

Work Task D8: Razorback Sucker and Bonytail Stock Assessment

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
\$575,000	\$614,086.24	\$2,816,169.85	\$575,000	\$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, C23, 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) gleaning 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, gleaning 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 on reaches 4 and 5 has been conducted as part of the Razorback Sucker Survival Study (C8) which ended in 2008.

FY11 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 2,000 fish including 13 different species. No native species were captured during this effort.

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 449 larvae from Las Vegas Bay, 3,818 larvae from Echo Bay, and 21 larvae from the Muddy River/Virgin River inflow area for a lake wide total of 4,288 larvae. Larvae were subsequently delivered to Lake Mead State Fish Hatchery (B6) for rearing.

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 86 total RASU, with 15 coming from Echo Bay, 9 from Las Vegas Bay, and 62 from the Muddy River/Virgin River inflow area. Five of the RASU collected were subadult fish, and 14 were recaptures. Aging information was obtained from 73 RASU during the 2011 study year, and evaluation of fin-ray sections removed from captured fish suggests continued, recent recruitment in Lake Mead.

The second year of monitoring in the Colorado River inflow (CRI) area of Lake Mead was also completed in FY11. Using sonic-tagged RASU to locate potential spawning sites, larval sampling was conducted on 39 nights and resulted in the capture of 65 larval RASU and 11 larval FLSU. Trammel netting was used to capture adults where concentrations of RASU were suspected, and fin ray specimens were obtained from appropriate adult RASU for aging purposes. From 187 net-nights, 9 wild RASU, 7 RASU × FLSU hybrids, and 112 FLSU were captured. Of these fish, 2 RASU, 1 hybrid, and 39 FLSU were recaptures from 2010. Three of the wild RASU were males expressing milt; the other six were females showing signs of spawning, which helped confirm spawning activities. Ages from the seven new wild RASU ranged from 6–11 years.

Reach 2 (Lake Mohave). Reclamation successfully repatriated 7,687 RASU into Lake Mohave in calendar year 2011. This is a slight decrease from the number of RASU stocked in 2010 (9,203), but still well above the targeted 6,000.

Lake-wide surveys for native fish were conducted using both trammel netting (43 net nights, 41 RASU contacted) and electro-fishing (6,640 seconds, 87 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. A total of 9,241 remote sensing contacts were recorded lake-wide with 3,134 contacts representing 730 RASU coming from the reach above Willow Beach (1,987 hours of scan time) and 6,107 contacts representing 321 RASU (1,275.5 hours of scan time) throughout the rest of Lake Mohave for a total of 1,044 individual RASU contacted (7 RASU were contacted in both the lentic and lotic sections of the lake). 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 2,979 adult RASU compared with the population estimate for 2010 of 1,463 adult RASU.

Annual RASU (May and November) and BONY (May) 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 25,018 RASU larvae were collected and delivered to Willow Beach National Fish Hatchery (B2) for rearing.

Reach 3 (Lake Havasu). A total of 10,551 RASU and 4,380 BONY were released into Reach 3 during calendar year 2011, all of the fish were released with a PIT tag. The PIT tagging of BONY is new this year and is a result of the increase in BONY captures during annual surveys.

Reclamation participated in the ongoing multi-agency native fish roundup, and collected data from other annual surveys conducted by LCR MSCP partners. A fall netting/electrofishing survey was conducted through Topock Gorge to look for young native fishes, a total of 68 RASU were collected. A total of 124 RASU and 68 BONY were contacted during the annual Lake Havasu roundup. In the past BONY captures from annual surveys have been less than ten. All but one of the BONY were captured near the Bill Williams Refuge and fisherman continue to report accidental BONY captures in this same area. Large numbers of RASU continue to be contacted in the riverine portions and Park Moabi of Reach 3. Younger, recently released RASU dominate the trammel net catch from the backwaters within the reach, while more mature RASU are contacted during electro fishing surveys of the numerous spawning aggregations. This is the first year gizzard shad were present in the annual surveys; the majority of these were captured near the Bill Williams River delta. The remainder of the non-native fish community did not show any significant changes.

The RASU population estimate was refined in an effort to meet the necessary assumptions of the modified Peterson method. The annual single-census population estimate was determined for repatriated razorback suckers by applying census data gathered between January and March in consecutive years (FY10 and FY11). A population estimate of 1,400 RASU was generated. This estimate is substantially lower than previously reported estimates (FY09 = 4,376), but this decrease is a direct result of refining our methods and is not an indication of a decrease in abundance. These refined methods were applied to previous years data and those estimates were

also substantially lower (FY09 = 1,008). In general this population has maintained an upward trend, and has more than doubled in the past 5 years.

Reach 4 and 5 (Parker Dam to Imperial Dam). Under the Fish Augmentation Program, 7,360 RASU and 2,742 BONY were stocked into Reach 4. A total of 6,303 RASU were stocked into the LCR between Parker Dam and Headgate Rock Dam, 550 RASU were stocked into High Levee Pond, and 507 RASU were stocked into Palo Verde Oxbow Lake. All BONY were stocked into the LCR between Parker Dam and Headgate Rock Dam.

A permit for sampling within the Colorado River Indian Tribes Reservation (CRIT) on Reach 4 was obtained in November. Field sampling of fish within Reach 4 was limited due to the 1 year delay associated with the start of Work Task C49. However, the USFWS was able to conduct some cursory investigations which included parts of the CRIT. These investigations resulted in the collection of numerous BONY shortly following their release, as well as a small population of RASU which are assumed to be spawning downstream of Parker Dam. All fisheries surveys in Reach 5 were restricted to Imperial Ponds Native Fish Research (C25).

FY12 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 FY13 Activities: Monitoring will continue in all reaches as previously outlined, and LCR MSCP staff will continue to participate in multi-agency field surveys. The funding increase beginning in FY13 will support monitoring efforts in Lake Mohave which were previously covered under Demographics and Post-Stocking Survival of Repatriated Razorback Sucker in Lake Mohave (C12).

Pertinent Reports: The *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 2010-2011 Final Annual Report*, the *Razorback Sucker Investigations at the Colorado River Inflow Area Lake Mead, Nevada and Arizona 2011 Final Annual Report*, the *Demographics and Post-Stocking Survival of Repatriated Razorback Sucker in Lake Mohave Final Report*, and the *Movements of Sonic Tagged Razorback Suckers Between Davis and Parker Dams (Lake Havasu) Final Report* are available upon request and will be posted to the LCR MSCP website.