

Work Task E1: Beal Lake Conservation Area

FY12 Estimate*	FY12 Actual Obligations*	Cumulative Expenditures Through FY12*	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
\$950,000	\$916,195.79	\$4,080,857.71	\$300,000	\$300,000	\$300,000	\$300,000

*Includes E2

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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, BEV11, YWAR1, FUTA1, 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. The Beal Lake restoration project 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 Beal Lake Riparian 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. At the end of the 2011 monitoring season, the Beal Lake Conservation Area had nesting pairs of Sonoran yellow warbler, Arizona Bell's vireo, summer tanager, and yellow-billed cuckoo. The riparian restoration site currently provides approximately 107 acres of cottonwood, willow, and mesquite habitats, as well as contributes valuable information about restoration techniques and management practices.

FY12 Accomplishments:

Maintenance/Restoration/Management.

Riparian Fields. Clearing, grubbing, and contouring of the 14 acre willow-marsh site was finished in January 2012. In addition to the earthwork, two culverts were installed to allow for water management within the marsh area. The acreage was planted in March 2012 with bulrush and salt grass in the marsh cell and Goodding's and coyote willow in the riparian field. Cattails and cottonwoods have both voluntarily established on site.

Two distinct actions utilizing Lassenite Pozzolan are being conducted within the riparian fields at the Beal Lake Conservation Area. The first effort cleared two fields, which were cleared during the willow-marsh construction effort. The fields were used to demonstrate the feasibility of using the soil amendment. One field was left as a control while the other was treated with Lassenite Pozzolan per the company's instructions. The demonstration was conducted to determine if the product could significantly increase irrigation efficiency, as well as increase the retention of moisture within the soil. Based on the results of the field scale trial, no significant difference was found between the field treated with Lassenite Pozzolan and the control. The second action is a research project described in C42. In FY12 the final Lassenite Pozzolan study plan and experimental design was completed for the study. Willow seeds were collected from trees along the LCR and stored for use. All permits were obtained. Fields J and E were cleared of all existing vegetation. Deep pot cottonwood trees were planted around the perimeter of experimental fields to provide a wind break.

Irrigation, maintenance, and on-site management were conducted on the riparian fields from mid-March through mid-September. A combination of Nitrogen, Phosphorus and Manganese fertilizers were applied via the fertigation system.

Beal Lake. A second gaging station was installed to monitor the water surface elevation of Beal Lake at the west end of the Beal ditch. Data from previous years had misrepresented true lake elevations due to blockages in the ditch, which delivers surface water to the lake. The data collected from this station allowed comparison of elevations of Beal Lake to those recorded at the embayment on the west side of the rock structure to determine if the inlet ditch was functioning, as well as monitor the true water surface elevation of the lake.

Monitoring.

Riparian Fields. Post-development vegetation monitoring was conducted in 17 fields. Thirty-five intensive plots were evaluated for density, vegetation structure and community composition.

A study of phosphorous content in insects was completed at the site. Results indicate that certain arthropods contain more phosphorus than others and may provide better nutrition for insectivorous bird.

Small mammal monitoring was conducted in a portion of the Conservation Area in the fall (November) and spring (March); two CRCR were detected. One sub adult female was captured in the fall and one adult male was captured in the spring.

Exploratory bat capture surveys determined that it was feasible to make the riparian fields of the Beal Lake Conservation Area a long-term capture site. Surveys were conducted once per month in May, July, and September. The California leaf-nosed bat was the only LCR MSCP covered species captured. In conjunction with the bat capture surveys, the long-term acoustic bat station continuously collects acoustic bat data. A 40-foot tall pole was installed on the bat station to increase the height of the microphone to reduce insect noise.

General avian surveys were conducted using intensive and rapid area search surveys. Four area search plots were established. Bell's vireo (13 territories), yellow warbler (9 territories) and summer tanager (1 territory) 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 two of the five visits. One bird was detected on June 24 and two birds were detected on July 5. Yellow-billed cuckoos were not confirmed nesting at the site. The riparian fields were surveyed five separate times for willow flycatchers. One territorial southwestern willow flycatcher was detected at Beal Lake that had in previous years held a territory in the Pipes #3 site, which is located north of Beal Lake adjacent to Topock Marsh. Three willow flycatchers for which residency could not be determined were detected April 23 and May 16.

Avian mist netting following the Monitoring Avian Productivity and Survivorship protocol (D5) was conducted from 29 April to 9 August. Sonoran yellow warblers, Arizona Bell's vireos, and summer tanagers were color banded to better monitor their breeding activities at the site.

Beal Lake. RASU stocking was discontinued at Beal Lake due to poor survival, and fisheries surveys were reduced to a relative abundance and biomass estimate for all species within the backwater. Results of this survey indicate that the backwater contains nearly 4,000 individual fish and at least 6 different species. Common carp and largemouth bass comprise almost 90% of the total fish numbers (69% and 20% respectively), with carp comprising 88% of the total fish biomass. This level of non-

natives is likely leading to a competition of resources and at least contributing to the poor survival of native fish. Water quality was constantly monitored throughout the backwater; low levels of DO and high temperatures were observed locally but not lake wide. Zooplankton and phytoplankton sampling was increased in FY12, and results continue to be analyzed.

Nine marsh bird stations were surveyed at Beal Lake. During the three visits to each of the stations, 3 Yuma clapper rails and 26 least bitterns were detected. No black rails were detected in 2012.

FY13 Activities:

Maintenance/Restoration/Management.

Riparian Fields. No construction activities are planned within the riparian fields of the Beal Lake Conservation Area during FY13. However, the perimeter of one field will be planted with salt grass to reduce salt cedar from establishing along the edges. Two fields will be used in a soil amendment study investigating if Lassenite Pozzolan on germination, survival, and growth of willow habitat planted from seed. This research is funded and documented under work task C42.

Irrigation and maintenance will continue, however, a reduced irrigation schedule will be implemented for FY13. The water level of the marsh cell constructed in FY12 will passively rise and fall with Topock Marsh via the culvert that provides a surface water connection between the two.

Beal Lake. No construction or major restoration activities are planned for Beal Lake during FY13.

The gauging stations continue to be maintained and calibrated by Reclamation's Hydrographic Office in Blythe, California.

Monitoring.

Riparian Fields. Post-development vegetation monitoring will be conducted in 17 fields. Thirty-five intensive plots will be evaluated for density, vegetation structure and community composition. Small mammal monitoring will be conducted annually. The second year of exploratory bat capture surveys will be conducted. An already 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. Irrigation, soil moisture and vegetation data will begin to be collected on the experimental fields in the Lassenite Pozzolan study. Marsh bird surveys will be initiated in the newly constructed wetlands.

Beal Lake. Monitoring activities for Beal Lake will continue while long-term management guidelines are established. Water quality and plankton monitoring will continue, along with periodic remote sensing to track the existing small population of RASU. Specific research activities will be identified to address native fish life history questions, as well as site-specific management questions. Marsh bird surveys will be conducted at the nine established survey points.

Proposed FY14 Activities:

Maintenance/Restoration/Management.

Riparian Fields. Management through irrigation and fertilization will continue. 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 new activities are anticipated within the riparian fields of the Beal Lake Conservation Area during FY14.

Beal Lake. No construction or major restoration activities are planned for Beal Lake during FY14. The water level of Beal Lake is maintained through surface water deliveries from Topock Marsh as well as some upwelling of groundwater. Surface water enters the lake from Topock Marsh through 8 wedge-wire screens and seepage through the semi-permeable rock structure. Maintenance and manual cleaning of the screens is conducted on a regular basis throughout the year.

Monitoring.

Riparian Fields. Vegetation monitoring will continue at previously established plot locations. Small mammal monitoring will be conducted annually. An already 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. Irrigation, soil moisture and vegetation data will continue to be collected on the experimental fields in the Lassenite Pozzolan study. Surveys for marsh birds will be conducted within the constructed wetlands.

Beal Lake. Recommendations for management guidelines at Beal Lake will dictate future monitoring and research objectives for the site. Marsh bird surveys will be conducted at the nine established survey points.

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.