

Work Task D8: Razorback Sucker and Bonytail Stock Assessment

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$675,000	\$802,447.87	\$4,821,864.39	\$850,000	\$925,000	\$925,000	\$925,000

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Start Date: FY05

Expected Duration: FY55

Long-Term Goal: Conduct long-term system monitoring of razorback sucker and bonytail

Conservation Measures: RASU6 and BONY5

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

Purpose: To supplement and maintain sufficient knowledge and understanding of razorback sucker and bonytail populations within the LCR MSCP planning area in order to have an effective AMP

Connections with Other Work Tasks (Past and Future): Monitoring data for razorback sucker and bonytail have been or will be gleaned from work accomplished under Work Tasks C8 (closed) , C12 (closed), C13, C15 (closed), F5, and G3.

Project Description: Under this work task, razorback sucker and bonytail population and distribution data will be collected and organized 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. Additionally, as short-term research activities are completed under separate work tasks, a portion of those activities may transition into or be included as part of ongoing, long-term monitoring projects under this work task.

Work routinely includes trammel netting and electrofishing, but visual surveys are also periodically conducted, as well as surveys using specialized equipment and techniques (e.g., scuba divers, underwater photography, and video recordings). Funding described under this work task provides for all costs associated with

conducting field surveys, including salaries, travel, and materials necessary to accomplish this work. Funding for monitoring agreements, gleaning, or capturing data from ongoing research actions and monitoring programs; transfer of these data into record archives; and organizing these data into a cohesive report is also provided under this work task.

Previous Activities: In cooperation with the AGFD and NDOW, fall fish surveys on Lake Mead have been conducted since 1999. Reclamation has also participated in interagency cooperative Native Fish Roundups on Lake Mohave since 1987 and on Lake Havasu (including the river reach below Davis Dam) since 1999. This participation has continued under the LCR MSCP, beginning in 2005, when the program was implemented. Additional monitoring of native fish populations outside of these annual events has also been conducted under this work task as short-term research activities have transitioned into long-term monitoring projects.

FY14 Accomplishments: Accomplishments for this work task have been summarized by river reach. Budget expenditures in FY14 exceeded the approved estimate due in part to an expansion in effort in sampling in Reaches 4 and 5, particularly below Palo Verde Diversion Dam. In addition, a large part of these unforeseen expenses in FY14 were for capital equipment repair and replacement. A number of fleet vessels were in need of repairs for safety and reliability concerns, and one boat was replaced with a vessel that was customized specifically for LCR MSCP needs in Reaches 2 and 3.

Reach 1 (Lake Mead): In cooperation with the AGFD and NDOW, annual fall gill net surveys of Lake Mead have been conducted. Participating agencies were responsible for sampling Boulder Basin, Virgin Basin, Gregg Basin, and the Overton Arm. This lake-wide effort resulted in the capture over 2,252 fish, representing 15 different species. A total of 9 razorback sucker were captured during this effort. No additional native fish species were contacted.

Collection of wild-born razorback sucker 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 538 larvae from Las Vegas Bay, 119 larvae from Echo Bay, and 215 larvae from the Muddy River/Virgin River inflow area for a lake-wide total of 872 larvae. A portion of the captured larvae was retained for genetic analyses, with the majority being returned to the lake.

Monitoring of the Lake Mead razorback sucker population also continued. Tracking of sonic-tagged fish continued, and we gathered information on habitat use and movement patterns of razorback sucker. The data obtained from monitoring sonic-tagged fish provided valuable information, including the general location of razorback sucker populations, the location of spawning sites, and the movement patterns of razorback sucker within and among spawning areas.

Trammel netting surveys conducted during the spawning season resulted in the capture of 85 razorback sucker, with 22 coming from Echo Bay, 8 from Las Vegas Bay, and 55 from the Muddy River/Virgin River inflow area. Of the 85 razorback sucker captured, 45 were recaptured fish. The remaining razorback sucker captured were new, wild fish and included 8 from Echo Bay, 5 from Las Vegas Bay, and 27 from the Muddy River/Virgin River inflow area. Aging information was obtained from 35 razorback sucker during the 2014 study year, bringing the total number of razorback sucker aged as part of the long-term monitoring program to 470. Ages of new, wild razorback sucker captured from long-term monitoring areas in 2014 ranged from 5 to 15 years old. The evaluation of fin ray sections removed from captured fish continues to suggest ongoing and recent recruitment in Lake Mead.

Using mark-recapture data from the period spanning 2012–14, the combined lake-wide razorback sucker population was estimated at 589 individuals in 2014. This estimate included mark-recapture data from all areas of the lake, including Echo Bay, Las Vegas Bay, the Muddy River/Virgin River inflow area, and the Colorado River inflow.

Reach 2 (Lake Mohave): A total of 12,317 razorback sucker were successfully repatriated into Lake Mohave in calendar year 2014. This is a decrease from the number of razorback sucker stocked in 2013 (15,369), but above the targeted 6,000.

Annual razorback sucker roundups were conducted in November and March using trammel nets (50 net-nights; 123 razorback sucker contacted), and electrofishing was conducted above Willow Beach from June through October (14,207 seconds; 116 razorback sucker contacted). Based on monitoring data from the 2013 and 2014 field seasons, there was no wild razorback sucker population remaining in Lake Mohave. We estimated that the repatriated razorback sucker population was 2,525 (95% CI from 1,180 to 5,741) during the mark and recapture period and that long-term survival of all repatriates released as of March 1, 2013, was approximately 1%.

The use of remote sensing, which was expanded in 2011 to include the lotic portion of Lake Mohave upstream of Willow Beach, was also continued. Continued improvements in remote PIT tag antenna design have allowed for sampling in the high flow conditions of that reach, thereby contacting a large number of razorback sucker that had been previously undetected through other sampling methodologies.

In 2014, a total of 239,170 remote sensing PIT tag contacts were recorded lake-wide. In the river zone above Willow Beach, 4,091 hours of scan time resulted in 8,253 contacts, representing 1,430 unique razorback sucker. Throughout the rest of Lake Mohave, an effort of 4,753 hours of scan time resulted in 230,917 contacts, representing 1,347 unique razorback sucker. In

summary, a total of 2,777 individual razorback sucker were contacted in 8,844 hours of scan time in 2014. This is slightly lower than the 3,321 individual razorback sucker contacted in 11,293.4 hours of scan time in 2013, but it is very similar to the results from 2012 (2,788 individual razorback sucker contacted in 8,393 hours of scan time).

Based on 2013 and 2014 remote PIT scanning, the 134.2-kHz tagged Lake Mohave repatriate population was estimated at 3,284 individuals (95% CI from 3,067 to 3,516) for the mark and recapture period. Subpopulation estimates using zone-specific scanning were also calculated and estimated the basin zone (River Miles 13–29) population at 1,492 (95% CI from 1,357 to 1,640) and the river zone (River Miles 43–63) population at 2,053 (95% CI from 1,357 to 1,640).

Reach 3 (Lake Havasu): A total of 6,000 razorback sucker and 5,977 bonytail were released into Reach 3 during calendar year 2014; all fish were released with a PIT tag.

Capture/contact data were acquired through Work Tasks C53, C64, F5, ongoing multi-agency Native Fish Roundups, and from other annual surveys conducted by LCR MSCP partners. A fall and spring netting survey was conducted throughout Topock Gorge and lower Lake Havasu. Razorback sucker contacts were more frequent in Topock Gorge than Lake Havasu, but results were comparable to past years. Bonytail contacts via netting increased in FY14; these were all fish released within months of the surveys. Large numbers of razorback sucker continued to be contacted in the riverine portions near Needles, California, and select backwaters throughout Topock Gorge. The remainder of the non-native fish community did not show any substantial changes.

Remote PIT scanning has continued to improve razorback sucker contact rates. Scanning conducted in Reach 3 accounted for 2,324 unique razorback sucker contacts and 2,442 total contacts, including netting and electrofishing contacts. The current razorback sucker population estimate for Reach 3 is 4,456 (95% CI from 4,089 to 4,855). Size at release is the most critical factor affecting survival, and it is highly correlated with contact rate (which is an assumed measure of survival). Season also appears to be an important factor, with fish released in the spring showing higher survival. However, there are limited data for this comparison, and releases directed at validating these results will be incorporated into future fish augmentation strategies.

Reach 4 and 5 (Parker Dam to Imperial Dam): Under the LCR MSCP Fish Augmentation Program, 6,622 razorback sucker and 1,998 bonytail were stocked into Reach 4 during the 2014 calendar year. These fish were released above and below Headgate Rock Dam as part of Work Task C64, and additional fish were

released below Palo Verde Diversion Dam. A small population of razorback sucker continues to persist below Palo Verde Diversion Dam; 98 unique razorback sucker were contacted with scanners in the A-7, A-10, and Palo Verde backwaters. All of these contacts represented fish that were stocked in this reach from 2005 to 2008.

Additionally, 54 larvae were recorded in the A-10 backwater. Overall re-contacts of stocked fish were low in this reach, and population estimates were not calculated due to the low number of contacts.

FY15 Activities: Monitoring data will be collected for Reaches 1–5. Information will be gleaned from ongoing fish research activities as well as through fish monitoring field work. Field work will include trammel netting, electrofishing, remote sensing of PIT-tagged fish, and active and passive tracking of sonic-tagged fish.

Monitoring efforts, including the expanded use of scanners and netting, will be increased for Reaches 4 and 5 below Palo Verde Diversion Dam. These results will be used to guide future stocking locations and additional directed research under Work Tasks C64 and C65.

Proposed FY16 Activities: Monitoring efforts will continue in all river reaches as previously outlined, and participation in multi-agency field surveys will continue. As research-based work tasks are completed in Reaches 1 and 3 (C13 and C45, respectively), gaps in native fish community sampling data are expected. The proposed expansion of monitoring work within these and other reaches will allow for continued collection of data, compensating for the potential sampling gaps that resulted from the closure of multiple research work tasks. These closures can be advantageous, as a portion of research funding can be redistributed toward monitoring. The proposed funding increases for FY16–18 represent this redistribution effort to direct research under Species Research (Section C) work tasks to monitoring under Work Task D8. Overall, this will result in lower total expenditures based on a less intensive sampling effort, as only a portion of the research efforts will transition into monitoring. Take, for example, that \$75,000 was added to the proposed estimate for FY16–18. This additional funding will cover the Lake Mead Colorado River inflow and lower Grand Canyon monitoring effort, an effort that was previously accomplished under research Work Task C13. The \$75,000 represents a reduction in effort and overall cost for the collection of these data (approximately half the dollar amount used under Work Task C13). This less intensive effort will be accomplished primarily through the deployment of remote PIT tag sensing units, and the estimated funding increase includes the costs associated with acquisition of these units and their long-term maintenance.

Pertinent Reports: The reports titled *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 2013–2014 Final Annual Report*, *2014 Lake Mohave Razorback Sucker Monitoring Annual Report*, *Comparative Survival of Repatriated Razorback Sucker in Lower Colorado River Reach 3 – 2014 Annual Report*, and *Movements of Sonic Tagged Razorback Suckers Between Davis and Parker Dams (Lake Havasu) Final Report* will be posted on the LCR MSCP Web site following review.