Work Task B7: Lake-Side Rearing Ponds

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
$200,000	$181,782.56	$2,050,370.87	$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 and bonytail to the LCR MSCP Fish Augmentation Program, and accomplish species research

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

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 and Southwestern Native Aquatic Resources & Recovery Center. 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 re-regulation 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, lake-side ponds form at many of these washes. Reclamation and its partners in the Lake Mohave Native Fish Work Group have been using these lake-side 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). LCR MSCP staff members monitor the fish and manage the ponds throughout the growing season. This work

includes periodic monitoring of plankton production, removal of weeds and debris, installing and maintaining solar well pumps to mix the water and provide sufficient oxygen levels, 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 fish from these ponds are then released back into Lake Mohave. Reclamation 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 more than 32,000 razorback suckers have been reared and repatriated into Lake Mohave. In an effort to expedite development of 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 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.

FY15 Accomplishments: Five backwaters were stocked at the beginning of the year with juvenile razorback suckers that were originally collected from Lake Mohave as larvae and then reared at the Willow Beach National Fish Hatchery. All fish were stocked at a size of at least 300 mm TL to be consistent with the minimum release target length. While all stockings of the Lake Mohave backwaters supported work under Work Task B7, several of the backwaters were also used to conduct concurrent species research work tasks. Specifically, the North Chemehueve and Willow backwaters were stocked solely in support of Work Task B7. The Arizona Juvenile (AJ), Dandy, and Yuma Cove backwaters were stocked as part of Work Task C40. These backwaters received 200, 50, 200, 200, and 100 razorback suckers, respectively, for a total of 750 razorback suckers stocked into Lake Mohave backwaters in FY15.

The total number of fish harvested from the backwaters from stocking in FY15 and repatriated into Lake Mohave in FY15 was 243. The mean TL for all backwater fish during this harvest was 430 mm, with a range of 325–520 mm. These fish were all from the 2011 year class. All fish were PIT tagged prior to initial stocking into the backwaters; however, harvested fish were re-scanned at the time of harvest, and a new tag was inserted if the original PIT tag was not detected. A breakdown of backwater harvested fish for FY15 is as follows: 20 stocked adult razorback suckers (mean TL = 507) were netted from the Yuma Cove backwater in May 2015, and an additional 124 razorback sucker recruits from prior stockings were also harvested from the Yuma Cove backwater (mean TL = 422). All captured recruits received a new PIT tag, and genetic (tissue) samples were collected as part of Work Task C40. All fish were returned to the Yuma Cove backwater. A total of 102 in situ-produced fish (recruits

from reproduction) greater than 300 mm captured from the Dandy and North Chemehueve backwaters were PIT tagged and transferred to Reach 3 to supplement LCR MSCP augmentation initiatives. An additional lot of more than 470 spawned razorback suckers captured from the ponds that measured less than 300 mm TL were also PIT tagged and released into Reach 3. Table 1 lists the numbers of fish repatriated into Lake Mohave from the 2015 harvest, excluding the Yuma Cove and Davis backwaters.

Table 1.—2015 Stocked Adult Razorback Suckers Repatriated into Lake Mohave from Lake-Side Rearing Ponds

Backwater		Number Stocked		Mean TL at Stocking (mm)		Number Harvested		Mean TL at Harvest (mm)		Percent Harvested from 2015 Stocking
Yuma Cove*		100		368		0		0		0.0
Willow		50		359		40		441		80.0
Dandy		200		362		85		412		42.5
Arizona Juvenile		200		364		53		415		26.5
North Chemehueve		200		360		65		457		32.5
Davis Cove		0		0		0		0		0.0
Total or Overall Mean Value	**Total**	**750**	**Mean**	**363**	**Total**	**243**	**Mean**	**431**	**Mean**	**32.4**

* Backwater sampled with no repatriates released into Lake Mohave. The Yuma Cove backwater was excluded from the totals due to project goals related to Work Task C40.

A total of 399 year class 2012 adult bonytail provided by the Southwestern Native Aquatic Resources & Recovery Center were stocked in equal proportions in the North Nine Mile and Nevada Egg backwaters in 2015 as part of Work Task C40. A total of 53 adults previously stocked in Nevada Egg and 10 previously stocked in North Nine Mile were harvested in 2015 and repatriated into Lake Mohave. The mean TL for all backwater adult bonytail at harvest was 297 mm, with a range of 255–355 mm. None of the bonytail repatriated into Lake Mohave were used to fulfill LCR MSCP augmentation goals.

FY16 Activities: Lake-side 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 again be stocked with bonytail to quantify genetic and demographic parameters. This work is related to investigations into reproductive success of razorback suckers in the AJ, Yuma, and Dandy ponds (C40).

Remote sensing technology will be expanded to all 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 all backwaters to100 individuals per location to assess the impact of reduced density on growth and survival. The Willow backwater will continue to be stocked with 50 individuals. Sex ratios in the Willow backwater will be manipulated to evaluate the role reproductive behavior has on growth in these closed system environments. The Yuma Cove backwater will not be augmented in FY16 based on monitoring activities associated with Work Task C40. The Davis backwater will be stocked with 100 individuals to supplement Work Task C63 objectives.

Proposed FY17 Activities: Lake-side ponds along the shoreline of Lake Mohave will be operated and maintained for native fish. Stocking densities will continue at approximately 100 individuals per location. Sex ratio dynamics will continue to be explored in the current non-research North Chemehueve and Willow backwaters. All ponds will be monitored regularly to make sure 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 water quality over various ponds in past years. Voluntarily spawned fish from backwaters will continue to be transported downstream from Davis Dam.

Pertinent Reports: N/A