

Work Task D8: Razorback Sucker and Bonytail Stock Assessment

| FY09 Estimates | FY09 Actual | Cumulative Accomplishment Through FY09 | FY10 Approved Estimate | FY11 Proposed Estimate | FY12 Proposed Estimate | FY13 Proposed Estimate |
|----------------|--------------|--|------------------------|------------------------|------------------------|------------------------|
| \$350,000 | \$469,412.71 | \$1,614,377.31 | \$400,000 | \$575,000 | \$600,000 | \$650,000 |

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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) 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.

Under the first strategy, LCR MSCP staff will gather and organize data from existing monitoring programs. For example, sport-fish surveys and native-fish surveys are conducted annually on lakes Mead, Mohave, and Havasu by multi-agency teams, with LCR MSCP fishery staff participating in each survey. In each survey, the lake is divided into different zones with one survey group assigned to each zone. All zones are sampled within a set time period using similar equipment. When the survey is complete, each participating agency receives information for the entire lake at a reduced cost incurred by only needing to survey a portion of the whole system.

Also under the first strategy, data will be gleaned from ongoing species research actions. For example, a RASU study is being conducted on Lake Mead (C13) and another study is being conducted in the lower river below Parker Dam (C8). Data for RASU population status and distribution will be gathered from these studies.

Under the second strategy, areas not being sufficiently surveyed through ongoing activities will be surveyed either by LCR MSCP fishery staff or another entity. For example, the current surveys for RASU between Davis and Parker dams are being conducted jointly by USGS and Reclamation and are financially supported through D8. Another major monitoring action funded by this work task is the survey work conducted on Lake Mohave to assess survival and distribution of repatriated RASU. Areas along the lower two-thirds of the lake are netted monthly between October and May. The upper third of the lake, including the area above Willow Beach and up to Hoover Dam, are electro-fished and netted during the June to September period (due to cool water releases from Lake Mead).

In some cases, LCR MSCP fishery staff conduct native fish surveys to fill in seasonal gaps left by other research activities. For example, USGS surveys for RASU between Davis Dam and Lake Havasu are only conducted during the January to April spawning period. Staff from the LCR MSCP monitor sonic-tagged fish in this reach during the summer and conduct electro-fishing in the fall to provide a more complete assessment of the fishery.

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).

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 by Reclamation and ASU as part of the Razorback Sucker Survival Study (C8) annually since 2003. Reclamation financially supports the Colorado River Fishes database maintained by ASU through G1.

FY09 Accomplishments: Accomplishments for this work task are summarized by river reach:

Reach 1 (Lake Mead). Reclamation, in cooperation with the AZGFD and NDOW, 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 lakewide effort included gill netting and electro-fishing and resulted in the capture of 10 different species, including four RASU.

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 1,497 larvae from Las Vegas Bay, 7 larvae from Echo Bay, and 50 larvae from the Muddy River/Virgin River inflow area for a lakewide total of 1,554 larvae. Larvae were subsequently delivered to Lake Mead State Fish Hatchery for rearing (B6).

Species monitoring of the Lake Mead RASU population (C13) also continued. During December 2008, 12 adult RASU were sonic-tagged and released into Lake Mead near the three major spawning locations (4 fish at each location). In addition to these 12 fish, 5 sonic-tagged RASU also remained from a previous tagging event. These fish were tracked using sonic telemetry, and information on movement patterns, habitat use, and ultimately the location of spawning aggregates was obtained. This information allowed researchers to deploy trammel nets more efficiently and resulted in capturing a total of 80 RASU, including 35 subadult fish. Capture data, along with aging and growth data obtained during this study year, have once again indicated continued, successful recruitment in Lake Mead.

Reach 2 (Lake Mohave). Reclamation repatriated 12,496 RASU into Lake Mohave in 2009. This stocking effort marks the return to stocking RASU that have achieved a minimum size of 300 mm TL as established by the MSCP. This is a significant increase in the number of RASU stocked in 2008 (771), indicative of availability of the largest RASU obtainable (overall average of 456 mm TL) from all sources in 2008. Lake-wide surveys for native fish were conducted, including trammel netting (62 net nights, 27 RASU contacted), electro-fishing (5,546 seconds, 75 RASU contacted), and remote sensing (for a more detailed overview see C23), which resulted in 3,083 total PIT-tag (RASU) contacts from 1,049 hours of deployment time representing 191 RASU contacted. All native fish contact data were provided to Marsh & Associates LLC (formerly ASU Native Fish Lab) for analysis and were used to derive the current population estimate of 1,579 adult RASU (C12). Reclamation also assisted with stocking and tracking sonic-tagged RASU.

Annual RASU (May and November) and BONY (May) roundups were conducted. The LCR MSCP partners and cooperators for these efforts included USFWS, AGFD, NDOW, ASU (Marsh & Associates LLC), and NPS. 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 27,512 RASU larvae were collected and delivered to Willow Beach NFH for rearing (B2).

Reach 3 (Davis Dam to Parker Dam or Lake Havasu). Under the Fish Augmentation Program, 5,848 RASU and 4,073 BONY were stocked into Reach 3 during calendar year 2009.

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 by Reclamation through Topock Gorge to look for young-of-year native fishes. Large numbers of RASU continue to be contacted in the riverine portions of Reach 3 (>280 RASU). Younger, recently released RASU dominate the catch from the numerous backwaters within the reach, while more mature RASU are contacted during surveys of the numerous spawning aggregations. A limited number of BONY contacts were made during the 2009 survey year. Sixteen BONY were contacted near the Bill Williams River inflow by USFWS personnel; all of these BONY were recently stocked fish. The non-native fish community did not show any significant changes and was represented by 15 different species.

A population estimate of 1,201 adult fish was generated as a result of the RASU aging work, which was initiated in 2008 under G3 and was captured by C29 in 2009. The previous estimate was higher (1,659 fish), but still falls within this year's range. Estimates are expected to stabilize as this population continues to be monitored.

Reclamation conducted eight trips to monitor movements of sonic-tagged razorback suckers between Davis and Parker dams in 2009. BLM searched Lake Havasu on two additional occasions. No additional mortality was observed in the fish originally sonic tagged at the Needles and Laughlin spawning sites. As in 2007, all of these fish had returned to the spawning sites where they were originally captured by December 2008. They remained at the spawning sites until mid-March. From March until late summer/early fall, these fish continued to use the same locations that they utilized outside the spawning season in previous years. By the end of July some had returned to their spawning sites and all had returned by December. This was very similar to 2007. The one remaining razorback sucker released at Cattail Cove in January 2008 was also detected numerous times at the Needles spawning site. Outside of the spawning season, this fish was detected upstream of Needles on two occasions.

Five sonic-tagged male razorback suckers were released at Standard Wash in December 2008. The purpose of this release was to look for spawning sites being used by razorback suckers in Lake Havasu. Two of these fish had joined the spawning group at Needles by early February. The other three fish appeared to have died within two months of their release. These fish had remained in the lower end of the reservoir between Cattail Cove and Bill Williams Delta.

The fourth field season of FLSU surveys associated with C15 was completed. Data were collected using numerous techniques. The 2009 field season remained focused on the distribution and abundance of young-of-year FLSU, with additional emphasis on increasing adult contacts via electrofishing, which will facilitate a more robust population estimate.

Reaches 4 and 5 (Parker Dam to Imperial Dam). During calendar year 2009, Reclamation stocked 5,757 RASU and 2,506 BONY into Reach 4 (between Parker and Headgate Rock dams), and 198 RASU were stocked into Imperial Ponds (C25) Reach 5. Field sampling of fish within the confines of the Colorado River Indian Tribes Reservation (CRIT) on Reach 4 was not initiated due to permitting issues. However, multiple ocular surveys were conducted in Reach 4. A winter survey focused from Parker Dam to Headgate Rock Dam located a small group of RASU in the main channel downstream of River Island State Park. A summer survey was also conducted for all of Reach 4; no native fish were identified. There were no surveys conducted in the river portions of Reach 5 due to poor survival estimates, which have been documented in C8. All fisheries surveys in Reach 5 were restricted to Imperial Ponds (C25).

An interagency acquisition was initiated between Reclamation and the USFWS to allow for greater cooperation and assistance along the river in reaches 3, 4, and 5. The USFWS has an established working relationship with CRIT and it is expected that this relationship should facilitate the expansion of native fish work into the CRIT boundaries.

FY10 Activities: Monitoring will continue in all reaches. Monitoring activities are summarized by river reach:

Reach 1. Representatives from Reclamation, AZGFD, NDOW, and NPS will collaborate to perform annual fall surveys of Lake Mead. RASU larval collections will be conducted at all major spawning sites, and captured larvae will be transported to Lake Mead SFH for grow out (B6). Species research will continue on the Lake Mead RASU population (C13) with efforts focused on trammel netting adult and subadult RASU during the spawning season, acquiring age and growth data from recaptured RASU, and monitoring sonic-tagged RASU to identify movement patterns, habitat use, and shifts in RASU spawning site locations. Population dynamics will be assessed through analysis of year-end data sets.

Reach 2. Monitoring will continue with effort similar to 2009. Lake-wide surveys for native fish will continue to include trammel netting, electro-fishing, and remote sensing. A RASU larval collection goal of approximately 25,000 with an additional goal of approximately 2,500 for Lake Mead as needed has been established. Sonic tracking of native fishes in Reach 2 will continue. Use of remote sensing equipment for PIT-tag detection (C23) will be incorporated into routine monitoring actions. LCR MSCP staff will continue to participate in multi-agency field surveys. Increased visual surveys will be conducted below Hoover Dam in search of spawning aggregations of native fishes released through the Fish Augmentation Program.

Reach 3. Monitoring will continue with effort similar to 2009. There will be an increase in effort relative to the BONY as a result of C39.

Reach 4/5. Monitoring will be expanded to include netting and electrofishing. A statement of proposed activities will be presented to the CRIT in an effort to gain permission to conduct native fish surveys on their lands.

Proposed FY11 Activities: System monitoring work to be performed on Reach 1 is described in the report, *Lake Mead Razorback Sucker Monitoring Recommendations*, available on the LCR MSCP Web site. Monitoring activities for RASU previously conducted under research C13 are being relocated to this work task. The funding increase for FY11 reflects this change. Monitoring data will be collected for reaches 2 through 5. Sonic tracking of adult RASU in Reach 3 will be completed. LCR MSCP staff will continue to participate in multi-agency field surveys. Increased visual surveys will be conducted below Hoover Dam, Davis Dam, Parker Dam, Headgate Rock Dam, and Palo Verde Diversion Dam in search of spawning aggregations of native fishes released through the Fish Augmentation Program.

Pertinent Reports: *Lake Mead Razorback Sucker Monitoring Recommendations* is available on the LCR MSCP Web site.