

Work Task B7: Lakeside Rearing Ponds

FY16 Estimate	FY16 Actual Obligations	Cumulative Expenditures Through FY16	FY17 Approved Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate	FY20 Proposed Estimate
\$200,000	\$149,862.21	\$2,213,025.03	\$200,000	\$200,000	\$200,000	\$200,000

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Start Date: FY05

Expected Duration: FY55

Long-Term Goal: Maintain fish rearing capability, provide razorback suckers (*Xyrauchen texanus*) and bonytail (*Gila elegans*) to the LCR MSCP Fish Augmentation Program, and accomplish species research

Conservation Measures: BONY3, BONY4, BONY5, RASU3, RASU4, RASU5, and RASU6

Location: Reach 2, Lake Mohave, Arizona/Nevada

Purpose: To operate and maintain fish grow-out areas along the Lake Mohave shoreline to contribute to razorback sucker broodstock development

Connections with Other Work Tasks (Past and Future): Activities are related to Work Tasks B2 and B4, as fish for grow-out ponds come from the Willow Beach National Fish Hatchery (Willow Beach NFH) and the Southwestern Native Aquatic Resources and Recovery Center in Dexter, New Mexico. In addition, some of the fish rearing research activities outlined in Work Tasks C34 (closed), C40, C44 (closed), and C63 may be conducted at these ponds.

Project Description: Lake Mohave is operated by the Bureau of Reclamation (Reclamation) as a reregulation reservoir. It fluctuates annually within a 15-foot vertical range, filling by mid-May and lowering to an annual minimum in October. Wave actions redistribute sediment deposits from desert washes and shape these deposits into sandbars or natural berms. In some areas, these sandbars isolate the lower portions of the desert washes from the lake proper, and when the lake is at full pool, lakeside ponds form at many of these washes. Reclamation and its partners in the Lake Mohave Native Fish Work Group have been using these lakeside ponds since 1992 as rearing and grow-out areas for razorback suckers and bonytail. The ponds are stocked with juvenile fishes as the reservoir fills (typically stocked in late January). The LCR MSCP monitors and

manages the ponds throughout the growing season. This work includes periodic monitoring of plankton production, removal of weeds and debris, population monitoring through the use of remote sensing technologies, and routine monitoring of physical, chemical, and biological parameters. The ponds are normally harvested in fall as the lake elevation declines. The fishes from these ponds are then released back into Lake Mohave. The LCR MSCP anticipates the need for these ponds to support razorback sucker and bonytail conservation through FY55.

Previous Activities: These ponds have been in use since 1992, and nearly 33,000 razorback suckers have been reared and repatriated into Lake Mohave. In an effort to expedite development of the razorback sucker broodstock, the target size for repatriation was increased to 500 millimeters (mm) total length (TL) during 2007. Since this new target size went into effect, the ponds have been managed to rear larger-sized fish for the LCR MSCP. Typically, razorback suckers in excess of 300 mm TL are stocked into the ponds and then harvested in spring and/or fall. Beginning in 2012, surplus in situ spawned fish were harvested and fin clipped and/or passive integrated transponder (PIT) tagged and transferred to Reach 3 below Davis Dam.

FY16 Accomplishments: Four backwaters were stocked at the beginning of the year with juvenile razorback suckers. These fish were originally collected from Lake Mohave as larvae and then reared at the Willow Beach NFH. All fish were stocked at a size of at least 300 mm TL to be consistent with the minimum release target length. All males were stocked into Willow backwater to assess reproductive behavior on growth. Aquatic dye treatments were attempted in the Arizona Juvenile (AJ) backwater to reduce submerged plant growth that inhibited harvest efforts in past years. While all stockings of the Lake Mohave backwaters were supported work under Work Task B7, several of the backwaters were also used to conduct concurrent species research work tasks. Specifically, the North Chemehuevi and Willow backwaters were stocked solely in support of Work Task B7. The AJ and Dandy backwaters were stocked as part of Work Task C40. These backwaters received 99, 50, 102, and 100 razorback suckers, respectively, for a total of 351 razorback suckers stocked into Lake Mohave backwaters in FY16 (table 1).

In FY16, 87 razorback suckers were harvested from all the previously stocked backwaters and repatriated into Lake Mohave. The mean TL for all backwater fish during this harvest was 455 mm, with a range of 429–468 mm (table 1). These fish were all from the 2013 year-class. All fish were PIT tagged prior to initial stocking into the backwaters; however, harvested fish were rescanned at the time of harvest, and a new tag was inserted if the original PIT tag was not detected. The AJ backwater was compromised by a flood event that occurred in April 2016 that connected the backwater directly to Lake Mohave. An unknown number of untagged razorback suckers were released into the lake from the AJ backwater after this event.

Table 1.—2016 Stocked Adult Razorback Suckers Repatriated into Lake Mohave from Lakeside Rearing Ponds

Backwater		Number Stocked		Mean TL at Stocking (mm)		Number Harvested		Mean TL at Harvest (mm)		Percent Harvested from 2016 Stocking
Willow		50		370		34		429		68.0
Dandy		100		382		33		467		33.0
Arizona Juvenile*		102		380		0		N/A		0.0
North Chemehuevi		99		382		20		468		20.2
Total or Overall Mean Value	Total	351	Mean	380	Total	87	Mean	455	Mean	24.8

* The Arizona Juvenile backwater berm was breached in April 2016. The total number of fish that escaped is unknown.

A breakdown of backwater-harvested fish for FY16 is as follows: 15 stocked adult razorback suckers (mean TL = 552) were netted from the Yuma Cove backwater in May 2016, and an additional 29 razorback sucker recruits from prior stockings were also harvested from the Yuma Cove backwater (mean TL = 455). All newly captured recruits received a PIT tag, and genetic (tissue) samples were collected as part of Work Task C40. All fish were returned to the Yuma Cove backwater. Six in situ-produced fish with a range of 280–310 mm (recruits from reproduction) captured from the Dandy backwater were PIT tagged and transferred to Reach 3. Table 1 lists the numbers of fish repatriated into Lake Mohave from the 2016 harvest, excluding the Yuma Cove and Davis backwaters.

A total of 400 year-class 2012 adult bonytail provided by the Southwestern Native Aquatic Resources and Recovery Center were stocked in equal proportions in the North Nine Mile and Nevada Egg backwaters in 2016 as part of Work Task C40. None of the adults in Nevada Egg and North Nine Mile backwaters were harvested in 2016.

Harvest efforts can be variable from year to year depending on fish survival and other contributing factors. Total harvest numbers were low in FY16, and no fish were harvested from the AJ backwater due to the berm breach.

FY16 obligations were less than anticipated, as labor costs were covered under ongoing research tasks (C40 and C63) and partners provided in-kind participation for backwater maintenance.

FY17 Activities: Lakeside ponds are again being used for razorback sucker broodstock maintenance and development. Genetic and demographic data related to Work Task C40 in the AJ, Yuma, and Dandy backwaters will continue to be gathered, and in situ voluntarily spawned fish will continue to be harvested and released into downstream locations in Reach 3 below Davis Dam.

The North Nine Mile and Nevada Egg backwaters will not be stocked with bonytail in FY17; instead, Nevada Egg backwater will be stocked with 50 razorback suckers in support of Work Task B7. The Willow Beach NFH will provide the fish for these stockings.

Remote sensing technology will continue to be expanded to all fish-stocked backwaters in the form of continuous PIT tag scanning from the time of initial stocking until the final harvest. Data collected from continuous population monitoring through remote sensing will be used to address variability in survival rates both spatially and temporally.

Stocking densities will be reduced in FY17 based on the limited number of available fishes from the Willow Beach NFH due to the outbreak of the parasite Ich (*Ichthyophthirius multifiliis*) at that facility in early FY17. The AJ and Dandy backwaters will be stocked with 100 individuals each in support of activities associated with Work Task C40. The Nevada Egg and Willow backwaters will each receive 50 razorback suckers. The Davis, North Nine Mile, and North Chemehuevi backwaters will not be stocked in FY17. Sex ratios in the Willow and Nevada Egg backwaters will be manipulated to evaluate the role reproductive behavior has on growth in these closed-system environments. Additionally, the Nevada Egg backwater will be treated with an aquatic dye, as needed, to reduce submerged vegetation and surface algal mats. The Yuma Cove backwater will not be augmented in FY17 based on monitoring activities associated with Work Task C40.

Proposed FY18 Activities: Lakeside ponds along the shoreline of Lake Mohave will be operated and maintained for native fishes. Stocking densities will continue at approximately 100 individuals per location. Experimental stocking regimes will continue to be explored in the current non-research Davis, Nevada Egg, North Nine Mile, North Chemehuevi, and Willow backwaters. All ponds will be monitored regularly to ensure survivorship is maximized during the grow-out phase prior to repatriation. Continuous proactive measures will need to be implemented to ensure backwater habitats are free of surface algal mats and dense submerged vegetation that has likely impacted the water quality of various ponds in past years. Voluntarily spawned fish from backwaters will continue to be transported downstream from Davis Dam.

Pertinent Reports: N/A