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

| FY11 Estimate | FY11 Actual Obligations | Cumulative Expenditures Through FY11 | FY12 Approved Estimate | FY13 Proposed Estimate | FY14 Proposed Estimate | FY15 Proposed Estimate |
|---|---|---|---|---|---|---|
| $100,000 | $50,844.82 | $326,891.97 | $100,000 | $100,000 | $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 to assure 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.

The primary cause for mortality in Lake Mohave is predation by large striped bass, combined with a lack of cover. RASU in Lake Mead (Reach 1) have shown consistent, albeit low-level, recruitment for the past 20-plus years. Research (C13) suggests that cover is the key component allowing such survival and recruitment. Both predator loads and the amount of cover 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 five-year period. During the first two years, the focus will be 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 will be 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 35,000 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 24,000 have either been stocked directly into the main channel or redistributed into the main channel following grow out at off-channel habitats, of which 2,086 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 the 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.

**FY11 Accomplishments:** Large numbers of RASU in excess of 500mm TL have been difficult to obtain, and approximately 500 fish in excess of 450mm TL were harvested from off-channel habitats and released into the main channel near Needles, CA. The reduced target size should still allow for meaningful analysis in determining the effects size has on survival. The fish augmentation program has continued the PIT tagging of RASU greater than 300 mm TL for release into Reach 3, and a total of 10,551 were released this past year. Monitoring of the Reach 3 population of RASU relative to differential survival was initiated. Monitoring is conducted using electro-fishing and trammel netting during annual multi-agency surveys, as well as contacts resulting from other work task, such as C45.

To date 488 fish have been captured and met the requirements for being included in the analysis for the differential survival. Further analysis of the 488 captured razorbacks showed relative capture probabilities for each four size classes (< 300 mm, 300-349 mm, 350-399 mm, and ≥400 mm) that ranged from of 1.35, 1.29, 2.84, and 3.07 percent, from smallest to largest. These capture probabilities were significant between all size classes. This illustrates a positive correlation between size at release and capture probability, which is a clear indication of survival.

**FY12 Activities:** The stocking/harvesting activities listed in FY11 will be continued, along with the monitoring associated with annual multi-agency surveys. A contract was awarded in FY12 to initiate remote scanning of the numerous spawning aggregations in Reach 3. Based on results seen in Lake Mohave, it is expected that the remote sensing will increase the total number of RASU contacts and allow for greater analysis relative to differential survival.

**Proposed FY13 Activities:** The activities listed in FY12 will be continued. This will be the second year of the remote sensing contract and our efforts may shift depending on FY11 results. A final report summarizing the 5 years of work with recommendations for the program's Fish Augmentation Plan will be completed and posted to the LCR MSCP website.

**Pertinent Reports:** A report summarizing work completed through FY11 in draft and will be posted to the LCR MSCP website upon completion.