

Work Task D8: Razorback Sucker and Bonytail Stock Assessment

FY15 Estimate	F15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$850,000	\$846,376.22	\$5,723,554.08	\$925,000	\$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 suckers and bonytail

Conservation Measures: RASU6 and BONY5

Location: The lower Colorado River 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 Adaptive Management Program

Connections with Other Work Tasks (Past and Future): Monitoring data for razorback suckers 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 under 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 the data into record archives; and organizing the data into a cohesive report is also provided under this work task.

Previous Activities: In cooperation with the Arizona Game and Fish Department and Nevada Department of Wildlife, 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.

FY15 Accomplishments: Accomplishments for this work task have been summarized by river reach.

Reach 1 (Lake Mead): In cooperation with the Arizona Game and Fish Department and Nevada Department of Wildlife, annual fall gill net surveys of Lake Mead were conducted. Participating agencies were responsible for sampling Boulder Basin, Virgin Basin, Temple Basin, Gregg Basin, and the Overton Arm. LCR MSCP staff captured a total of 299 fish representing 10 different species from the Virgin and Temple Basins. Two razorback suckers 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. A total of 339 larvae were captured, with 104 larvae from Las Vegas Bay, 137 larvae from Echo Bay, and 98 larvae from the Muddy River/Virgin River inflow area. All larvae collected through this effort were returned to the lake following each sampling period, as razorback sucker larval abundance was primarily used only as a means of identifying spawning locations during the 2014–15 field season.

Monitoring of the Lake Mead adult razorback sucker population also continued in FY15. Twenty sonic-tagged fish were contacted throughout the year using active and passive telemetry. Monitoring sonic-tagged fish provided the general location of razorback sucker populations, the location of spawning sites, habitat association data within the long-term monitoring study area, and lake-wide and seasonal movement patterns within and among spawning areas. Trammel netting conducted during the spawning season resulted in the capture of 18 razorback

suckers: 2 from Las Vegas Bay, 1 from Echo Bay, and 15 from the Muddy River/Virgin River inflow area. Of the 18 razorback suckers captured, 9 were recaptured fish. The remaining razorback suckers captured were untagged and presumed to be wild-spawned fish (hereafter referred to as wild). These fish included two from Las Vegas Bay and seven from the Muddy River/Virgin River inflow area. Aging information was obtained from 8 razorback suckers during the 2015 study year, bringing the total number of razorback suckers aged as part of the long-term monitoring program to 478. The ages of wild razorback suckers captured from long-term monitoring areas in 2015 ranged from 5 to 10 years old.

No Lake Mead razorback sucker population estimate is provided for the 2014–15 study year, as low recapture rates produced an unrealistic estimate in the statistical program MARK. Population estimates have, however, been consistent for the previous 5 study years (2010 – 541, 2011 – 733, 2012 – 596, 2013 – 597, and 2014 – 589). Additional sampling efforts are planned for FY16 so that a reliable estimate may be obtained.

Reach 2 (Lake Mohave): A total of 15,899 razorback suckers were successfully repatriated into Lake Mohave in FY15. This is an increase from the number of razorback suckers stocked in 2014 (11,789) and above the targeted 8,000 as outlined in the Native Fish Augmentation Plan.

Annual razorback sucker roundups were conducted in December and March. During this effort, 200 razorback suckers were captured using trammel nets. Additionally, electrofishing was conducted above Willow Beach in February, June, July, September, and October (13,952 seconds and 63 razorback suckers captured). 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 passive integrated transponder (PIT) tag antenna design have allowed for sampling in the high flow conditions of that reach, thereby contacting a large number of razorback suckers that had been previously undetected through other sampling methods.

In FY15, a total of 98,720 remote-sensing PIT tag contacts were recorded lake-wide. In the river section of Lake Mohave above Willow Beach, 6,385 hours of scan time resulted in 11,269 total contacts, representing 1,549 unique PIT tags. Throughout the rest of Lake Mohave, an effort of 23,008 hours of scan time resulted in 87,451 contacts, representing 1,510 unique PIT tags. In summary, a total of 3,059 unique PIT tags were contacted in 29,393 hours of scan time in FY15. This is slightly higher than the 2,777 PIT tags contacted in 8,844 hours of scan time in 2014, but it is very similar to the results from 2013 (3,321 PIT tags contacted in 11,293 hours of scan time).

The razorback sucker population in Lake Mohave was estimated from two data sources in FY15: (1) trammel net capture data obtained during the annual, multi-agency March roundup and (2) remote PIT scanning data collected during the sample year. Based on trammel net data from the FY15 field season,

the repatriate population estimate for Lake Mohave is 2,230 (95-percent [%] confidence interval [CI] from 922 to 5,963). This estimate represents less than 1% of the total number of repatriates released into Reach 2 as of March 1, 2014. Based on 2014–2015 remote PIT scanning, the Lake Mohave repatriate population was estimated at 3,505 individuals (95% CI from 3,279 to 3,756). Subpopulation estimates using zone-specific scanning were also calculated and estimated the basin (River Miles 13–29) population at 1,808 (95% CI from 1,635 to 2,009) and the river (River Mile 43–63) population at 2,039 (95% CI from 1,861 to 2,245).

Reach 3 (Lake Havasu): A total of 6,348 razorback suckers and 5,729 bonytail were released into Reach 3 during FY15; 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 the results were comparable to past years. Bonytail contacts via scanning are still rare and typically only occur for the first several months post-release. Large numbers of razorback suckers continued to be contacted in the riverine portions near Needles, California, and select backwaters throughout Topock Gorge. Two new spawning aggregations were located at alluvial washes just south of Needles, California. Based on the species composition and relative numbers of captures, the non-native fish community in these locations did not appear to be substantially different than in previous years.

Remote PIT scanning has continued to improve razorback sucker contact rates. All survey methods conducted in Reach 3 resulted in 4,179 unique razorback sucker and 188 bonytail contacts. The current razorback sucker population estimate for Reach 3 is 4,795 (95% CI from 4,496 to 5,124). Size at release is the most critical factor correlated with contact rate, which is considered an index of survival. Season also appears to be an important factor; fish released in spring continued to have higher contact rates (survival). These correlations between survival and total length at release and season of release are based on limited data. To provide better comparisons, releases directed at validating these results may be incorporated into future fish augmentation strategies.

Reaches 4 and 5 (Parker Dam to Imperial Dam): A total of 3,494 razorback suckers were stocked above Headgate Rock Dam during FY15; all fish were released with a PIT tag. A total of 1,797 razorback suckers and 4,864 bonytail were stocked below Palo Verde Diversion Dam during the fiscal year; all fish were released with a PIT tag.

Monthly PIT tag scanning and one netting survey in February 2015 yielded 236 razorback suckers and 258 bonytail contacted in Reaches 4 and 5. Only

one fish, a razorback sucker, was contacted by remote scanning in Reach 5. Additionally, 18 razorback sucker larvae were contacted in Reach 4, and 3 razorback sucker larvae were contacted in Reach 5.

FY16 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.

Additional monitoring will occur in Reaches 1 and 3 during FY16 to supplement the current level of effort and offset the completion of other research-based work tasks (C13 and C45 [closed]). The funding increases for D8 in FY16 represent this redistribution of efforts under Species Research (Section C) work tasks into monitoring under Work Task D8. Overall, this will result in lower total program expenditures based on a less intensive sampling effort, as only a portion of these research efforts will transition into monitoring under Work Task D8. This less intensive effort will be accomplished primarily through the deployment of remote PIT tag sensing units, so funding was increased to include the costs associated with the acquisition of these units and their long-term maintenance.

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 FY17 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 1–5, gaps in native fish community sampling data are expected. Efforts under Work Task D8 will fill a portion of these gaps by maintaining the appropriate level of system-wide monitoring of native fishes in the lower Colorado River for the life of the program.

Pertinent Reports: The reports titled *Razorback Sucker Studies on Lake Mead, Nevada and Arizona 2014–2015 Final Annual Report*, *Demographics and Monitoring of Repatriated Razorback Sucker in Lake Mohave 2015—Annual Report*, *Comparative Survival of Repatriated Razorback Sucker in Lower Colorado River Reach 3 – 2014 Annual Report*, *Comparative Survival of Repatriated Razorback Sucker in Lower Colorado River Reach 3 – 2015 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.