

Work Task C12: Demographics and Post-Stocking Survival of Repatriated Razorback Suckers in Lake Mohave

FY07 Estimates	FY07 Actual	Cumulative Accomplishment Through FY07	FY08 Approved Estimate	FY09 Proposed Estimate	FY010 Proposed Estimate	FY11 Proposed Estimate
\$185,000	\$184,686	\$358,262	\$215,000	\$200,000	\$200,000	\$200,000

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Start Date: FY06

Expected Duration: FY11

Long-term Goal: Species research.

Conservation Measures: RASU5.

Location: Reach 2, Lake Mohave, AZ/NV.

Purpose: Assess population structure for repatriated RASU, and develop a population demographic model for predicting survival and replacement rates to maintain brood stock for duration of the LCR MSCP.

Connections with Other Work Tasks (past and future): None.

Project Description: This activity will support ongoing RASU conservation efforts at Lake Mohave to develop and maintain a population of 50,000 adult RASU as a genetic refuge. More than 120,000 fish have been reared and repatriated to date, yet brood stock population estimates remain below 3,000 fish. The study will assess causes for poor survival of stocked RASU and make recommendations for corrective actions.

Extensive radio and sonic tracking of fish will be used to assess distribution and survival. Demographic modeling will be used to assess population structure. The study is designed as a multi-year, iterative process. Observations and conclusions from first-year activities will provide direction for work in subsequent years.

Initially planned as a 3-year study, findings in FY06 and FY07 showed that the 300-mm size RASU being released by the LCR MSCP were being eaten by predators immediately after stocking with less than 20% of the fish surviving the first 90 days. This prompted a need to evaluate stocking of adult size RASU (500 mm fish). Rearing of these larger fish has taken longer than expected. Only a few hundred fish were available for research subjects during fall 2007. Upwards of 1,000 fish should be available for controlled release tests scheduled for fall 2008, and a second group of large fish should be available for release in FY09. These fish will be

monitored and their relative survival assessed for 18 to 24 months. Field studies are now expected to be completed at the end of FY10, with a final completion report available in FY11.

Previous Activities: Rearing, stocking, and recapture data for RASU stocked into Lake Mohave since 1992 were collated and reviewed. Field investigations were implemented during spawning and post-spawning seasons to assess repatriate distribution. Telemetry work was initiated to examine post-stocking dispersal rates, habitat selection, and short-term mortality, and to verify existing population models. A population model was refined using new data to estimate abundance and to describe critical, dynamic life table features such as mortality rates. Data are being acquired to assist in the quantitative assessment of fish predators as a mortality factor for newly stocked RASU.

FY07 Activities: A sonic telemetry study was completed to assess post-stocking mortality factors for subadult RASU in Lake Mohave. Mortality began immediately after stocking and continued throughout the study. Weekly survival was 92% (95% CL, 87 to 95%). Only 3 of 19 (16%) fish remained active at the conclusion of the study, and mortality likely was due to predation by piscivorous nonnative fishes.

In conjunction with the telemetry study approximately 500 subadult RASU were stocked at Fortune Cove. Large-mesh gill nets set for three days during and after the release event captured no fish of any species. Direct underwater observations of the releases indicated that most stocked fish dispersed shoreward and fewer than 30% of fish moved toward open water.

As a quality control check, and to assure that mortalities in test fish were not a result of implant surgery, transmitters were also implanted into RASU held in a raceway at Willow Beach NFH. All fish remained healthy throughout the experiment and there were no shed transmitters.

Annual monitoring for repatriated and wild RASE has continued with sampling trips in November 2006 and March and May 2007. Capture data as well as mark-recapture estimates of population size have continued to show a decline in wild abundance and a nearly stable but low abundance of repatriated fish despite continued stockings.

Progress in ecological modeling has included acquiring specific location data for catch records where location records are incomplete or too general to maximize the number of fish included in a multi-site analysis. Multi-site mark-recapture analysis of Native Fish Work Group data from Lake Mohave dating back to 1991 has been restricted to March roundup data.

FY08 Activities: Activities during FY08 will continue investigations initiated in FY07, including determining survival of target fish released throughout Lake Mohave. Additional tasks will be determined on the basis of results obtained during the second year of the study. Population demographic modeling will continue. Year-around mark-recapture analysis, restricted to the last 3-4 years, will be conducted in FY08.

Additional sonic telemetry studies will be conducted using large size RASU. If available, study lots of 500 or more fish of 50 cm TL will be released along with the sonic tagged fish. Survival of these fish will be assessed over a 2-year period (preferably covering two spawning periods).

Proposed FY09 Activities: Work will focus on continued monitoring of larger RASU stocked during FY08 to refine the relationship between survival and total length at time of release. Monitoring will be expanded to assess relative contribution of larger fish reared in off-channel areas such as Beal Lake and Yuma Cove.

Pertinent Reports: An annual report will be posted to the LCR MSCP Web site. The study plan is available upon request from the LCR MSCP.