

## Work Task E1: Beal Lake Conservation Area

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$300,000	\$280,221.40	\$3,987,475.52	\$400,000	\$250,000	\$1,300,000	\$250,000

**Contact:** Laken Anderson, (702) 293-8153, [landerson@usbr.gov](mailto:landerson@usbr.gov)

**Start Date:** FY04

**Expected Duration:** FY55

**Long-Term Goal:** Habitat creation

**Conservation Measures:** WIFL1, WRBA2, WYBA3, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, MNSW2, MNSW2, BONY2, and RASU2

**Location:** Reach 3, Havasu National Wildlife Refuge, Arizona, 0.5 mile east of River Miles 238 and 239

**Purpose:** To create and manage a mosaic of native land cover types for LCR MSCP covered species

**Connections with Other Work Tasks (Past and Future):** Work Tasks E1 and E2 (closed) have been combined into the Beal Lake Conservation Area (BLCA). Vegetation and species monitoring are being addressed under Work Tasks F1–F4, and monitoring of native fishes is being addressed under Work Task F5. Portions of restoration research at the BLCA have been funded under Work Task G3.

**Project Description:** Beal Lake was 225 acres of shallow, low-quality aquatic habitat that was dredged in 2001 and stocked with native fishes. Management of Beal Lake is a continuation of the commitment to construct habitat for native fishes under the 1997 Biological and Conference Opinion. Continued maintenance and management obligations for the lake, as well as research and development of the backwater as native fish habitat, were subsumed under the LCR MSCP in 2005. Experimentation and restoration of the adjacent riparian area began in 2001. Three distinct planting efforts have been completed and resulted in 116 acres of various native land cover types, including cottonwood-willow, honey mesquite, and marsh. In 2010, the Beal Lake riparian (E1) and backwater (E2 [closed]) work tasks were combined when the Steering Committee formally adopted the work tasks as the Beal Lake Conservation Area.

The conservation area includes both the 225-acre backwater and 116 acres of cottonwood-willow, honey mesquite, and marsh.

### **Annual Maintenance and Management:**

*Riparian Fields:* Irrigation is provided to the riparian fields from March through mid-September using a diesel-driven pump and a series of alfalfa valves, which deliver water to individual cells. The system required onsite personnel to fuel, start, and maintain the pump as well as manually open and close the alfalfa valves. The marsh receives surface water from Topock Marsh through a gravity flow connection but can also be managed with the diesel-driven pump. Access roads through the conservation area are bladed and maintained with type-2 road base.

*Beal Lake:* Maintenance and manual cleaning of the screens that allow surface flows to move from Topock Marsh into Beal Lake occurs biweekly from March to mid-September. Water surface elevations within Beal Lake and Topock Marsh are monitored using the established gauging stations, which can be accessed remotely. A series of water control structures, which has been installed to allow connection to or isolation of Beal Lake from Topock Marsh, requires annual maintenance. Using these structures, the lake can also be drawn down for fisheries or salinity management, using either a dewatering system installed at the south end of the lake or the diesel-driven pump.

### **Previous Activities:**

*Riparian Fields:* The riparian area has been irrigated and managed since 2001.

*Beal Lake:* Previous native fish stockings have maintained a population of approximately 100 razorback suckers. However, golden algae were confirmed within Beal Lake following a fishkill in February 2013. There were no detections of any fishes using electrofishing or remote passive integrated transponder scanning surveys for several months following the toxic algae event. By mid-summer, young-of-year largemouth bass were observed in the backwater. The backwater was hydrologically isolated from Topock Marsh following the fishkill; this closure resulted in a rapid increase in specific conductivity, which approached 11,000 microsiemens per centimeter in FY14. Since 2013, native fishes have not been contacted in the lake, and native fish stockings have not yet resumed. The lake is monitored monthly, and no algae have been detected since May 2013.

## **FY15 Accomplishments:**

### **Maintenance/Restoration/Management:**

*Riparian Fields:* Using the diesel-driven pump, 907 acre-feet of water was delivered to the 116 acres of cottonwood-willow.

In April 2015, there was a possible sighting of a northern Mexican gartersnake within the BLCA along the maintenance road between cells N and EE. Five photographs were provided for identification. There was a second observation on May 4, 2015, in the same area, and two photographs were provided for identification. The gartersnake is not an LCR MSCP covered species but was listed as threatened under the Endangered Species Act in July 2014. On June 9, 2015, an informal consultation was initiated under the LCR MSCP for maintenance activities occurring at the Beal Lake Conservation Area that may affect the northern Mexican gartersnake.

*Beal Lake:* Water surface levels were monitored using the established gauging stations. A discrepancy between the U.S. Fish and Wildlife Service gage at the South Dike and the gage in Topock Marsh adjacent to Beal Lake was noted. An informal survey of the staff gages was conducted in May 2015 to identify the source of the discrepancy.

Clearing of the unlined inlet ditch, which connects Topock Marsh to Beal Lake, was conducted and took 3 weeks to complete. Cattails were removed from the ditch using an excavator, placing the material in the dredge spoil field directly south of the ditch. This activity enhanced surface water flows; however, deepening of the channel in conjunction with other site improvements would minimize future long-term maintenance costs. Both the northern and southern boat ramps were cleared of vegetation and graded for ease of launching boats during monitoring efforts. The southern boat ramp was lined with riprap.

### **Monitoring:**

*Riparian Fields:* Monitoring was conducted at the BLCA for vegetation, birds, bats, small mammals, and MacNeill's sootywings.

Vegetation data were collected in FY15 using light detection and ranging (LiDAR) remote sensing techniques.

Marsh bird surveys were conducted on three occasions at the wetland portions of the site. Western least bitterns and Yuma clapper rails were detected and are presumed to be breeding at the site.

Riparian bird surveys were conducted at the BLCA from April 15 to June 15, 2015, using the LCR MSCP's double sampling protocol. Arizona Bell's vireos,

Sonoran yellow warblers, and summer tanagers were confirmed breeding. Avian mist netting following the Monitoring Avian Productivity and Survivorship (MAPS) protocol was conducted from early May to early August. Sonoran yellow warblers, Arizona Bell's vireos, and summer tanagers were captured. Southwestern willow flycatcher surveys were conducted. One willow flycatcher was detected at the site on June 24; since no breeding evidence was observed and the bird was not observed after this visit, it is assumed this individual was a migrant. Yellow-billed cuckoo surveys were conducted between late June and early August, and breeding was confirmed.

The BLCA was mist netted for bats once per month from May to September 2015. California leaf-nosed and Townsend's big-eared bats were captured. In conjunction with the bat capture surveys, the established long-term acoustic bat station was used to detect LCR MSCP bat species. Western red bats, western yellow bats, California leaf-nosed bats, and Townsend's big-eared bats were detected during acoustic surveys.

Small mammal trapping was conducted in spring. No cotton rats were detected, but desert pocket mice were captured.

Surveys were conducted for MacNeill's sootywings in 2015. Individuals were detected in May.

*Beal Lake:* 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 decreased to nearly 6,000 microsiemens per centimeter once the backwater was reconnected to Topock Marsh and the inlet canal was cleared to allow for better water flow. 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.

#### **FY16 Activities:**

#### **Maintenance/Restoration/Management:**

*Riparian Fields:* Continued irrigation of the riparian fields will be conducted from March through September. No construction, restoration, or new management activities are planned within the riparian fields of the BLCA.

*Beal Lake:* Maintenance and manual cleaning of the screens that allow surface flows to move from Topock Marsh into Beal Lake will be conducted. Permanent removal of the four downstream wedge wire screens on the rock structure will be performed in March. A cage to exclude small mammals will be installed on the downstream end of the culverts, and clean screens will be reconnected on the upstream side of the culverts. Beginning in 2016, an annual maintenance

schedule will be managed for the four upstream wedge wire screens along the rock structure. The screens will be removed and replaced with clean screens. The removed screens will be pressure washed and stored until the next year when the cycle repeats to help induce flow to Beal Lake.

A drawdown of Beal Lake is scheduled, and any change in salinity will be tracked. Water levels will continue to be monitored using the established gauging stations. A formal survey will be conducted to confirm accuracy and the source of the discrepancy of the instruments adjacent to Beal Lake and the U.S. Fish and Wildlife Service gage located at the South Dike.

### **Monitoring:**

*Riparian Fields:* Vegetation data will be collected in May 2016 using LiDAR remote sensing techniques. Marsh bird surveys will be conducted in March and April. General bird surveys and MAPS bird banding will be conducted from mid-April to mid-June. Single species surveys for southwestern willow flycatchers and yellow-billed cuckoos will be conducted during their respective breeding seasons. Bat capture surveys and acoustic monitoring will be conducted during summer. Small mammal monitoring will be conducted in fall and spring.

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

### **Proposed FY17 Activities:**

#### **Maintenance/Restoration/Management:**

*Riparian Fields:* Riparian fields will be irrigated from March through September. No construction, restoration, or new management activities are planned within the riparian fields of the BLCA.

*Beal Lake:* Maintenance, cleaning, and rotation of the wedge wire screens within the unlined ditch are anticipated. Beginning in FY17, permitting and environmental compliance for the proposed dredging of Beal Lake is expected to begin. The dredging will help provide deeper areas within the lake for native fishes to seek thermal refuge and escape from predation. When dredged in 2001, the depth of the dredge channels was approximately 6 feet. Coordination and concepts will be agreed upon with partners and presented to the Steering Committee through the work plan process. Dredge material quantities will be verified, and the location of the spoil piles will be determined after coordinating with staff at the Havasu National Wildlife Refuge.

**Monitoring:**

*Riparian Fields:* Information from LiDAR vegetation data collected during FY15 and/or FY16 will be used to determine the schedule for vegetation monitoring data collection for FY17 and beyond. Marsh bird surveys will be conducted in March and April. General bird surveys and MAPS bird banding will be conducted from mid-April to mid-June. Single species surveys for southwestern willow flycatchers and yellow-billed cuckoos will be conducted during their respective breeding seasons. Bat capture surveys and acoustic monitoring will be conducted during summer. Small mammal monitoring will be conducted in fall and spring.

*Beal Lake:* The activities from FY16 will continue into this year, and research projects outlined in FY16 will be initiated.

**Pertinent Reports:** The *2015 Beal Lake Conservation Area Annual Report*, will be posted on the LCR MSCP Web site once integration of the data collected throughout the calendar year is complete.