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

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY012 Proposed Estimate	FY13 Proposed Estimate
$200,000	$184,842.91	$717,832.93	$200,000	$200,000	$0	$0

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Start Date: FY06

Expected Duration: FY11

Long-term Goal: Species research

Conservation Measures: RASU5

Location: Reach 2, Lake Mohave, Arizona/Nevada

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

Connections with Other Work Tasks (past and future): This activity uses data managed under G1 and collected under C23.

Project Description: This activity will support ongoing RASU conservation efforts at Lake Mohave to develop and maintain a population of 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 2,000 fish. The study will assess causes for poor survival of stocked RASU and make recommendations for corrective actions.

Previous Activities: Rearing, stocking, and recapture data for Lake Mohave were collated and reviewed. Field investigations were implemented during spawning and post-spawning seasons. Telemetry work was initiated to examine post-stocking dispersal, habitat selection, and short-term mortality, and to verify existing population models. A population model was refined to estimate abundance and to describe critical, dynamic life table features such as mortality rates. Data were acquired to assess fish predators as a mortality factor for stocked RASU.

Extensive radio and sonic tracking of fish were used to assess distribution and survival. Demographic modeling was used to assess population structure. The study was designed as a multi-year, iterative process. Observations and conclusions from first-year activities provided direction for work in subsequent years. Initial findings showed that the 300-mm

TL RASU that were released were being eaten by predators immediately after stocking, with less than 20% surviving the first 90 days. This prompted a need to evaluate stocking of adult size RASU (500 mm TL). Rearing of these larger fish has taken longer than expected. Only a few hundred fish were available for research subjects during 2007.

The sonic studies initiated in 2007 were continued in 2008 and a second, six-month interval of the sonic telemetry portion of this task was completed. This work compared post-stocking survival of subadult (avg. TL 380 mm) and adult (avg. TL 500 mm) RASU repatriates. At the conclusion of the study, 1 of 15 (7%) tagged subadult fish and 5 of 14 (36%) tagged adult fish remained active. For subadult fish in the telemetry study, first-week survivorship was estimated at 82%. For adult fish in the telemetry study, first-week survivorship was estimated at 95%. Mortality was likely due to predation by nonnative striped bass.

Annual monitoring for repatriated and wild RASU continued. Capture data continued to show a decline of the original wild population that had existed prior to the repatriation program. The repatriate population maintained a low abundance but was stable despite only a small number of RASU repatriates (< 1,000 individuals) being stocked during FY08.

FY09 Accomplishments: The sonic telemetry study initiated in 2008 was completed in 2009. Twenty adult and 10 subadult razorback sucker were implanted with sonic transmitters and released at Fortune Cove on November 6, 2008. One fish was removed from analysis because it was contacted only once immediately after release. At the conclusion of the study (over the six-month study period), 6 of 9 (67%) subadult and 16 of 20 (80%) adult razorback sucker remained active. Five transmitters were recovered from the bottom of the lake by a SCUBA diver. No fish remains were observed near any recovered transmitters.

Based on monitoring data from 2008 and 2009, the current wild razorback sucker population in Lake Mohave is 70 fish. The repatriated razorback sucker population is estimated to number 1,502 with a 1% estimated survival of all repatriates released as of March 2008. The current total population estimate for razorback sucker in Lake Mohave is 1,572.

FY10 Activities: Work will continue to focus on monitoring larger RASU stocked during FY09 to refine the relationship between survival and size at release. Contingent on the results of remote sensing evaluation (C23), remote PIT-scanning units will be deployed in conjunction with annual RASU monitoring efforts on Lake Mohave. Post-stocking demographics for the repatriate population will be estimated using mark-recapture data, and additional statistical analyses of the LCR MSCP database (G1) will continue in order to assess factors affecting post-stocking survival.

Proposed FY11 Activities: PIT-scanning results will be evaluated and the usefulness of this technique as an assessment tool will be made. A review of Lake Mohave Native Fish Work Group goals will be made and recommendations for continued monitoring will be

made. Data collected over the entire period will be summarized for inclusion into a final report. Final modeling activities to assess survival and replacement rates for Lake Mohave RASU brood stock will be completed. A final report will be prepared and submitted for review.

Pertinent Reports: *Demographics and Post-stocking Survival of Repatriated Razorback Suckers in Lake Mohave 2008 Final Report* is posted on the LCR MSCP Web site.