

## Work Task D8: Razorback Sucker and Bonytail Stock Assessment

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$300,000	\$339,719.60	\$1,144,964.60	\$350,000	\$400,000	\$450,000	\$450,000

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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 are 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 hired via contract, grant, or agreement. 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 by Reclamation 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 conducts 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 other 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. In cases where Reclamation staff assist contractors or researchers, or conduct work in similar areas or at similar times, Reclamation's presence allows for improved quantity and quality of observations (i.e., additional effort, additional spatial coverage, additional temporal coverage). 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.

**FY08 Accomplishments:** Accomplishments for this work task have been summarized by river reach.

**Reach 1 (Lake Mead).** Reclamation, in cooperation with AGFD and NDOW, participated in annual fall surveys of Lake Mead. Techniques employed in this lakewide effort included gill netting (145.3 net nights) and electro-fishing (12,802 seconds), and resulted in the capture of three RASU. Collections of larval RASU took place at all major spawning sites over the course of the spawning season and yielded a total of 2,027 larvae. Larvae were subsequently delivered

to Lake Mead SFH for rearing (B6). Species research on the Lake Mead RASU population (C13) also continued. A total of 72 RASU including 27 subadult fish were contacted through this effort via trammel netting. Capture data, in concert with aging and growth data, have once again indicated continued, successful recruitment in Lake Mead.

**Reach 2 (Lake Mohave).** Reclamation repatriated 771 RASU and 57 BONY into Lake Mohave in 2008. The relatively low numbers of RASU stocked is indicative of availability of the largest RASU obtainable (overall average of 456mm TL) from all sources.

Lake-wide surveys for native fish were conducted, including trammel netting (75 net nights, 64 RASU contacted), electro-fishing (6568 secs, 40 RASU contacted), and remote sensing (for a more detailed overview see work task C23), which resulted in 1731 total PIT tag (RASU) contacts from 1400 hrs of deployment time representing 167 RASU contacted. All native fish contact data were provided to Marsh & Associates LLC (formerly ASU Native Fish Lab) for analysis and used to derive the current population estimate of 1279 adult RASU (C12). Reclamation also assisted with stocking and tracking sonic-tagged RASU for the third year of a Marsh & Associates LLC telemetry study.

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 29,768 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, 9,536 RASU and 4,594 BONY were stocked into Reach 3 during calendar year 2008. This exceeds the annual targets for both species, (6,000 RASU and 4,000 BONY).

Reclamation participated in the ongoing multi-agency native fish round-up, and collected data from spring and fall electrofishing surveys by LCR MSCP partners. A fall netting/electrofishing survey was conducted by Reclamation through Topock Gorge to look for young-of-year native fishes. During this last survey, 51 adult RASU were contacted, this is an increase over the 33 from the previous years fall survey. The majority of the RASU catch was comprised of young PIT tagged fish which originated from multiple years of stocking as part of the LCR MSCP fish augmentation program.

A population estimate was generated as a result of the RASU aging work which was initiated in 2008 under work task G3. The current estimate is 1659 fish. This was based on 299 marked fish from our 2007 effort, 93 unique fish caught during the 2008 census, and 16 recaptured fish also contacted in 2007. This was the first noticeable increase for this population. This can be attributed to the MSCP fish augmentation program. Only a few smaller adult males were collected during this effort; this estimate should continue to increase as stocked fish mature and enter the spawning population.

Reclamation conducted 10 trips to monitor movements of sonic tagged razorback suckers between Davis and Parker dams in 2008. BLM and USFWS searched Lake Havasu on three additional occasions. No mortality was observed in the 2006 sonic tagged fish that were alive at the beginning of 2008. All of these fish had return to the spawning sites where they were originally captured by December, 2007. They remained at the spawning sites until late March. After March these fish returned to the same locations that they utilized outside the spawning season in 2007 where they remained throughout the summer. By the end of August some had returned to their spawning sites and all had returned by December, 2008.

Reclamation also released five sonic tagged male razorback suckers at Cattail Cove in January, 2008. The purpose of this release was to look for spawning sites being used by razorback suckers in Lake Havasu. One of these fish had joined the spawning group at Needles by February. This fish appeared to spend the summer and fall in the river or backwaters between Topock Gorge and the Lake Havasu delta, although there were no manual contacts with this fish during the summer. Another fish spent most of the spawning season near the Mesquite Bays at the upper end of Lake Havasu. After the spawning season, this fish worked its way downstream to the Bill Williams River. This fish appears to have died during the summer of 2008. Two other fish appear to have died within 2 months of their release. These fish had moved downstream from Cattail Cove to the Bill Williams River delta.

The third field season of FLSU surveys associated with C15 was completed. Data were collected using snorkel surveys, seines, trammel nets, hoop nets, electrofishing and dipnets/light trapping. The 2008 field season was focused on the distribution and abundance of young-of-year FLSU. No population estimate was calculated due to the limited number of adult contacts in 2008.

The limited number of BONY contacts for the year were recently stocked fish, thus not allowing for the generation of a population estimate. The nonnative fish community did not show any significant changes and was represented by 15 different species.

**Reaches 4 and 5 (Parker Dam to Imperial Dam).** Reclamation and ASU conducted fish surveys from Parker Dam to Imperial Dam, with the exception of CRIT Reservation (C8). Surveys included a suite of standard fishery techniques. Approximately 24,000 seconds of electro-fishing resulted in capture of 179 RASU and 3 BONY. Trammel netting effort of 1,088 net-hours resulted in 462 RASU and 13 BONY captured. Studies were conducted to determine possible effects of RASU that imprint on surface feeding and remain near the surface after stocking. Quantification of fish depth at capture indicated a shift from pelagic to demersal swimming within 100 days post-release, a behavioral change that may reduce avian predation. Despite this, estimated annual survivorship was less than 30% for stocked RASU and long-term survival is non-existent. The stocking program for the lower Colorado River below Parker Dam has not resulted in establishment of persistent populations of RASU or BONY.

During calendar year 2008, Reclamation stocked 9,067 RASU and 535 BONY into Reach 4 and 60 RASU were stocked into Imperial Ponds (C25) Reach 5. Field sampling of fish with the confines of the Colorado River Indian Tribes Reservation on Reach 4 was not initiated as had been planned due to permitting issues. However, an aerial survey was conducted using Reclamation's helicopter during March. No spawning aggregations of fish were observed.

**FY09 Activities:** Monitoring will be expanded in FY09 to include reaches 4 and 5.

**Reach 1.** Reclamation, in cooperation with AGFD and NDOW, will participate in annual fall surveys of Lake Mead. RASU larval collections will be conducted at all major spawning sites. Species research will continue on the Lake Mead RASU population (C13).

**Reach 2.** Monitoring will continue with effort similar to 2008. Lake-wide surveys for native fish will continue to include trammel netting, electro-fishing, and remote sensing. A RASU larval collection goal of 25,000 with an additional goal of 2,500 for Lake Mead has been established.

**Reach 3.** Monitoring will continue with effort similar to 2008. There will be an increase in effort relative to the RASU spawning site near Needles as a result of work task C29.

Reclamation will continue to track sonic tagged fish on a monthly basis until mid summer and begin assembling a final report of findings. Reclamation will release five additional sonic tagged male razorback suckers into the lower end of Reach 3 (Standard Wash) to continue looking for spawning sites in Lake Havasu.

**Reach 4/5.** Monitoring will continue with effort similar to 2008. Field surveys will be conducted below Parker Dam.

**Proposed FY10 Activities:** Monitoring data will be collected for reaches 1 through 5. Sonic tracking of native fishes in Reach 3 will continue. Use of remote sensing equipment for PIT 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, 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:** A status report for RASU and BONY in the LCR MSCP area through the end of calendar year 2008 is in preparation and will be presented to the LCR MSCP Steering Committee and made available for viewing on the LCR MSCP Web site.