Work Task C33: Comparative Survival of 500-mm Razorback Sucker Released in Reach 3

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
$100,000	$97,020.68	$405,396.25	$100,000	$0	$0	$0

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Start Date: FY09

Expected Duration: FY13

Long-term Goal: To maintain the effectiveness of the Fish Augmentation Program.

Conservation Measures: RASU3, RASU6

Location: Mainstem river within Reach 3 and various off-channel fish grow-out ponds.

Purpose: To determine the relative survival of 500-mm TL RASU versus 300-mm TL RASU released into Reach 3.

Connections with Other Work Tasks (past and future): This work is related to current fish rearing (B2, B5), fish research (C12, C13), post-development monitoring (F5), and any future work tasks for rearing RASU, as data collected from this study will help evaluate the effect that size of released fish has on survival, and ultimately, on conservation of the species.

Project Description: This study will evaluate the relative survival of 500-mm TL RASU versus 300-mm TL RASU released into the Lower Colorado River within Reach 3. Ongoing studies at Lake Mohave (C12) suggest that RASU being raised for brood stock development in that reservoir (Reach 2) should be held in captivity and reared to a total length of 500 mm prior to repatriation in an attempt to increase survival. It has been suggested that the LCR MSCP should increase its target size for RASU being reared under the Fish Augmentation Program from 300 mm to 500 mm TL.

A cause for the adult mortality of stocked RASU in Lake Mohave is predation by large striped bass, combined with a lack of turbidity. RASU in Lake Mead (Reach 1) have shown consistent, albeit low-level recruitment for the past 20-plus years. Research (C13) suggests that turbidity is the key component allowing such survival and recruitment. Both predator loads and the amount of turbidity within Reach 3 differ from what is available in Reach 2. Before this management strategy is agreed to and applied to Reach 3, it is prudent to make paired releases of both 300-mm TL RASU and 500-mm TL RASU and compare the relative survival of the two size classes.

This work will be conducted over a 5-year period. The first several years focused on growing and tagging sufficient numbers and sizes of RASU and releasing them into the

river system. The LCR MSCP is currently stocking RASU of 300 mm or greater total length into Reach 3. Under the Fish Augmentation Program, 300-mm TL RASU are credited to the program when stocked into off-channel habitats as well as into the mainstem river. Funds from this study have been used to support harvest, tagging, and distribution of large RASU (500 mm or greater TL) harvested from these off-channel habitats.

Previous Activities: More than 38,000 RASU (>300 mm TL) have been PIT tagged and released into Reach 3 and its associated floodplain since October 2006, and all are research subjects for this study. More than 28,000 RASU have either been stocked directly into the main channel or redistributed into the main channel following grow out at off-channel habitats, of which 3,555 were greater than 400 mm TL. The remaining fish are still growing in various off-channel habitats that are currently being managed by the LCR MSCP and/or USFWS.

Monitoring the growth of RASU in various off-channel habitats has continued. An interagency agreement was initiated between Reclamation and the USFWS to cover costs at off-channel habitats that the USFWS currently manages. These off-channel habitats are the source of larger RASU that will be used to complete this work task.

Numerous additional spawning groups of RASU were located throughout Reach 3. It is expected that surviving fish are best censused while spawning; therefore, identifying spawning sites increases chances for recontacting these fish during future surveys related to this work task.

Analysis of data through 2011 showed relative capture probabilities for four size classes (< 300 mm, 300-349 mm, 350-399 mm, and ≥400 mm) of 1.35, 1.29, 2.84, and 3.07 percent, respectively. These capture probabilities were significant for all size classes. This illustrates a positive correlation between size at release and capture probability, which is a clear indication of survival.

FY12 Accomplishments: Remote PIT scanning data were incorporated into the censusing and data analysis for this project. The combination of remote PIT scanning and regular sampling methodologies totaled 1,006 fish contacts in 2012; this is more than a three-fold increase from previous years. The relative capture rates for RASU were directly related to the size of fish at release. Fish released in the higher size classes, greater than 500 mm, were contacted at a rate of 3.2 to 10.3 times greater than fish released in any other individual size class of fish less than 449 mm. Individuals were also significantly more likely to be contacted if released in the spring months than the autumn. Data collected for this project was also used to generate a population estimate of 2,770 individuals.

FY13 Activities: The combination of remote PIT scanning and traditional sampling methodologies will continue for FY13. The high contact rates of remote PIT scanning over data from multiple seasons will allow us to make inter-year comparisons and provide opportunities for more complete data analysis. It is expected that the results of these additional analyses will form a foundation upon which to base recommendations to adjust the Reach 3 stocking program to enhance the post-release survival of repatriated

fish. As this is the final year of the project, monitoring with remote PIT scanners will be incorporated into the standard monitoring program. Other factors affecting survival will continue to be analyzed as data sets become more robust.

Proposed FY14 Activities: Closed in FY13.

Pertinent Reports: A report titled, *Comparative Survival of Repatriated Razorback Sucker in Lower Colorado River Reach 3,* has been completed and will be posted to the LCR MSCP website.