

Work Task E1: Beal Lake Riparian Restoration

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate
\$180,000	\$195,931.36	\$2,412,492.71	\$130,000	\$200,000	\$200,000	\$200,000

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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: Reclamation has partnered with the USFWS to conduct restoration research at Beal Lake until FY09. In April of FY10, a decision will be made to continue research activities, manage any habitat created during the research for the life of the program, or discontinue funding.

In this restoration research project, planting, irrigation, and management techniques, coupled with vegetation and species monitoring, are being demonstrated along with the creation of more than 100 acres of native riparian land cover types. Planting includes clearing, root plowing, and leveling areas previously consisting of sparse arrowweed and saltcedar, and replanting these areas with cottonwood, willow, and mesquite. Irrigation, as needed, is through a pump, pipe, and valve system with dates and volumes documented and reported to Reclamation monthly.

The site has provided an opportunity to test various methods of seeding combined with flood irrigation such as direct hand seeding, whole branch seeding, hydro-seeding, and perimeter seeding. Perimeter seeding refers to the fields where trees were planted around

the perimeter to create a barrier against wind-borne weed seeds and to allow for natural seeding of the center of the field once the trees are mature.

Future management of any created habitat for targeted species such as SWFL and YBCU may include increased irrigation to specific areas and cutting and clearing to re-establish and maintain high vegetation density. Monitoring data will provide guidance on future riparian establishment and management procedures.

Previous Activities: Restoration began in 2001. Site preparation and planting for Phase 1 (59 acres) and site preparation for Phase 2 (48 acres) were completed. 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. In FY04-05, honey mesquite seed was collected and placed in piles in Phase 3 for scarification and distribution by resident wildlife. 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.

FY09 Accomplishments:

Maintenance/Management. A permanent in-line fertigation system with a 24-inch check valve was installed on the main irrigation pipe. Fertilizer is now introduced in the irrigation water, and can be applied any time of the season without interfering with species breeding or nesting. Soil samples were taken twice a season to determine fertilizer needs and the prescribed amount of fertilizer was applied. Irrigation and other maintenance duties such as mowing, and cleaning the Beal Lake fish screens were completed as needed.

Monitoring. Post-development monitoring was conducted in the cottonwood-willow and mesquite habitat at Beal Lake. Ground water depth was monitored monthly at 14 piezometers. Temperature and relative humidity were measured using 15 HOBO H8 data loggers.

Vegetation measurements were collected at 15 permanent plots. Canopy closure ranged from 0 to 100% with an average of 49.36%. The average height and DBH of the stand (combination of cottonwoods and willows) were 6.0 m and 16.0 cm, respectively. Land cover type classification included cottonwood-willow types I-III, and screwbean mesquite-saltcedar types III and IV. Overall classification of the site is cottonwood-willow type I.

Small mammal surveys were conducted in the spring of 2009. No cotton rat species were detected. A permanent bat monitoring station was established in April 2008. Acoustic bat surveys utilizing six Anabats placed in various locations was conducted quarterly. All four covered bat species were detected acoustically: California leaf-nosed bat, pale Townsend's big-eared bat, western red bat, and western yellow bat.

Avian species were surveyed using an intensive area search method. There were 97 pairs of birds comprising 17 species that were detected breeding, including two LCR MSCP covered species, the Arizona Bell's vireo, and the Sonoran yellow warbler.

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 July 3, July 4, and July 17 at Beal Lake, but breeding was not confirmed. One banded southwestern willow flycatcher was detected utilizing Beal Lake in May, but it nested elsewhere on Topock Marsh. Two migratory willow flycatchers were also detected at Beal Lake.

Avian mist netting following the Monitoring Avian Productivity and Survivorship protocol was conducted from May 1 to July 31. Sonoran yellow warblers, Arizona Bell's vireos, and summer tanagers were color banded to better monitor their breeding activities at Beal Lake.

FY10 Activities: This project has been evaluated as a conservation area in the LCR MSCP and the Program Manager is recommending the project be included into the program. A report summarizing the results of wildlife and vegetation monitoring, evaluation of habitat potential, recommendations for existing land cover modifications or management approach, and anticipated credit towards species-specific conservation measures is anticipated to be presented to the Steering Committee in April 2010. With the passing of Resolution 10-0005, the Steering Committee concurs with bringing Beal Lake Riparian into the Lower Colorado River Multi-Species Conservation Program pending the signing of a Land Use Agreement.

Management/Maintenance. Management through irrigation and fertilization will continue. It is anticipated that money transferred through a 2005 Service Agreement with the USFWS will pay for the irrigation and maintenance personnel; thus, less money was requested for the FY10 budget.

If perimeter trees are mature and seeding, the inner portions of those areas will be managed to encourage germination. Contingent upon Beal Lake Riparian Restoration being confirmed as a conservation area to the LCR MSCP, the site will be evaluated to determine whether structural management or replanting is needed. Additionally, the site will be assessed as a possible candidate for a soil amendment study being developed (C42).

Monitoring. Ground water depth will be monitored. Temperature, rainfall, and relative humidity will be monitored at the previously established HOBO H8 data logger stations. Vegetation monitoring will occur at the same points established in 2007. 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. Acoustic bat surveys will be conducted quarterly and acoustic data will be collected from the permanent bat monitoring station.

Proposed FY11 Activities: Management through irrigation and fertilization will continue. The fields planted around the perimeter will continue to be monitored and measures will be taken to encourage germination when the trees are mature enough to seed. Habitat creation research may continue on site with a potential soil amendment study designed to encourage understory growth and surface soil moisture in sandy soils.

Abiotic and biotic habitat monitoring will be conducted. Surveys for all covered species that are associated with cottonwood-willow habitat will be conducted. General avian and bat surveys will be conducted.

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