

## Work Task E1: Beal Lake Conservation Area

FY16 Estimate	FY16 Actual Obligations	Cumulative Expenditures Through FY16	FY17 Approved Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate	FY20 Proposed Estimate
\$400,000	\$209,035.87	\$4,195,989.41	\$250,000	\$250,000	\$250,000	\$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:** BEVI1, BONY2, ELOW1, GIFL1, GIWO1, MNSW2, MNSW2, RASU2, SUTA1, VEFL1, WIFL1, WRBA2, WYBA3, YBCU1, and YWAR1

**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 Section F work tasks. 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 the 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 by 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 the cottonwood-willow (*Populus fremontii-Salix gooddingii*) cover type. 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 habitat, including a mosaic of cottonwood-willow, honey mesquite (*Prosopis glandulosa*), and marsh.

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

*Riparian:* 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 requires 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:* 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 (*Xyrauchen texanus*). 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 (*Micropterus salmoides*) 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.

## **FY16 Accomplishments:**

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

*Riparian:* In FY16, 964 acre-feet of water was delivered to the BLCA (116 acres). In February 2016, the 9 acres of willow marsh was flooded and flushed to manage salinity.

*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. A survey of the staff gages in the vicinity was conducted in coordination with the Bureau of Reclamation's river operations to identify the source of the discrepancy in water surface elevations noted in December 2016. The Bureau of Reclamation is now resolving the discrepancy and determining how to properly deliver staff gage data in the future.

A drawdown of Beal Lake was conducted in February 2016, and the salinity was monitored. The drawdown was completed using the existing pump stand, which eliminated the need to bring in a large portable pump, which in return reduced obligations. During the drawdown, all eight wedge wire screens on the Beal Lake rock structure were removed and cleaned, and four were reinstalled on the upstream side. A cage to exclude small mammals was installed on the end of the culverts in the rock structure, and clean screens were reconnected on the upstream (Topock Marsh) side of the culverts. Only having screens on the upstream side and the new maintenance strategy has resulted in an almost 1-foot increase in water surface of Beal Lake.

### **Monitoring:**

*Riparian:* Monitoring was conducted at the BLCA for vegetation, birds, bats, small mammals, and MacNeill's sootywing skippers (*Pholisora graciellae* = *Hesperopsis graciellae* [MacNeill]).

Vegetation data were collected in FY16 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 (*Ixobrychus exilis hesperis*) and Yuma clapper rails (*Rallus longirostris yumanensis* [also known as Yuma Ridgway's rail = *R. obsoletus yumanensis*]) 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, 2016, using the LCR MSCP's double sampling protocol. Arizona Bell's vireos

(*Vireo bellii arizonae*), Sonoran yellow warblers (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*), and summer tanagers (*Piranga rubra*) were confirmed breeding. Avian mist netting following the Monitoring Avian Productivity and Survivorship (MAPS) protocol was conducted from early May to early August. Arizona Bell's vireos, Sonoran yellow warblers, and summer tanagers were captured and color banded. In addition, Arizona Bell's vireos, Sonoran yellow warblers, and summer tanagers were resighted. Southwestern willow flycatcher (*Empidonax traillii extimus*) surveys were conducted, and no resident or breeding individuals were detected. Yellow-billed cuckoo (*Coccyzus americanus occidentalis*) surveys were conducted between late June and early August. Yellow-billed cuckoos were detected, and breeding was probable.

The BLCA was mist netted for bats once per month from June to August. California leaf-nosed bats (*Macrotus californicus*) and pale Townsend's big-eared bats (*Corynorhinus townsendii pallescens* = *Plecotus townsendii pallescens* = *C. townsendii townsendii*) were captured. A long-term acoustic bat station was used in order to record data on LCR MSCP bat species. These data will be analyzed in FY17.

Small mammal trapping was conducted in fall and spring. No Colorado River cotton rats (*Sigmodon arizonae plenus*) were detected, but desert pocket mice (*Chaetodipus penicillatus*) were captured (possibly the *sobrinus* subspecies).

Surveys were conducted for MacNeill's sootywing skippers (*Pholisora graciellae* = *Hesperopsis graciellae* [MacNeill]) and presence was confirmed.

*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 has decreased to nearly 2,200 microsiemens per centimeter following screen maintenance. 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. No fish activities were conducted at Beal Lake due to the lack of native fishes in the ponds since 2013.

## **FY17 Activities:**

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

*Riparian:* 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:* In February 2017, the wedge wire screens along the rock structure were removed and replaced with clean screens to improve water flow into Beal Lake. This activity will be conducted annually.

**Monitoring:**

*Riparian Fields:* Vegetation data will be collected using LiDAR remote sensing techniques. Marsh bird surveys will be conducted in March, April, and May. General bird surveys will be conducted from April to 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 research related to the interactions of native and non-native fish species. Areas of the backwater will be partitioned and stocked with equal numbers of razorback suckers; one-half of the partitioned areas will have non-native fishes removed, and the other half will not. Short-term survival will be monitored using remote passive integrated transponder scanners. Golden algae sampling will continue in spring when conditions are the most favorable for the algae.

**Proposed FY18 Activities:****Maintenance/Restoration/Management:**

*Riparian:* 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 FY18, 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. Dredge material quantities will be verified, and the location of the spoil piles will be determined after coordinating with the Havasu National Wildlife Refuge. Dredging will be delayed.

**Monitoring:**

*Riparian:* Information from LiDAR vegetation data collected during FY14–17 will be used to determine the schedule for vegetation monitoring data collection for FY18 and beyond. Marsh bird surveys will be conducted in March, April, and May. General bird surveys will be conducted from April to June. Single species surveys for southwestern willow flycatchers and yellow-billed cuckoos will be conducted during their respective breeding seasons. Bat monitoring will be conducted during summer. Small mammal monitoring will be conducted in fall and spring.

*Beal Lake:* The activities from FY17 will continue into this year. Native fish research projects at Beal Lake will be identified and initiated. Research may continue to focus on the interactions with non-native fishes or the impact of piscivorous bird predation in the lake.

**Pertinent Reports:** The *2016 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.