Work Task E1: Beal Lake Conservation Area

FY13 Estimate*	FY13 Actual Obligations*	Cumulative Expenditures Through FY13*	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
$300,000	$194,295.82	$3,573,886.28	$300,000	$300,000	$200,000	$200,000

*Includes E2.

Contact: Darrin Miller, (702) 293-8166, dmiller@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, CLNB2, PTBB2, MNSW2, BONY2 and RASU2.

Location: Reach 3, Havasu NWR, Arizona, 0.5 miles east of river miles 238 and 239.

Purpose: 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 have been combined into the Beal Lake Conservation Area. Vegetation and species monitoring are being addressed under F1-F4. Monitoring of native fish is being addressed under F5. Portions of restoration research at Beal Lake have been funded under 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 Biological Opinion. 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.

The development of the Riparian Area within the Beal Lake Conservation Area 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 has been conducted since FY04. Monitoring of post-development microclimate, small mammals, and bats has been conducted since FY06.

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 with in the backwater. Results of this survey indicate that the backwater contains nearly 4,000 fish comprised of at least six 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 at least is contributing to the poor survival of native fish.

FY13 Accomplishments:

Maintenance/Restoration/Management.
Riparian Fields. Management through irrigation and fertilization was conducted on the riparian fields from mid-March through mid-September. Irrigation for the 107 acres is provided using a diesel driven pump, which delivers water to each individual field through a series of alfalfa valves. They system requires on-site 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 was discontinued in FY13 due to the presence of Golden Algae. Beal Lake water levels were monitored with the established gaging stations. The gauging stations were maintained and calibrated which provides an online source of water surface elevations.

Maintenance of the newly created willow-marsh was less than projected and therefore, expenditures in FY13 were less than anticipated. Future budget projections have been reduced to reflect expected costs; however other costs such as the overhaul of the diesel engine and drawdown of the lake are anticipated to be incurred in FY14 and FY15.

Monitoring.
Riparian Fields. Vegetation monitoring for FY13 was conducted between September and December 2013. Thirty-five plots were surveyed at full intensity and were located in 17 fields within the riparian area.

Small mammal monitoring was conducted in a portion of the riparian fields in the fall and spring. One sub adult Colorado River cotton rat was captured in the fall in field F and no LCR MSCP species were detected in the spring.

Exploratory bat capture surveys were conducted for the second year to determine the feasibility of making the riparian fields a long term capture site. The Townsend's big-eared bat was the only LCR MSCP species captured. Surveys were conducted once per month in May, June, July, August, and September. In conjunction with the bat capture surveys, the established long-term acoustic bat station continuously collects acoustic bat data.

General avian surveys were conducted using intensive and rapid area search surveys. Four area search plots were surveyed. Arizona Bell's vireo (13 territories), Sonoran yellow warbler (20 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.

Yellow-billed cuckoos were detected on four of the five visits. There was one confirmed territory and one possible territory breeding at the site.

The riparian fields were surveyed five separate times for willow flycatchers. One migrant willow flycatchers for which residency could not be determined was detected on June 10.

Avian mist netting following the Monitoring Avian Productivity and Survivorship protocol (D5) was conducted from early May to early August. Sonoran yellow warblers, Arizona Bell's vireos, and summer tanagers were color banded to better monitor their breeding activities at the riparian fields.

Three marsh bird survey points were established at the constructed wetlands. Marsh bird surveys were conducted at the three points in March and April using the National Marsh Bird Monitoring Protocol. No LCR MSCP species were detected.

Irrigation, soil moisture and vegetation data were collected on the experimental fields in the Lassenite Pozzolan study throughout the year (C42). Vegetation monitoring results showed that willow seed germination was not significantly improved by high percentages of Lassenite added to the soils. However, the data does show that soil surface moisture between irrigation events is retained longer between irrigations in plots with at least 25% of Lassenite. Monitoring of willows in the Lassenite Pozzolan study was discontinued after FY13 due to poor willow establishment on the experimental fields.

Beal Lake. 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. Golden algae were confirmed following a fish kill in February, and 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.

FY14 Activities:

Maintenance/Restoration/Management.
Riparian Fields. Management through irrigation and fertilization is projected on the riparian fields from mid-March through mid-September. Irrigation for the 107 acres is provided using a diesel driven pump, which delivers water to each individual field through an alfalfa valve. The system requires on-site personnel to fuel, start, and maintain the pump as well as manually open and close the alfalfa valves. The diesel engine that drives the pump has reached a major maintenance interval and will be removed and rebuilt during the fiscal year.

No construction activities are planned within the riparian fields of the Beal Lake Conservation Area during FY14.

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 with the established gaging stations.

No construction or restoration activities are planned for Beal Lake during FY14.

Monitoring.
Riparian Fields. Vegetation monitoring for FY14 will be conducted between October and December 2014. Small mammal monitoring will be conducted in the fall and spring. The third year of bat capture surveys will be conducted from May to September. An established long term bat monitoring station will continuously collect acoustic data. General avian surveys using intensive and rapid area search 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 constructed wetlands in March, April, and May.

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

Proposed FY15 Activities:

Maintenance/Restoration/Management.
Riparian Fields. Management through irrigation and fertilization is projected on the riparian fields from mid-March through mid-September. Irrigation for the 107 acres is provided using a diesel driven pump, which delivers water to each individual field through an alfalfa valve. The system requires on-site 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 Beal Lake Conservation Area during FY15.

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 with the established gaging stations. A drawdown to exchange water from Beal Lake is anticipated. Salinity levels within the lake are monitored have been increasing over time. The drawdown is being initiated to lower salinity levels in the backwater and facilitate fisheries management.

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 utilizing intensive and rapid area search 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 constructed wetlands.

Beal Lake. 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.

Pertinent Reports: *Beal Lake Restoration Site Amendment Study: Irrigation Monitoring and Instrumentation Report 2012* will be posted to the website. The *2012 Beal Lake Conservation Area Annual Report*, which summarizes any planting conducted, site management, results of monitoring, and any recommendations for future adaptive management will be posted after integration of data collected throughout the calendar year.