

## Work Task C8: Razorback Sucker Survival Studies

FY07 Estimates	FY07 Actual	Cumulative Accomplishment Through FY07	FY08 Approved Estimate	FY09 Proposed Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate
\$190,000	\$180,752	\$606,705	\$205,000	\$25,000	\$0	\$0

**Contact:** Tom Burke, (702) 293-8310, tburke@lc.usbr.gov

**Start Date:** FY05

**Expected Duration:** FY09

**Long-term Goal:** Assess overall effectiveness of stocking program and acquire data for adaptive management program.

**Conservation Measures:** RASU6.

**Location:** Reaches 4-5, river miles 50-175, Imperial Dam to Parker Dam.

**Purpose:** Assess survival and distribution of RASU released into the LCR.

**Connections with Other Work Tasks (past and future):** The work is connected to B5, as fish being studied are reared at Bubbling Ponds SFH. Data collected during this work are utilized in Work Task D8.

**Project Description:** Reclamation has stocked more than 90,000 RASU into the Colorado River below Parker Dam since 1997. This project is an assessment of survival, growth, and distribution of these fish. The work is being performed by ASU in cooperation with Reclamation and AGFD. The work consists mainly of netting, electro-shocking, and radio/sonic tagging and tracking of stocked fish to determine survival and distribution. Field sampling is conducted monthly from September to May (nine trips). No sampling occurs during June, July, or August, because high water temperatures exceed safe handling protocols for these fishes. Trip reports are provided to Reclamation following each of the nine sampling trips, and these are summarized into an annual report covering the calendar year (January through December).

**Previous Activities:** Reclamation was required under the 1997 BO from USFWS to rear and stock 50,000 RASU into the Colorado River downstream of Parker Dam. During ESA consultations in 2002 aimed at extending the regulatory relief of the 1997 BO, Reclamation agreed to assess the survival of released fish. This study began in 2002, prior to implementation of the LCR MSCP. Results from work accomplished in 2002-2004 are summarized in a final report on file with Reclamation. An additional requirement to stock 20,000 RASU stemmed from a 2001 BO for SIA. And during from 2005 to present, an additional 20,000 plus fish have been released, bringing the total number of RASU released below Parker Dam to more than 90,000.

Activities since 2005 are included as LCR MSCP accomplishments and reported in this document.

**FY07 Accomplishments:** Lower Colorado River survey monitoring resulted in contact with 10,941 fish representing 19 species and including 875 RASU captures. All RASU were assumed to originate as stocked fish. RASU larvae were captured in several backwaters but there was no evidence of recruitment to the juvenile stage. Among 847 different RASU handled, 500 contained PIT tags, and tags were injected into all unmarked fish. Growth of marked fish was rapid, and similar to that recorded for RASU of similar size at other locations including Lake Mohave.

In December and January, seven RASU longer than 50 cm were tagged with external radio transmitters in an attempt to locate active spawning sites. Contact was made in February with six fish outside A-7 backwater, where they were originally captured. This was the last contact despite monitoring efforts into late March.

Data indicate a population decline between spring and autumn, suggesting over-summer mortality. Actions were taken to assess three possible sources for these losses: water quality, bird predation, and fish predation. Because backwaters may have low oxygen levels, reduced dissolved oxygen may be a factor in mortality. Bi-weekly measurements were taken in A-7 and A-10 backwaters at 8-12 established stations during the summer. Readings were taken at substrate, middle, and surface depths, and sampling stations were chosen to represent a diversity of habitats. The sampling included both early morning hours when dissolved oxygen is often at its lowest point and afternoon hours when dissolved oxygen levels are typically their highest. Most dissolved oxygen values were greater than 4 ppm, but occasional near-anoxic conditions occurred near bottom. In general, each backwater always had ample areas of adequate dissolved oxygen, suggesting this factor alone is not the likely cause of summer mortality. Summer water temperature was greater than 25°C in all locations and depths, and effects may be compounded with parasitism or disease to stress fish, but again, water temperatures alone were not sufficiently high enough to have been the primary cause for over-summer mortality.

The database for fish recaptured from 2003 to 2006 showed that greater than 21% of fish handled had wounds suggesting attacks by birds. On numerous occasions field crews observed recently released RASU swimming near the surface in groups. These two observations were thought to be related (i.e. RASU swimming near the surface drew attacks from predaceous birds). It was possible that surface feeding during the rearing process may have trained the RASU to come to the surface in search of food. An investigation on surface imprinting due to surface feeding in the hatchery was initiated. Two hatchery ponds containing similar quantities and sizes of razorback sucker were fed at the surface and subsurface. Fish were fed for approximately 90 days, harvested, released into A-10 backwater in January 2007, and monitored. A second replicate was initiated in April 2007, and fed for 180 days, with stocking in October 2007. Final results and recommendations from both replicates will be available in FY08.

To assess the role of fish predators, investigations were initiated to assess the predator load in A-7 and A-10 backwaters. A mark-recapture survey for largemouth bass was performed in A-10 backwater in March and April 2007 to investigate their potential for predation on stocked RASU.

A population estimate was 459 (95% CI 205-1,147), and few fish were greater than 40 cm long. While exceptionally large largemouth bass specimens may impact smaller RASU, this seems unlikely in A-10 backwater.

Attempts were also made to assess flathead catfish numbers in these areas. An insufficient number of flathead catfish was captured to support population estimation. This result is consistent with regular monitoring efforts, which suggest few flathead catfish occupy A-10 backwater.

Dispersal of fish from A-10 via the downstream culvert pipe was continuously monitored with a remote PIT antenna and scanner. Few fish were recorded exiting the backwater despite much nearby spawning activity in spring 2007.

**FY08 Activities:** Routine site monitoring and associated evaluations (characterization of dispersal, abundance estimations, larval collections) will continue. Radio tags will be used to identify spawning sites, and will expand to include the Parker Strip. All sub-projects will be completed including assessment of long-term post-stocking RASU survival. A project final report will be processed not later than January 2009 (FY09), which will include an overall assessment of the success of the lower river RASU stocking program and specific recommendations to continue the program or to implement programmatic changes.

**Proposed FY09 Activities:** A project completion report will be processed, which will include an overall assessment of the success of the lower river RASU stocking program and specific recommendations to modify the program or to implement programmatic changes. Once accepted by Reclamation, 50 copies of the report will be produced and distributed. Formal oral presentation will be made by the contractor to the LCR MSCP Steering Committee or to a subgroup designated by that committee.

**Pertinent Reports:** An annual report for 2007 is under development and will be posted to the LCR MSP Web site when finalized. The annual reports for 2005 and for 2006 are already available on the Web site.