity through inbreeding. Tissue samples were taken from a total of 96 RASU at the Grand Valley hatchery for the purpose of genomic DNA extraction. In summary, the samples from the Grand Valley unit had fewer alleles (lower allelic richness) than the other stocks. Recommendations resulting from DNA analyses include continued tracking of family lots and unique matings, or performing a rapid response study to genetically screen individuals prior to spawning for the purpose of determining relatedness and inbreeding levels. All information obtained during this two-year study is being used to update the 2003 *Genetics Management and Captive Propagation Plan*.

FY13 Activities: Closed in FY12.

Proposed FY14 Activities: Closed in FY12.

Pertinent Reports: The 2011 *Razorback Sucker Broodstock Evaluation and Genetic Monitoring* annual report and the 2012 *Razorback Sucker Broodstock Evaluation and Genetic Monitoring* annual report have been completed and will be posted to the LCR MSCP website.