

Work Task C31: Razorback Sucker Genetic Diversity Assessment

FY13 Estimate	FY13 Actual Obligations	Cumulative Expenditures Through FY13	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
\$130,000	\$131,290.14	\$531,107.24	\$130,000	\$140,000	\$140,000	\$140,000

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Start Date: FY09

Expected Duration: FY18

Long-term Goal: Maintain genetic quality of RASU utilized in the LCR MSCP.

Conservation Measures: RASU2, RASU3, RASU5, RASU6.

Location: Wayne State University, Detroit, Michigan.

Purpose: To maintain a sound genetic management program for RASU within the LCR MSCP.

Connections with Other Work Tasks (past and future): This work is related to larval RASU collections (B1) and to management of fish habitat restoration sites (for example, E14, F5, and C40). Larval and adult tissue samples are collected from each Reach of the program wherever RASU are captured. This includes work accomplish under work task D8, C13, C33, C45, C49.

Project Description: This study will monitor genetic structure of RASU communities in reservoirs, river reaches, and off-channel habitats within the LCR and characterize the various RASU stocks relative to the founder population from Lake Mohave. Our fish augmentation program continues to produce large numbers of fish annually and these large pulses of fish have the potential to change the genetic diversity of a population in a short period of time. It is important to monitor the genetic structure of the various razorback sucker communities over many years in order to detect changes in the genetic diversity as these populations mature.

Larval fish and adult fin clips will be collected and preserved from each stock during numerous annual surveys and the continuing Lake Mohave larvae collections. These samples will be delivered to genetics research laboratory for analyses. Results will be used to determine the genetic health of these communities, to assess effectiveness of the Fish Augmentation Program, to continue monitoring of the Lake Mohave repatriation effort, and to provide guidance on management of razorback sucker populations developing in newly constructed floodplain habitats within the LCR MSCP area.

Previous Activities: Samples of larvae and adult fin clips were obtained on an annual basis from multiple time periods and from various spawning areas, reservoirs, river reaches, and off-channel habitats within the LCR MSCP area. DNA was extracted and samples characterized for mtDNA and microsatellite variation. Analyses of microsatellite data collected over the past 15 years are consistent with those from mtDNA, indicating that the razorback sucker conservation strategy employed in Lake Mohave is maintaining genetic diversity in the nuclear genome as well. Interpretation of the data in the context of effective number of breeders and census size identifies the importance of increasing census population size in Lake Mohave.

FY13 Accomplishments: In Lake Mohave levels of molecular variation (as measured by mtDNA and microsatellites) remain consistent with previous years, indicating that levels of genetic variation continue to be maintained by the current management program. As long as adult population size remains low, however, there are concerns over the impact of random effects on this population.

Increased sampling of the Lake Mead population indicates that levels of genetic variation remain low, causing some concern. In addition, the population in Lake Mead appears to be diverging from Lake Mohave.

FY14 Activities: LCR MSCP will continue to assess razorback sucker genetics for the LCR through analyses of razorback sucker fin clips and larvae collected from spawning areas, reservoirs, river reaches, and off-channel habitats within the LCR MSCP area.

Proposed FY15 Activities: Collection of larval razorback sucker and fin clips will continue from spawning areas within the LCR MSCP area. DNA will be extracted and samples characterized for mtDNA and microsatellite variation. Due to the small population size, future work will continue to evaluate potential problems related to the effective number of breeders.

Budget estimates have increased for FY15 to represent the actual increases in obligations associated with this work task. The project duration and budget has been extended through FY18 to continue this effort, which is directly related to maintaining a genetic refuge in Lake Mohave (conservation measure RASU5). This research will be re-assessed at that time to determine the appropriate level of effort required to adequately address genetic diversity of razorback sucker in Lake Mohave.

Pertinent Reports: *Continuing Studies of Razorback Sucker Genetics: 2008, Interim Report: 2010, Razorback Sucker Genetic Diversity Assessment: Final Project Report 2011; and Razorback Sucker Genetic Diversity Assessment: Interim Report 2012* are posted to the LCR MSCP website. *Razorback Sucker Genetic Diversity Assessment: Final Report 2013* is completed and will be posted to the LCR MSCP website.