

Work Task E1: Beal Lake Conservation Area

FY10 Estimates	FY10 Actual	Cumulative Accomplishment Through FY10	FY11 Approved Estimate	FY12 Proposed Estimate*	FY13 Proposed Estimate*	FY14 Proposed Estimate*
\$130,000	\$204,821.21	\$2,617,313.92	\$200,000	\$950,000	\$300,000	\$300,000

*Beginning in FY12 the budget of E2 will be incorporated into the E1: Beal Lake Conservation Area work task.

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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, CLNB2, PTBB2, MNSW2.

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): Dredge material from Beal Lake Native Fish (E2) was leveled in 2001 to create the substrate for planting the riparian habitat adjacent to Beal Lake. Vegetation and species monitoring are being addressed under F1-F4.

Project Description: The development of the Beal Conservation Area was initiated to research effective ways of using dredge material. The plan called for blending dredge material from Beal Lake with adjacent soils and replanting the mixed soils 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, irrigating, monitoring, and managing.

After various restoration planting techniques were tested on site, many of the test fields developed into habitat that has attracted LCR MSCP covered species. At the end of the 2010 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, but also continues to contribute valuable information about restoration techniques and management practices.

Previous Activities: The dredging of Beal Lake began in 2001. Following site preparation (clearing, root plowing, mixing soils, and installing the irrigation system) the planting of Phase 1 (59 acres) began in 2002. The planting of Phase 2 (48 acres) followed in 2004. Phase 3 (80 acres) was cleared but not planted and has subsequently developed into a mix of screwbean mesquite, saltgrass, tumbleweed, arrowweed, and sparse saltcedar. 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.

FY10 Accomplishments: In April 2010, Beal Lake Riparian Restoration was confirmed by the Steering Committee as a LCR MSCP Conservation Area, to be managed and monitored for the remaining life of the program. The increase in expenditures utilized funds made available from the closure of Work Task E3: Ahakhav Tribal Preserve and reflect the increased activity required to maintain the project.

Maintenance/Management: No new planting occurred at the Beal Lake Conservation Area in 2010.

During June 2010 soil and plant tissue samples were taken and analyzed by a contracted crop consultant. The samples indicated Nitrogen, Phosphorous, Potassium, Zinc, Manganese levels were all still below optimal levels. A mixture of the prescribed fertilizers was applied using the fertigation system September through October 2010.

Irrigation, maintenance, and on-site management was completed using a variety of staff from Havasu National Wildlife Refuge, the LCR MSCP and a members of the Student Conservation Association.

Monitoring: Ground water depth was monitored monthly at 14 piezometers. Temperature and relative humidity were measured using HOBO H8 data loggers.

Post-development vegetation monitoring was conducted in 13 fields (B, C, H, G, F, Q, K, M, L, O, P, FF and JJ). A new monitoring protocol was implemented this year and included rapid plots for quick estimates of density and intensive plots for assessing density, vegetation structure and community composition. Six rapid plots and one intensive plot were evaluated in each of the 13 fields for a total of 78 rapid and 13 intensive plots evaluated. Data are currently being analyzed.

Small mammal surveys were conducted and no cotton rat species were detected. Acoustic bat surveys were conducted quarterly. All four bat species were detected acoustically: California leaf-nosed bat, Townsend's big-eared bat, western red bat, and western yellow bat.

General avian surveys were conducted using an intensive area search method. Bell's vireo (20 territories), yellow warbler (12 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 confirmed breeding at Beal with one nest successfully fledging 1 young. The site was surveyed five separate times for willow flycatchers. Three birds were detected before June 16th and were considered migrants; no breeding southwestern willow flycatchers were detected.

Avian mist netting following the Monitoring Avian Productivity and Survivorship protocol was conducted from 6 May to 4 August. Sonoran yellow warblers, Arizona Bell's vireos, and summer tanagers were color banded to better monitor their breeding activities at Beal Lake.

FY11 Activities: A Land Use Agreement between Reclamation and USFWS was signed in December 2010 for the Beal Lake Conservation Area on the Havasu National Wildlife Refuge. The agreement permits Reclamation staff and contractors access to the site to perform restoration and monitoring activities for the remainder of the program.

Designs are being prepared for the conversion of 14 acres, with a shallow groundwater table and sparsely vegetated with salt cedar, into a patch of willow-marsh that targets the habitat requirements of SWFL. Under the design, one field from Phase 2 and a small low area (9 acres) between Phase 2 and Topock Marsh will be cleared and contoured to elevations that correspond with spring and summer groundwater levels. Saline soils will be excavated from the area to allow planted vegetation to establish. Additionally, four fields that did not respond well to the original planting will be cleared and used to demonstrate the feasibility of using the soil amendment Lassenite Pozzolan. Two of the fields (7 acres) will be used to test the influence of the amendment on seeding success. This project is an extension of C42: Experiments and Demonstration of Soils Amendments for Use in Restoration Sites, which will provide funding for this research. The two remaining fields (9 acres) will have Lassenite Pozzolan incorporated into the top 6 inches of the soil and mass transplanted with cottonwood-willow.

The application of Lassenite Pozzolan is anticipated to reduce irrigation time and frequency (saving funds) by increasing the moisture holding capacity of the soil. The combination of the soil amendment and willow-marsh aims to create the moist understory conditions required for SWFL to select a nesting site. The relatively high cost per acre, net increase of 9 acres, is reasonable due to the Conservation Areas proximity to the only occupied SWFL habitat on the mainstem of the lower Colorado River. Permits for the project are currently being acquired, and construction-planting would occur in FY12.

A Youth Corps Initiative Project, funded by Reclamation's Commissioner's Office in support of the Secretary of Interior's *Youth in the Great Outdoors Initiative*, will occur on the northeast bank line of Beal Lake. A conservation crew will spend eight days collecting willow poles, removing salt cedar, and planting collected poles along the bank line in an effort to create nesting site characteristics required by SWFL: moist soil conditions under a willow canopy.

Management/Maintenance: No new planting is anticipated at the Beal Lake Conservation Area in 2011. Irrigation, maintenance, and on-site management are

anticipated and would be similar to actions taken in FY10 and would continue to utilize a variety of staff from Havasu National Wildlife Refuge, the LCR MSCP and a members of the Student Conservation Association.

Monitoring: Ground water depth will be monitored. Temperature, rainfall, and relative humidity will be monitored using HOBO H8 data logger stations. Vegetation monitoring will occur using rapid and intensive plots. Small mammal monitoring will be conducted annually. Acoustic bat surveys will be conducted quarterly and acoustic data will be collected from the permanent bat monitoring station. General avian surveys utilizing intensive area searches will be conducted. Single species surveys for the southwestern willow flycatcher and yellow-billed cuckoo will be conducted during their respective breeding seasons.

Proposed FY12 Activities: Site management including irrigation, fertilization, screen cleaning, and water level monitoring will continue.

Clearing and planting of two fields within Phase 2 and construction of the willow-marsh designed in FY11 will begin in January 2012. The sites will be cleared, grubbed, and contoured. Willows and wetland vegetation will be acquired and planted. Lassenite pozzolan would be incorporated into the soil prior to planting the fields.

In addition to and in conjunction with the construction mobilization for the willow-marsh habitat, a soil amendment will be tested on 16 unproductive acres within the Conservation Area. Due to the extremely sandy soils throughout the Beal Lake Conservation Area the water holding capacity of the soil is extremely limited, and therefore requires continually irrigation during the summer months. The acreage will be amended with Lassenite Pozzolan, a volcanic ash mixed with diatomaceous earth mined out of Lassen County, California. Adding Lassenite Pozzolan to sand has shown to increase the retention of plant available water within the soil long after an irrigation event. Increasing the water holding capacity of the soil has the potential to reduce both irrigation time and frequency, which could eventually lead to a reduction in management costs.

The Beal Lake Riparian Restoration site (E1) is now a confirmed LCR MSCP Conservation Area to be managed for the remaining term of the program, and the Beal Lake Native Fish site (E2) also involves long term maintenance commitments. Because the two sites are directly adjacent to one another and many of the maintenance activities already overlap E2 will be incorporated into the E1 work task as the Beal Lake Conservation Area.

Monitoring: Ground water depth will be monitored. Temperature, rainfall, and relative humidity will be monitored at HOBO H8 data logger stations. Vegetation monitoring will occur using rapid and intensive plots. Small mammal monitoring will be conducted annually. Acoustic bat surveys will be conducted quarterly and acoustic data will be collected from the permanent bat monitoring station. General avian surveys utilizing intensive area searches will be conducted. Single species surveys for the southwestern

willow flycatcher and yellow-billed cuckoo will be conducted during their respective breeding seasons.

Pertinent Reports: *Beal Lake Riparian Restoration Development and Monitoring Plan* is posted on the LCR MSCP website, and *2008 Beal Lake Riparian Annual Report* is in review prior to posting on the website.