

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

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$250,000	\$271,044.01	\$1,286,639.20	\$265,000	\$250,000	\$250,000	\$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.

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 habitat developed or restored 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 assessment will require annual measurements of temperature, oxygen, pH, and conductivity (salinity) as well as periodic monitoring of chemical makeup, including electro-ions and selenium.

Previous Activities: Since 2006, Beal Lake has been renovated and stocked with more than 6,000 razorback sucker 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 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 sucker 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 fish.

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 fish (approximately 4,000). Non-native fishes were the dominant species in the lake, accounting for almost 90% of the total fish.

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 fish were observed for several months after the event. By mid-summer, young-of-year largemouth bass were observed in the backwater.

Routine monitoring of the BBCA was conducted monthly from February through May and included electrofishing, trammel netting, and larval light trapping in areas where there have been historical contacts of native fish 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 sucker and flannelmouth sucker continued to be contacted, including larvae of both species and flannelmouth sucker subadults. The backwater has a direct surface connection to the LCR; consequently, water quality parameters mirror that of the river.

FY14 Accomplishments: Water quality at Beal Lake was monitored throughout the backwater using permanently deployed multi-parameter instruments. Low levels of DO and high temperatures were observed locally but not lake-wide. 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 $\mu\text{S}/\text{cm}$ in FY14. 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. Limited electrofishing and netting surveys in FY14 resulted in detections of many

of the non-native species that were known to have previously inhabited the backwater. The majority of these fish were in the juvenile size classes, with the exception of one large carp.

Routine monitoring at the BBCA continued in FY14; native fish contacts included eight razorback sucker and one flannelmouth sucker. All of the razorback originated from localized stocking events from the past two years. Larval flannelmouth sucker and razorback sucker were captured at rates similar to years past. Multiple telemetered juvenile flannelmouth sucker from Work Task C53 were routinely contacted in the dense bulrush stands near the center of the backwater. Remote PIT scanners were deployed, and 14 razorback sucker within the conservation area were successfully contacted. This monitoring tool is not effective on flannelmouth sucker due to the lack of fish with PIT tags. Fish surveys at this location were highly influenced by river operations from Davis Dam. Water quality parameters remained within thresholds for all native fish.

FY15 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. Infrastructure improvements to facilitate management of water quality are planned for FY15 and will be implemented under Work Task E1.

The BBCA will be monitored at a level similar to FY14. In lieu of electrofishing, additional effort will be expended to deploy remote PIT scanners during routine monitoring.

Proposed FY16 Activities: The activities from FY15 will continue into this year. If Beal Lake remains free of golden algae, and infrastructure improvements are completed, management of the backwater for native fish will resume. Before any additional stocking of native fish at Beal Lake occurs, a study/management plan will be developed.

BBCA activities will be similar to those of the previous year and will include electrofishing and deployment of remote PIT scanners.

Out-year budget estimates have been increased in anticipation of additional water quality and fisheries monitoring efforts being assumed under this work task. Specifically, these include: monitoring at the MVCA backwater (E35) when construction is completed and the incorporation of regular monitoring efforts at Imperial Ponds (C25).

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