

Work Task E2: Beal Lake Native Fish

FY10 Estimates	FY10 Actual	Cumulative Accomplishment Through FY10	FY11 Approved Estimate	FY12 Proposed Estimate*	FY13 Proposed Estimate*	FY14 Proposed Estimate*
\$50,000	\$91,981.79	\$781,408.31	\$120,000	\$0	\$0	\$0

*Beginning in FY12 the E2 budget will be incorporated into the E1: Beal Lake Conservation Area work task.

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Start Date: FY05

Expected Duration: FY11

Long-term Goal: Habitat creation.

Conservation Measures: BONY2 and RASU2.

Location: Reach 3, Arizona, Havasu NWR, one-half mile east of River Mile 237.

Purpose: Reclamation maintains the backwater created for native fishes under the 1997 Biological Opinion (BO). Reclamation is simultaneously making improvements to the backwater and conducting restoration research at the site. Information from this research will be used to adaptively manage the backwater and increase efficiency and effectiveness in future backwater habitat creation projects.

Connections with Other Work Tasks (past and future): Monitoring of native fish is being addressed under F5. Portions of restoration research at Beal Lake are funded under G3. Starting in FY12, costs incurred for management of this Work Task will be tracked under Work Task E1: Beal Lake Conservation Area.

Project Description: Beal Lake was approximately 225 acres of shallow, low-quality aquatic habitat that was dredged beginning in 2001 to create a functioning backwater dedicated to native fish. The Beal Lake restoration project is a continuation of the commitment to construct habitat for protected native fish under the 1997 BO. Continued maintenance and management obligations of Beal Lake as well as research and development of the backwater as native fish habitat were assumed under the LCR MSCP in 2005.

Previous Activities: The costs of initial backwater creation, including dredging and isolating the backwater with a semi-permeable rock structure, were incurred prior to FY05 and implementation of the LCR MSCP. The restoration research and management of Beal Lake included the installation of a cylindrical wedge-wire screen system. Beal Lake was initially isolated from Topock Marsh with a passive rock filtration system. However, after several months the rock structure became clogged and an inadequate

volume of water was being transferred through the structure to compensate for the evaporative losses in Beal Lake. In response, Reclamation decided to test a new technology that would supplement water flow into the lake and effectively exclude life stages of nonnative fishes. A cylindrical wedge-wire screen system was selected because of its potentially easy maintenance and long-term performance.

Because cylindrical wedge-wire screen technology had never been used for this application, information was needed to estimate the hydraulic capacity of the system and its true exclusion capabilities. A two-phase investigation, including in situ hydraulic testing and a laboratory exclusion evaluation, was conducted and the reports are available on the LCR MSCP website.

A number of existing water control structures at Beal Lake were replaced during the screen system installation. The existing features were not adequately sized to supply the necessary volume of water to the irrigation pump or to Beal Lake.

Additional improvements were made to allow for more effective management of water in Beal Lake: a water management system enabling large-scale water removal, water level control for fisheries management, and large-scale water circulation capabilities was installed. The system consists of a permanent platform, ramp, and discharge pipe that allows for the intermittent deployment of various pumps, depending on the specific management need. The water management system was successfully used to assist the irrigation pump in lowering the water level in Beal Lake for lake renovation (this process included pre-treatment fish salvage, chemical treatment of the water to kill remaining nonnative fish, post-detoxification sampling, and restocking with native fish). In addition, the system can be used to circulate water from the south end of Beal Lake and induce freshening flows into the lake from Topock Marsh to maintain adequate levels of water quality for native fish.

FY10 Accomplishments: On-site activities included monthly cleaning of the wedge-wire screens, opening and closing of water control structures, calibration of water elevation sensors, and visual inspection of the backwater. These tasks were coordinated with on-site activities associated with Beal Lake Riparian Restoration (E1).

A 5-year evaluation of the rock structure screen system was conducted in November 2009. In addition to an intensive cleaning effort, a fourth set of screens were installed on a fourth pipe, which had been previously capped with blank flanges. Cleaning in conjunction with the installation of the fourth pair of screens was successful in providing the flow capacity necessary to transfer enough water through the system to allow for an equilibration of hydraulic head on either side of the rock structure for several months after the 5-year evaluation. A report was prepared and is posted on the MSCP website.

While a crew was mobilized on site for the system evaluation in November, access ports were installed on the three pipes that previously had no opening from which to sample the inside of the pipe, and the debris that had accumulated in the Beal Ditch was removed to increase flow through the canal.

Monitoring of the screen system's hydraulic performance continued through the temporary water level sensor system. Using additional funding made available from the closure of E3 ('Ahakhav Tribal Preserve), field data were collected to allow for the design and permitting for the water control structure, which was also completed this fiscal year.

Water quality instrumentation measuring temperature, turbidity, pH, dissolved oxygen, and conductivity were deployed at four locations of interest throughout Beal Lake in May 2010. The data gathered from these sensors will be used to establish a baseline for water quality and eventually provide a base of knowledge from which to make habitat management decisions.

FY11 Activities: Basic management activities such as monthly screen cleaning and pump maintenance will be performed. The temporary water level sensor system on site was replaced in January 2011 with a permanent gauging station. Annual operation and maintenance of the station, which entails data collection, calibration, and an annual report, will also be performed.

The water control structure within the Beal Ditch, which was redesigned in FY10, was replaced. The purpose of replacing the structure is to once again allow the embayment on the west side of the rock structure to be isolated and drawn down for maintenance purposes.

Water quality and fisheries monitoring activities will be coordinated with USFWS and are covered under F5. Coordination with resource agencies will continue to determine future operations and maintenance of existing features at Beal Lake.

Proposed FY12 Activities: In April 2010 the Steering Committee confirmed the Beal Lake Riparian Restoration site as a LCR MSCP Conservation Area to be managed for the remaining term of the program. The obligation to maintain the Beal Lake Native Fish site was assigned to Reclamation under the 1997 Biological Opinion and assumed under the LCR MSCP at its inception in 2005. Because the two sites are directly adjacent to one another and many of the maintenance activities already overlap, this work task will be closed in FY12 and the two sites will be incorporated into the E1 work task as the Beal Lake Conservation Area.

Pertinent Reports: *Evaluation of a Cylindrical Wedge-Wire Screen System at Beal Lake, Arizona, 2005*, and *Evaluation of a Cylindrical Wedge-Wire Screen System at Beal Lake, Arizona, 2006 Phase II Testing, Five-Year Evaluation of a Remote Screen System at Beal Lake, Arizona* are posted on the LCR MSCP website.