

## Work Task E1: Beal Lake Conservation Area

FY14 Estimate*	FY14 Actual Obligations*	Cumulative Expenditures Through FY14*	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$300,000	\$130,785.45	\$3,714,737.03	\$300,000	\$400,000	\$200,000	\$200,000

\* Includes Work Task E2 (closed).

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**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 NWR, 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):** With the concurrence of the Steering Committee, Work Tasks E1 and E2 (closed) have been combined into the BLCA. Vegetation and species monitoring are being addressed under Work Tasks F1–F4, and monitoring of native fish 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 to create a functioning backwater dedicated to native fish. Management of Beal Lake 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 subsumed under the LCR MSCP in 2005.

The development of the riparian area within the BLCA was initiated to research effective ways of using dredge material. The plan called for blending sediment dredged from Beal Lake with adjacent soils and replanting the mixed substrate with native vegetation. The project area, which is divided into fields that can be

independently irrigated and managed, was designed to provide a location for testing various riparian restoration methods and techniques for site preparation, planting, irrigation, monitoring, and management.

**Previous Activities:** Post-development habitat and avian monitoring have been conducted since FY04. Monitoring of post-development microclimate, small mammals, and bats has been conducted since FY06.

Experimentation and restoration of the Riparian Area began in 2001. Three distinct planting efforts have been completed and resulted in 107 acres of various native land cover types, including cottonwood-willow, honey mesquite, and marsh. Phase 1 (61 acres) and Phase 2 (44 acres) consist of riparian trees, whereas the southwestern willow flycatcher marsh (13 acres) was created as marsh.

The backwater was dredged in 2001. In 2012, native fish stockings were discontinued at Beal Lake, and fisheries surveys were reduced to a relative abundance and biomass estimate for all species within the backwater. The results of these surveys indicated that the backwater contained nearly 4,000 fish comprised of at least 6 different species. Common carp and largemouth bass comprised 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 for resources and, at least, is contributing to the poor survival of native fish.

Golden algae were confirmed following a fish kill in February 2013, and routine monthly monitoring of the algae has failed to detect it since May 2013. Electrofishing and remote PIT scanning surveys failed to detect any fish for several months following the toxic algae event. By mid-summer, young-of-year largemouth bass were observed in the backwater.

## **FY14 Accomplishments:**

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

*Riparian Fields:* Irrigation was conducted on the riparian fields from mid-March through mid-September using a diesel-driven pump, which delivered water to each individual field through an alfalfa valve. The system required onsite personnel to fuel, start, and maintain the pump as well as manually open and close the alfalfa valves. The diesel engine had reached a major maintenance interval and was removed, rebuilt, and reinstalled during the fiscal year.

No construction activities were planned within the riparian fields of the BLCA during FY14. However, in April 2014, one of the four Topock Marsh/Beal Lake canal irrigation gates required repair.

Repairs of irrigation Cell KK, needed due to a breach/blowout of the irrigation berm/border, were completed in August 2014. The berm was repaired, and the interior of the cell was graded to remove large sand drifts that hindered consistent irrigation. The repairs were successful, and the flood irrigation water is now reaching the full extent of the irrigation cell.

*Beal Lake:* Maintenance and manual cleaning of the screens that allow surface flows to move from Topock Marsh into Beal Lake will not be conducted due to the presence of golden algae. Water levels will continue to be monitored using the established gauging stations.

In cooperation with the USFWS, the long-term role of Beal Lake, given its past performance and the presence of golden algae, has been discussed although no decision has been made. The outcome will determine the level of effort required in future years. As a result no additional construction or restoration activities were conducted for Beal Lake during FY14, and expenditures were less than anticipated. Future budgets may be modified depending on the outcome of discussions with the USFWS.

#### **Monitoring:**

*Riparian Fields:* Vegetation monitoring was conducted between September and November 2014.

Small mammal monitoring was conducted in Field F in the fall and spring. No cotton rats were detected. One desert pocket mouse was captured in the fall and one in the spring.

Bat capture surveys were conducted at the site once per month in May, June, July, and August. Both LCR MSCP evaluation species were captured, including one Townsend's big-eared bat and two California leaf-nosed bats. In conjunction with the bat capture surveys, the established long-term acoustic bat station continuously collected acoustic bat data. Western red bats, western yellow bats, California leaf-nosed bats, and Townsend's big-eared bats were detected during acoustic surveys.

General avian surveys were conducted using intensive and rapid area search protocols. A total of 102 pairs of riparian birds were estimated to be breeding at the BLCA. Arizona Bell's vireo (13 territories), Sonoran yellow warbler (8 territories), and summer tanager (2 territories) were confirmed breeding.

Single species surveys were conducted for the southwestern willow flycatcher and western yellow-billed cuckoo during their respective breeding seasons. Western

yellow-billed cuckoo were detected on four of the five visits. There was one probable territory at the site. One willow flycatcher was using the site from May to June 2 but was not detected after that date.

Avian mist netting following the MAPS protocol (D5) was conducted from early May to early August. Sonoran yellow warbler, Arizona Bell's vireo, and summer tanager were color banded to better monitor their breeding activities at the riparian fields.

Three marsh bird survey points were established at the willow marsh and nine points were established at the existing lake. Marsh bird surveys were conducted according to the National Marsh Bird Monitoring protocol. There were four detections of Yuma clapper rail at the existing lake. There were seven detections of least bitterns at the existing lake and six detections at the willow marsh.

*Beal Lake:* The water quality at Beal Lake was monitored throughout the backwater; 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.

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. No golden algae have been detected in Beal Lake since May 2013. Limited electrofishing and netting surveys in FY14 detected 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.

### **FY15 Activities:**

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

*Riparian Fields:* Irrigation and possible fertilization is projected on the riparian fields from mid-March through mid-September using a diesel-driven pump, which delivers water to each individual field through an alfalfa valve. The system requires onsite personnel to fuel, start, and maintain the pump as well as manually open and close the alfalfa valves.

*Beal Lake:* Maintenance and manual cleaning of the screens that allow surface flows to move from Topock Marsh into Beal Lake will be conducted in FY15. Water levels will continue to be monitored using the established gauging stations. Clearing of the unlined inlet canal, which connects Topock Marsh to Beal Lake, is anticipated.

**Monitoring:**

*Riparian Fields:* Vegetation monitoring will continue. Small mammal monitoring will be conducted in the fall and spring. Bat capture surveys will be conducted from May to September. An established long-term bat monitoring station will be used to collect acoustic data. General bird surveys will be conducted from mid-April to mid-June. Single species surveys for the southwestern willow flycatcher and yellow-billed cuckoo will be conducted during their respective breeding seasons. Marsh bird surveys will be conducted in the willow marsh and existing lake in March, April, and May. MacNeill's sootywing surveys will be conducted in the spring and summer.

*Beal Lake:* The activities from FY14 will continue into this year. A drawdown to exchange water from Beal Lake, originally scheduled for FY15, was delayed to allow discussion with the USFWS on the presence of golden algae. Salinity levels within the lake are monitored and have been increasing over time. The drawdown would be initiated to lower salinity levels in the backwater and facilitate fisheries management. Recommendations for management guidelines and future outbreaks of golden algae at Beal Lake will dictate future monitoring and research objectives for the site.

**Proposed FY16 Activities:****Maintenance/Restoration/Management:**

*Riparian Fields:* Irrigation and fertilization is projected on the riparian fields from mid-March through mid-September using a diesel-driven pump, which delivers water to each individual field through an alfalfa valve. The system requires onsite personnel to fuel, start, and maintain the pump as well as manually open and close the alfalfa valves. No construction activities are planned within the riparian fields of the BLCA during FY16.

*Beal Lake:* Maintenance and manual cleaning of the screens that allow surface flows to move from Topock Marsh into Beal Lake will be conducted in FY16. Water levels will continue to be monitored using the established gauging stations. A drawdown to exchange water from Beal Lake, originally scheduled for FY15, is anticipated in FY16. Salinity levels within the lake are monitored and have been increasing over time. The drawdown would be initiated to lower salinity levels in the backwater and facilitate fisheries management.

No other construction or restoration activities are planned for Beal Lake during FY16.

**Monitoring:**

*Riparian Fields:* Vegetation monitoring will continue. Small mammal monitoring will be conducted in the spring and fall. Bat capture surveys will be conducted from May to September. An established long-term bat monitoring station will be used to collect acoustic data. General avian surveys will be conducted from mid-April to mid-June. Single species surveys for the southwestern willow flycatcher and yellow-billed cuckoo will be conducted during their respective breeding seasons. Surveys for marsh birds will be conducted within the willow marsh and existing lake. MacNeill's sootywing surveys will be conducted in the spring and summer.

*Beal Lake:* The activities from FY15 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.

**Pertinent Reports:** The report titled *Beal Lake Restoration Site Amendment Study: Irrigation Monitoring and Instrumentation Report, 2012* will be posted on the LCR MSCP Web site upon completion. The *2013 Beal Lake Conservation Area Annual Report*, which summarizes any planting conducted, site management, the results of monitoring, and any recommendations for future adaptive management, will be posted once integration of the data collected throughout the calendar year is complete.