

Work Task C48: Genetic Characterization of RASU Brood Stock at Dexter NFH

| FY11 Estimate | FY11 Actual Obligations | Cumulative Expenditures Through FY11 | FY12 Approved Estimate | FY13 Proposed Estimate | FY14 Proposed Estimate | FY15 Proposed Estimate |
|---------------|-------------------------|--------------------------------------|------------------------|------------------------|------------------------|------------------------|
| \$60,000 | \$50,572.34 | \$50,502.41 | \$60,000 | \$0 | \$0 | \$0 |

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Start Date: FY11

Expected Duration: FY12

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

Conservation Measures: RASU3, RASU4.

Location: Dexter National Fish Hatchery.

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 at Lake Mohave. Dexter NFH 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 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.

FY11 Accomplishments: During FY11, the genetic status of RASU broodstocks held at the Dexter NFH 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 Dexter and Grand Valley were characterized using microsatellites. A total of 657 genetic samples were taken from individual RASU from these four locations. Analyses demonstrated that overall the RASU broodstocks were high in genetic diversity and did not show signs of inbreeding as indicated by high heterozygosity. However, diversity was lower in Ouray and Grand Valley stocks than in either the Dexter stocks or the Lake Mohave samples. Dexter NFH and Ouray NFH are responsible for a majority of the spawning activities that provide other facilities with eggs and larvae for grow-out. The genetic analyses performed to date indicate that

these two hatchery stocks are still providing genetically appropriate production fish for restoration activities.

FY12 Activities: Additional analyses will be performed in FY12 and are to include pairwise relatedness analyses of all individuals potentially used for production at the Ouray NFH, and a comparison between relatedness estimates found within hatchery stocks and those found in wild stock to determine if hatchery broodstocks are proportionally more related than the wild stocks. Information obtained during this and the previous study year will be used to update the 2003 *Genetics Management and Captive Propagation Plan*.

Proposed FY13 Activities: Closed in FY12.

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