

Work Task F5: Post-Development Monitoring of Fish at Conservation Areas

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$265,000	\$235,350.31	\$1,521,894.58	\$250,000	\$250,000	\$350,000	\$350,000

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Start Date: FY07

Expected Duration: FY55

Long-Term Goal: Post-development monitoring

Conservation Measures: RASU6 and BONY5

Location: Backwater habitats (Reaches 3–6)

Purpose: To monitor fish use of habitat creation sites in order to provide data for the adaptive management process and to develop management guidelines for created backwater habitats

Connections with Other Work Tasks (Past and Future): Post-development monitoring will be conducted at all backwaters created under Conservation Area Development and Management (Section E) work tasks and Work Tasks C23 (closed), C31, C33 (closed), C34 (closed), C40, and C41 (closed).

Project Description: Fish and fish habitat will be monitored at conservation areas. It is anticipated that these areas will play various roles in the conservation of target fish species throughout the term of the LCR MSCP. Some habitats will be able to develop self-sustaining populations; others may become overpopulated, requiring harvest or thinning; and some will require continuous population augmentation. Most isolated fish habitats will require some stock rotation to maintain genetic diversity through time. Basic surveys of the fish population and the physical and chemical components in developed or restored habitats will be required. Fish monitoring will include trapping (hoop, fyke, and minnow traps), trammel netting, electrofishing, larvae light trapping, and ocular surveys (including scuba and snorkeling where necessary and practical). Water quality assessments will require annual measurements of temperature, oxygen, pH, and conductivity (salinity) as well as periodic monitoring of chemical makeup and selenium.

Previous Activities: Since 2006, Beal Lake has been renovated and stocked with more than 6,000 razorback suckers and 2,000 large bonytail (an additional 27,000 young-of-the-year bonytail have also been released); a limited portion of each of these stockings was marked with passive integrated transponder (PIT) tags. Non-natives were identified shortly after the renovation efforts. Through annual surveys, subsets of each of these stockings have been contacted, but long-term survival has been low. A more intensive monitoring effort using remote sensing was initiated in FY09 and continued through FY11. Populations of stocked razorback suckers declined rapidly within the first several months post-release and eventually leveled off near 100 individuals. Water quality has been monitored constantly with multi-parameter water quality loggers, and all parameters have remained within the known ranges of acceptability for native fishes.

In 2012, stockings were discontinued at Beal Lake, and fisheries surveys were reduced to a relative abundance and biomass estimate for all species within the backwater. Results of this survey indicated that the backwater contained at least six different species but, relative to the size of the backwater, had low overall numbers of fishes (approximately 4,000). Non-native fishes were the dominant species in the lake, accounting for almost 90 percent of the total fishes.

A large fishkill was observed in February 2013; water samples confirmed a golden algae bloom. Monthly golden algae monitoring was initiated immediately following its detection. No fishes were observed for several months after the event. By mid-summer, young-of-year largemouth bass were observed in the backwater. Golden algae have not been detected in the backwater since May 2013, and the non-native fish community has rebounded since the fishkill. The backwater was isolated from Topock Marsh following the detection of golden algae in 2013; this closure resulted in a rapid increase in specific conductivity, which approached 11,000 microsiemens per centimeter in FY14.

Routine monitoring of the Big Bend Conservation Area (BBCA) has been conducted monthly from February through May and has included electrofishing, trammel netting, remote PIT scanning, and larval light trapping in areas where there have been historical contacts of native fishes and adequate water levels to permit access for sampling. Water quality profiles were conducted during each monitoring trip and at least quarterly the remainder of the year. Through monitoring, low numbers of razorback and flannelmouth suckers continued to be contacted, including larvae of both species and an occasional flannelmouth sucker subadult. The backwater has a direct surface connection to the lower Colorado River; consequently, water quality parameters mirror that of the river.

FY15 Accomplishments: The water quality at Beal Lake was monitored throughout the backwater using permanently deployed multi-parameter instruments. Low levels of dissolved oxygen and high temperatures were observed locally but not lake-wide. Conductivity has decreased to nearly

6,000 microsiemens per centimeter following some inlet canal maintenance and the opening of valves that reconnected the backwater to Topock Marsh. Zooplankton and phytoplankton results continue to show relatively low levels of plankton biomass. No golden algae have been detected in Beal Lake since May 2013.

Routine monitoring at the BBCA continued in FY15; native fish contacts included 12 razorback suckers and 3 flannelmouth suckers. All but one of the razorback suckers originated from localized stocking events from the past 3 years. Larval flannelmouth and razorback suckers were captured at rates similar to previous years. Multiple telemetered juvenile flannelmouth suckers (Work Task C53) were again contacted in the dense bulrush stands near the center of the backwater. Water quality parameters remained within thresholds for all native fishes.

FY16 Activities: Monitoring activities at Beal Lake will be focused on water quality and plankton, with limited fish monitoring. Monthly golden algae sampling will continue throughout the year. Research projects will be outlined for the next few years, and study plans will be completed in FY16.

The BBCA will be monitored at a level similar to FY15. Semipermanent remote PIT scanners will be deployed in an effort to increase scanning contacts for all species.

Proposed FY17 Activities: The activities from FY16 will continue into this year. Native fish research projects at Beal Lake will be initiated under Section C work tasks. Research will focus on fish use of cover (C63) and the impact of piscivorous bird predation (C65) in the lake.

BBCA activities will be similar to those of the previous year and will include trammel netting, remote PIT scanning, larval surveys, and water quality monitoring.

Pertinent Reports: A report titled *Beal Lake Species Abundance and Biomass* is complete and will be posted on the LCR MSCP Web site upon completion.