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

FY13 Estimate	FY13 Actual Obligations	Cumulative Expenditures Through FY13	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
$250,000	$185,702.47	$1,004,519.49	$250,000	$265,000	$300,000	$300,000

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Start Date: FY07

Expected Duration: FY55

Long-term Goal: Post-development monitoring.

Conservation Measures: RASU6 and BONY5.

Location: Reaches 3-6 backwater habitats.

Purpose: Monitor fish use of habitat creation sites to provide data for the adaptive management process and develop management guidelines for created backwater habitats.

Connections with Other Work Tasks (past and future): All backwaters created in Section E. Work Task C23, C31, C33, C34, C40, and C41.

Project Description: This work will monitor the fish and fish habitat at conservation areas. It is anticipated that these sites will play various roles for 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, electro-fishing, 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 RASU and 2,000 large BONY (an additional 27,000 YOY BONY have also been released); a limited portion of each of these stockings were marked with PIT tags. Non-natives were identified shortly after the renovation efforts. Annual surveys have contacted subsets of each of these stockings, but long term survival has been low. Closer order monitoring via remote sensing was initiated in FY09 and continued through FY11. Populations of stocked RASU 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. Zooplankton collections were initiated in 2011and results show lower than average mean zooplankton biomass. Annual netting and electro-fishing surveys have been coordinated with the USFWS and have resulted in the capture of numerous RASU, as well as large numbers of non-natives. The majority of RASU contacted during survey events have been relocated to the Colorado River near Needles, California.

In 2012, stockings were discontinued at Beal Lake and fisheries surveys were reduced to a relative abundance and biomass estimate for all species with in the backwater. Results of this survey indicate that the backwater contains nearly 4,000 fish comprised of at least 6 different species. Common carp and largemouth bass comprise almost 90% of the total fish (69% and 20%, respectively), with carp occupying 88% of the total fish biomass. This level of non-natives is likely leading to a competition of resources and is consequently contributing to the low survival of native fish.

Routine monitoring of Big Bend Conservation Area is accomplished through monthly monitoring from February through May. This monitoring includes electro-fishing, trammel netting, and larval light trapping in areas dictated by water level and based on historical contacts of native fish. Water quality profiles were conducted during each monitoring trip and at least quarterly the remainder of the year. Previous monitoring continues to contact low numbers of RASU and FLSU. This includes larvae and sub-adults. Water quality has been exceptional, as was expected for a habitat with a direct connection to the river.

FY13 Accomplishments: Water quality at Beal Lake was monitored throughout the backwater using deployed continuous monitoring instruments. Low levels of DO and high temperatures were observed locally but not lake wide. Zooplankton and phytoplankton results continue to show relatively low levels of plankton biomass. Golden algae were confirmed following a fish kill in February, routine monthly monitoring of the algae has failed to detect it since May. Electro fishing and remote PIT scanning surveys failed to detect any fish following the toxic algae event. The total loss of fish resulted in an overall decrease in our monitoring effort for this site; this decrease in effort is also reflected in the budget FY13 budget summary.

Routine monitoring at Big Bend Conservation Area continued in FY13; native fish contacts included nine RASU and one FLSU. All of the razorbacks originated from localized stocking events from the past year. Larval FLSU were captured at rates similar to years past, and larval RASU were contacted at this site for the first time. Remote PIT scanners were deployed and successfully contacted RASU within the conservation area. Fish surveys at this location are highly influenced by river operations from Davis Dam. Water quality parameters remained with in thresholds for all native fish, and plankton abundance remained much lower than other sites.

FY14 Activities: Monitoring activities for Beal Lake will be focused on water quality and plankton, with a continued emphasis on golden algae.

Big Bend Conservation Area will be monitored at a level similar to FY13. In lieu of electro fishing, additional effort will be expended to deploy remote PIT scanners during routine monitoring. Water quality monitoring will continue, however, zooplankton monitoring will be discontinued.

Proposed FY15 Activities: The activities from FY14 will continue into this year. Recommendations for management guidelines and future outbreaks of golden algae at Beal Lake will dictate future monitoring and research objectives for the site. A drawn down of Beal Lake is planned for FY15. This management action will be employed to induce surface and groundwater flow into the lake to improve water quality and potentially reduce the likelihood of future golden algae outbreaks. The majority of the effort and expense for this management action will be captured under E1, however, additional monitoring is expected during and after the draw down event. The proposed budget for FY15 reflects this increased effort. Later-year budget increases are also expected as additional conservation areas are established. Big Bend Conservation Area activities will be similar to the previous year.

Pertinent Reports: A report titled, *Beal Lake Species Abundance and Biomass*, is completed and will be posted to the LCR MSCP website.