

## Work Task C57: Sonic Telemetry of Lake Mead Juvenile Razorback Suckers

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$250,000	\$226,958.99	\$541,878.93	\$0	\$0	\$0	\$0

**Contact:** Jim Stolberg, (702) 293-8206, [jstolberg@usbr.gov](mailto:jstolberg@usbr.gov)

**Start Date:** FY13

**Expected Duration:** Closed in FY15

**Long-Term Goal:** Support razorback sucker conservation

**Conservation Measures:** RASU 6

**Location:** Reach 1, Lake Mead, Arizona/Nevada

**Purpose:** To investigate habitat use of immature razorback suckers and evaluate conditions that allow for natural recruitment of Lake Mead razorback suckers

**Connections with Other Work Tasks (Past and Future):** This work task is related to Work Tasks C13 and D8.

**Project Description:** From 1996 to 2011, 95 sonic-tagged adult razorback suckers have aided researchers in locating spawning populations of this species in Lake Mead and in understanding the habitat use and spawning preferences of the adult population. Trammel netting efforts during this time also provided valuable information on Lake Mead razorback sucker demographics and included the capture of over 100 juvenile/subadults. Limited effort has been expended trying to capture this young life stage, which is an important element in understanding why razorback sucker recruitment is occurring in Lake Mead. The habitat use of immature razorback suckers will be investigated through the use of sonic telemetry, and an attempt will be made to capture additional wild, immature razorback suckers through traditional fisheries techniques. A portion of the sonic-tagged fish will be released at different times during each study year to target and evaluate seasonal habitat use.

**Previous Activities:** This study builds upon work conducted on the Lake Mead adult razorback sucker population (Work Tasks C13 and D8).

Sonic telemetry of juvenile, Lake Mead razorback suckers was initiated in FY13 and continued in FY14. Eighteen juvenile razorback suckers were surgically implanted with sonic transmitters in May 2013 and released as three groups of six into Las Vegas Bay, Echo Bay, and the Muddy River/Virgin River inflow area. Six of these fish (233–246 millimeters [mm] total length [TL]) received 3-month transmitters, and 12 fish (270–295 mm TL) received 12-month transmitters. An additional 18 juvenile fish were surgically implanted with sonic transmitters in FY14 and released in the same locations as the previous year. Twelve fish (280–300 mm TL) received 12-month transmitters and were released as groups of four in March. The remaining six fish (237–255 mm TL) received 3-month transmitters and were released as three pairs in September. Active and passive sonic surveillance were used throughout both years to characterize the movements and habitats occupied by these juvenile fish as well as to provide locations for sampling efforts. Three months of intensive sonic surveillance and fish community sampling were conducted each year following the release of fish with 3-month transmitters in an effort to use these fish to capture additional wild, immature razorback suckers of this smaller size class. Contacts resulting from active sonic surveillance have allowed for quantification and assessment of over 350 habitat replicates. Individual fish were observed to use similar habitat throughout the lake regardless of location or season, associating with shallow, densely vegetated habitat in spring, deeper habitats with no apparent cover other than turbidity in summer and early fall, and a shift back to shallower habitats with cover during the fall months. While no additional wild, juvenile fish have been contacted through this effort, 11 adult razorback suckers were captured in direct association with sonic-tagged juvenile fish in Echo and Las Vegas Bays during FY14. Nine of these fish were new, wild captures, and although these individuals were relatively large in comparison to their sonic-tagged counterparts, similarities in behavior and habitat selection were observed. This discovery also highlighted the continued success in using sonic-tagged razorback suckers to locate additional wild individuals.

**FY15 Accomplishments:** An additional 18 juvenile razorback suckers were obtained from the Lake Mead Fish Hatchery (B6) and surgically implanted with sonic transmitters. Fish were again selected from two separate size classes of juveniles and received sonic tags with either a 3- or 12-month battery life. Eleven fish (281–299 mm TL) received 12-month sonic tags and were released into three study sites in Lake Mead (Las Vegas Bay, Echo Bay, and the Muddy River/Virgin River inflow area) in May. This group allowed for sonic surveillance, characterization of movements, and habitat use assessments to be conducted throughout the year. Results from active sampling near sonic-tagged juveniles resulted in the capture of two new, wild razorback suckers. These fish measured 435 and 550 mm TL.

The remaining seven fish (210–245 mm TL) received 3-month sonic tags and were released at the same three study sites in December 2015 (FY16). Fish were released during this period to specifically target and evaluate habitat use during

the winter months. The intensive sonic surveillance and community sampling effort began with the stocking of these fish and will continue through February 2016. Intensive sampling will be conducted in areas where sonic-tagged fish are located and will include the use of electrofishing, minnow traps, hoop nets, trammel nets, fyke nets, and seines. Intensive sampling has not resulted in the capture of any additional razorback suckers to date; however, a suite of non-native fishes has been captured in association with sonic-tagged juveniles, including a 450-mm smallmouth bass with a juvenile razorback sucker sonic tag in its stomach. This juvenile was 230 mm TL at the time of its release.

Intensive sonic surveillance, habitat assessment, fish community sampling, and collection of physicochemical data associated with juvenile razorback suckers will continue through March 2016. A final annual report will be prepared following completion of the 2015–16 study period. Funds obligated in FY15 will be used to complete this effort; therefore, no additional costs will be incurred under this work task in FY16. Any assistance needed to support these field efforts in FY16 will be provided through efforts conducted under Work Task D8. A portion of these regular monitoring efforts will also be supported through system-wide monitoring (D8) into the future.

**FY16 Activities:** This work task was closed in FY15.

**Proposed FY17 Activities:** This work task was closed in FY15.

**Pertinent Reports:** Annual reports for the 2014–15 field seasons have been posted on the LCR MSCP Web site. The *Sonic Telemetry and Habitat Use of Juvenile Razorback Suckers in Lake Mead: 2015–2016 Annual Report* will be posted upon completion.