

Work Task C13: Lake Mead Razorback Sucker Study

FY10 Estimates	FY10 Actual	Cumulative Accomplishment Through FY10	FY11 Approved Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate
\$300,000	\$341,670.90	\$1,305,050.53	\$125,000	\$125,000	\$125,000	\$125,000

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Start Date: FY05

Expected Duration: FY15

Long-term Goal: Determine conditions that allow for natural recruitment of RASU.

Conservation Measures: RASU7.

Location: Reach 1, Lake Mead, Nevada/Arizona.

Purpose: Assess RASU population and recruitment in Lake Mead.

Connections with Other Work Tasks (past and future): This work task was previously included in the Draft FY05 Work Tasks as Lake Mead Razorback Study (D7). Larvae collected during this effort are to be reared at Lake Mead Hatchery (B6) and Overton WMA (B11).

Project Description: The LCR MSCP will continue to fund and support the ongoing studies of RASU in Lake Mead that were implemented under the SIA BO. The focus areas of these studies are to:

1. Locate populations of RASU in Lake Mead.
2. Document use and availability of spawning areas at various water elevations.
3. Monitor potential nursery areas.
4. Continue aging of captured RASU.
5. Confirm recruitment events that may be tied to physical conditions in the lake.

These studies began in 1995 and were anticipated to be completed within a 5-10 year period. However, under Conservation Measure RASU7, these studies may be followed by further research and monitoring within the adaptive management program of the LCR MSCP.

Previous Activities: The SNWA began a monitoring program for RASU in Lake Mead in 1995, partnering with NDOW and Reclamation. Between 1995 and 2004, some 200 adult and 30 juvenile RASU were captured. Aging data showed that a low level of recruitment has occurred in at least 22 of the past 30 years. This remarkable recruitment

has happened in the face of extensive non-native fish populations and declining lake elevations. A summary report of the first 10 years of the study was completed and posted to the LCR MSCP website.

FY10 Accomplishments: Trammel netting surveys during the spawning season resulted in the capture of 58 RASU, 13 from Echo Bay, 20 from Las Vegas Bay, and 25 from the Muddy River/Virgin River inflow area. Six of the RASU collected were subadult fish, and 12 were recaptures. Aging information was obtained from 48 RASU during the 2010 study year, and evaluation of fin-ray sections removed from captured fish suggests continued, recent recruitment in Lake Mead. Growth information was also obtained from a subset of recaptured fish, and mean growth rates of Lake Mead RASU continue to be substantially higher than those recorded from other populations. This elevated rate of growth and the continued presence of subadult fish suggest that the Lake Mead RASU populations are able to maintain a fairly strong cohort of young, fast growing fish. Seven hundred and sixty-two larval RASU were also captured during the 2010 spawning season. Larvae were present in all three of the main study areas with 601 captured from Echo Bay, 145 from Las Vegas Bay, and 16 from the Muddy River/Virgin River inflow area. All larvae were subsequently delivered to the Lake Mead SFH for grow-out (B6). Monitoring of sonic-tagged fish continued to gather information on habitat use and movement patterns of RASU. Data obtained from monitoring sonic-tagged fish provided valuable information including the general location of the RASU population, the location of spawning sites, and the movement patterns of RASU within and between spawning areas. An additional point of interest from the 2010 study season was the capture of 6 flannelmouth sucker from the Muddy River/Virgin River inflow area. All flannelmouth were marked with PIT tags, and fin-ray sections were removed for aging purposes. This is the first year flannelmouth have been documented through these monitoring efforts.

A cooperative research study was initiated by Reclamation and the Glen Canyon Adaptive Management Program to evaluate razorback sucker use of the Colorado River inflow (CRI) area of Lake Mead. Based on research conducted during the long-term Lake Mead monitoring study, 8 pond-reared razorback suckers were sonic tagged and released into Gregg Basin and the CRI. Sonic tagged fish were tracked to determine potential spawning locations in this area of the lake, and trammel netting and larval sampling were used when suspected spawning sites had been identified. Trammel netting surveys conducted during the spawning season resulted in the capture of three wild, adult RASU, and larval sampling resulted in the capture of seven larvae. Additional efforts will be performed in subsequent years to gather more information on the use of the CRI area by native fish.

FY11 Activities: Monitoring of RASU ecology in Lake Mead will continue. However this work has been separated from the research task and has been reassigned to an existing work task under the System Monitoring portion of the LCR MSCP (D8).

All RASU research actions initiated in the CRI area of Lake Mead are expected to continue. These actions will include larval sampling, adult trammel netting, monitoring of sonic-tagged fish, evaluating growth rates of recaptured fish, and fin-ray sectioning for

aging subadult and adult RASU. In light of the results from the FY10 study year, sampling efforts will be doubled to increase the opportunity of contacting various life stages of RASU in the area. Data obtained through these actions will help identify the size, age structure, habitat use, spawning areas, and recruitment patterns of the RASU aggregate located in the CRI.

Proposed FY12 Activities: Investigations will continue in the Colorado River inflow area of Lake Mead. Additional changes to the study design will be made as necessary based on the results from the first two study years. An additional group of smaller size class RASU may also be implanted with sonic tags to begin evaluating movement patterns and habitat use of subadult fish.

Pertinent Reports: *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 2009-2010 Final Annual Report*, and *Razorback Sucker Investigations at the Colorado River Inflow Area Lake Mead, Nevada and Arizona 2010 Final Annual Report* will be posted to the LCR MSCP website. The 10-year comprehensive report, *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 1996-2007*, is available on the LCR MSCP website.