

Work Task D8: Razorback Sucker and Bonytail Stock Assessment

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
\$575,000	\$624,518.66	\$3,433,712.00	\$675,000	\$675,000	\$675,000	\$675,000

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Start Date: FY05

Expected Duration: FY55

Long-term Goal: Conduct long-term system monitoring of RASU and BONY

Conservation Measures: RASU6 and BONY5

Location: Lower Colorado River within the LCR MSCP planning area, including reservoirs and connected channels, from Lake Mead downstream to Imperial Dam.

Purpose: Supplement and maintain sufficient knowledge and understanding of RASU and BONY populations within the LCR MSCP planning area to have an effective AMP.

Connections with Other Work Tasks (past and future): Monitoring data for RASU and BONY have been or will be gleaned from work accomplished under C8, C12, C13, C15, F5, and G3.

Project Description: This project collects and organizes RASU and BONY population and distribution data to maintain up-to-date, system-wide, stock assessments for these species. Data acquisition work is accomplished by one of two strategies: 1) gleaned information from ongoing fish monitoring and fish research activities, and 2) direct data collection through field surveys within the LCR MSCP planning area not covered by other work tasks.

Work routinely includes trammel netting and electro-fishing, but visual surveys using Reclamation's helicopter are periodically conducted, as well as surveys using specialized equipment and techniques (e.g., aerial and underwater photography and video recordings). Costs described under this work task are for salary, travel, and materials necessary for Reclamation staff to accomplish this work. Project costs include all costs associated with conducting field surveys, gleaned or capturing data from ongoing research actions and monitoring programs (both internal and external to the LCR MSCP), transfer of these data into record archives, and organizing these data into a cohesive report.

Previous Activities: Reclamation has cooperatively conducted fish surveys with Nevada and Arizona on Lake Mead each fall since 1999, and has provided funding and support to the Lake Mead Razorback Study (C13) since 1995. Interagency cooperative native fish roundups have been occurring since 1987 on Lake Mohave and since 1999 on Lake Havasu (including the river reach below Davis Dam). Fish monitoring in Reach 2 was previously conducted under Demographics and Post-Stocking Survival of Repatriated Razorback Suckers in Lake Mohave (C12), which ended in 2011. Fish monitoring on Reaches 4 and 5 was previously conducted as part of the Razorback Sucker Survival Study (C8), which ended in 2008.

FY12 Accomplishments: Accomplishments for this work task have been summarized by river reach.

Reach 1 (Lake Mead). Reclamation, in cooperation with the AGFD, NDOW, and NPS, conducted annual fall surveys of Lake Mead. Participating agencies were responsible for sampling Boulder Basin, Virgin Basin, Gregg Basin, and the Overton Arm. Techniques employed in this lake wide effort included gill netting and electro-fishing and resulted in the capture of over 1,500 fish including 13 different species. Two species of native fish were captured during this effort including 3 RASU and 4 FLSU. Of the three RASU contacted, two were new captures and one was a recapture.

Collection of wild-born RASU larvae took place at all major spawning sites (Las Vegas Bay, Echo Bay, and the Muddy River/Virgin River inflow) over the course of the spawning season. This effort yielded 274 larvae from Las Vegas Bay, 439 larvae from Echo Bay, and 4 larvae from the Muddy River/Virgin River inflow area for a lake wide total of 717 larvae. Approximately 400 larvae were subsequently delivered to the Lake Mead State Fish Hatchery (B6) for rearing. An additional 75 were retained for genetic analyses with the remaining being returned to the lake.

Monitoring of the Lake Mead RASU population also continued. Tracking of sonic-tagged fish continued to gather information on habitat use and movement patterns of RASU, and data obtained from monitoring sonic-tagged fish provided valuable information including the general location of RASU populations, the location of spawning sites, and the movement patterns of RASU within and between spawning areas. Trammel netting surveys conducted during the spawning season resulted in the capture of 53 total RASU, with 18 coming from Echo Bay, 2 from Las Vegas Bay, and 33 from the Muddy River/Virgin River inflow area. Of the 53 RASU captured, 20 were recaptured fish. The remaining 33 captured RASU were new wild fish captured in the Muddy River/Virgin River inflow area. Aging information was obtained from 35 RASU during the 2012 study year bringing the total number of RASU aged as part of the long-term monitoring program to 395. The evaluation of fin-ray sections removed from captured fish continues to suggest ongoing and recent recruitment in Lake Mead.

A pilot sonic telemetry study to monitor the movement and habitat preference of juvenile RASU was also initiated in FY12 as part of this work task, which was responsible for the increase in funding. A total of 4 juvenile fish were implanted with sonic tags and tracked

through the study year. When fish were located, information regarding water quality, substrate composition, and vegetation was collected. This study will continue under a separate work task in FY13 (Work Task C57) with the goal of identifying what conditions may be allowing for natural recruitment of RASU in Lake Mead.

Reach 2 (Lake Mohave). Reclamation successfully repatriated 12,793 RASU into Lake Mohave in calendar year 2012. This is an increase from the number of RASU stocked in 2011 (7,687) and above the targeted 6,000.

Following the completion of Work Task C12, monitoring of Reach 2 is now accomplished through a contract which resulted in an increase in funding during FY12. Lake-wide surveys for native fish were conducted using both trammel netting (44 net nights, 47 RASU contacted) and electro-fishing (274 seconds, 12 RASU contacted) techniques. Remote sensing was expanded in 2011 to include the lotic portion of Lake Mohave upstream of Willow Beach. New advances in remote PIT tag antennae design allowed for sampling in the high flow conditions of that reach, thereby contacting a significant number of RASU that had been previously undetected through other sampling methodology.

In 2012, a total of 46,855 remote sensing contacts were recorded lake-wide (9,241 for 2011) with 19,813 (3,134 in 2011) representing 1934 (730 in 2011) RASU coming from the reach above Willow Beach with an effort of 4397 hours of scan time (1,987 hours in 2011) and 27,042 (6,107 in 2011) contacts representing 854 RASU (321 in 2011) with an effort of 3996 hours of scan time (1,275.5 hours in 2011) throughout the rest of Lake Mohave for a total of 2,748 individual RASU contacted with 8,393 hours of scan time compared with 1,044 individual RASU in 3,262.5 hours in 2011. 40 RASU were contacted in both the lentic and lotic sections of the lake compared with 7 for 2011.

Netting and electro-fishing contact data were analyzed under Demographics and Post-Stocking Survival of Repatriated Razorback Suckers in Lake Mohave (C12) resulting in the current population estimate of 2,577 adult RASU, compared with the population estimate for 2011 of 2,979 adult RASU and 1,463 adult RASU for 2010.

Annual RASU (May and November) roundups were conducted. Bimonthly helicopter surveys were conducted to verify presence of RASU on known spawning beds and to search for new spawning congregations during the spawning season. A total of 25,003 RASU larvae were collected and delivered to Willow Beach National Fish Hatchery (B2) for rearing.

Reach 3 (Lake Havasu). A total of 7,683 RASU and 4,000 BONY were released into Reach3 during calendar year 2012, all fish were released with a PIT tag.

Capture/contact data was acquired through work task C33, C39, C45, C53, F5, ongoing multi-agency native fish roundups, and from other annual surveys conducted by LCR MSCP partners. A fall netting survey was conducted through Topock Gorge to look for young native fishes, a total of 111 RASU and 13 BONY were collected. A total of 42

RASU and 0 BONY were contacted during the annual Lake Havasu roundup. Captures of BONY from annual surveys is down this year, compared to the unusually high numbers of FY11. Large numbers of RASU continue to be contacted in the riverine portions near Needles and select backwaters throughout Topock Gorge. Gizzard shad continue to become more abundant and are present in all portions of Reach 3. The remainder of the non-native fish community did not show any significant changes.

The combination of remote PIT scanning and regular sampling methodologies totaled 1,006 razorback contacts in 2012, this is over a 3 fold increase from previous years. This is due to the increase in remote PIT tag scanning associated with work task C33. This increase in contacts resulted in a population estimate of 2,770 individuals, this is nearly double the 2011 estimate of 1,400 RASU. The RASU population estimate continues to be refined as survey methods and the analysis are improved. In general, this population has maintained an upward trend and has more than doubled since the beginning of the MSCP.

Reach 4 and 5 (Parker Dam to Imperial Dam). Under the Fish Augmentation Program, 6,629 RASU and 3,821 BONY were stocked into Reach 4. All 6,629 RASU were stocked into the LCR between Parker Dam and Headgate Rock Dam. A total of 3,216 BONY were stocked between Parker Dam and Headgate Rock Dam, and 605 BONY were stocked at Deer Island and Moovalya Marsh on the Colorado River Indian Tribe (CRIT).

An agreement was finalized with the USFWS under Investigations of RASU and BONY Movements and Habitat Use Downstream of Parker Dam (C49), which includes an MOU with the CRIT for stocking and monitoring of native fish on CRIT lands. Field work associated with this work task is scheduled to begin in FY13. Preliminary monitoring continues to contact BONY shortly following their release, as well as a small population of RASU which are assumed to be spawning downstream of Parker Dam.

In Reach 4 a total of six RASU were contacted in Palo Verde Oxbow Lake from previous year's stockings. The numbers contacted are too low to generate a population estimate for this reach. In Reach 5 remote PIT scanners were used to monitor population size and habitat association of BONY and RASU at Imperial Wildlife Refuge. Adult BONY population estimates ranged from 53 (March 2012) to 11 (August 2012). Adult RASU population estimates ranged from 131 (January 2012) to 103 (August 2012). No larval BONY or RASU were encountered, but juvenile RASU were captured and the population of new recruits was estimated at 130 fish.

FY13 Activities: Monitoring data will be collected for Reaches 1 through 5. Information will be gleaned from ongoing fish research activities as well as through fish monitoring field work. Field work will include trammel netting, electro-fishing, remote sensing of PIT-tagged fish, and active and passive tracking of sonic-tagged fish.

Proposed FY14 Activities: Monitoring will continue in all reaches as previously outlined, and LCR MSCP staff will continue to participate in multi-agency field surveys.

Pertinent Reports: The *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 2011-2012 Final Annual Report*, the *2012 Lake Mohave Razorback Sucker Monitoring Annual Report*, and the *Movements of Sonic Tagged Razorback Suckers Between Davis and Parker Dams (Lake Havasu) Final Report* will be posted to the LCR MSCP website following review.