

Work Task E1: Beal Lake Riparian Restoration

FY07 Estimates	FY07 Actual	Cumulative Accomplishment Through FY07	FY08 Approved Estimate	FY09 Proposed Estimate	FY10 Proposed Estimate*	FY11 Proposed Estimate*
\$358,000	\$198,890	\$2,096,535	\$150,000	\$180,000	\$180,000	\$180,000

*These estimates, which reflect continued management, will be revised to reflect decisions made in FY09.

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Start Date: FY04

Expected Duration: FY09 decision point

Long-term Goal: Restoration research.

Conservation Measures: WIFL 1, WRBA 2, WYBA 3, CRCR 2, YBCU 1, ELOW 1, GIFL1, GIWO 1, VEFL 1, BEVI 1, YWAR 1, SUTA 1, MNSW 2.

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

Purpose: Backwater habitat creation along the Colorado River typically involves excavation or dredging of large quantities of material. Placement and reuse of the excavated material is often a limiting factor when estimating the total cost of creating a backwater. This research project addresses that issue by tracking the process and costs associated with clearing, blending dredge material with existing soils, leveling, and planting various native plants. In addition, the reclaimed area has been divided into cells or small fields with independent flood irrigation capabilities, which allows testing of various planting and seeding methods while potentially creating habitat. Results of this project are expected to be used elsewhere on the LCR in the creation and management of backwater and riparian habitats.

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 FY09, 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. Planning 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 amounts documented and reported to Reclamation monthly. The site provides 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. Trees are planted around the perimeter of the field to block wind-borne weed seeds, and to naturally seed the center of the field when mature. Monitoring will determine if these methods can produce the desired results:

1. Produce densities of cottonwood and willow high enough to shade out competing nonnative vegetation and provide habitat for SWFL.
2. Provide habitat for other LCR MSCP targeted species.

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 vegetation and irrigation will provide guidance on future riparian establishment and management procedures.

Previous Activities: Restoration began in 2001. Site preparation and planting for Phase 1 (57 acres) and site preparation for Phase 2 (50 acres) are completed. Phase 3 (80 acres) was cleared and has 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 possible 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.

FY07 Accomplishments:

Maintenance/Restoration/Management: During FY 07, 107 acres were irrigated using an average of 17 af/ac water. An irrigation schedule and further details on management will be available in the *Beal Riparian and Marsh Restoration Annual Report, 2007*.

Irrigation and maintenance activities were greatly enhanced through an interagency agreement between the USFWS and Reclamation to fund a term position at Havasu NWR through FY09. This employee is dedicated to the project full time and is responsible for all irrigation activities, maintenance of berms, weed control, pump maintenance, and other miscellaneous duties associated with Reclamation’s LCR MSCP activities on Havasu NWR.

Management included extensive irrigation (at least once per week) at the center of the site to encourage growth of recently planted vegetation and utilization by SWFL as the habitat progresses from cottonwood-willow (CW) III and IV to CW I and II. Water retention features installed to maintain wet or moist soils within these areas are still in place in Field K and most are holding moisture post-irrigation longer than surrounding soils.

During FY 2007, high mortality of coyote willow was observed. The site may be too sandy to retain the moisture needed for coyote willow if it is planted too far from the irrigation valves. Coyote willow directly adjacent to the valves is thriving. Goodding’s willow in some of the outer fields is also experiencing high mortality. Soil testing has been conducted and results do not indicate this is due to an increase in soil salinity. The cottonwoods have grown vigorously and do not appear to be impacted.

Plant materials collected at the project site were used for restoration activities at the Colorado River Indian Tribes' 'Ahakhav Tribal Preserve (E3), Palo Verde Ecological Reserve (E4), Cibola Valley Conservation Area (E5), and the Needles-Topock bankline stabilization project (E19).

Habitat Monitoring: Five permanent vegetation monitoring plots were established at the project in fields A (mesquite monthly watering), B (cottonwood monthly watering), D (cottonwood willow monthly watering), P (cottonwood weekly watering), and Q (cottonwood willow weekly watering).

The overstory was comprised of screwbean mesquite, Fremont cottonwood, and Goodding's willow. Overstory tree densities ranged from 567 trees/ac (Field A) to 1,431 trees/ac (Field P). Total canopy cover ranged from 43-78%. The shrub layer was comprised of Goodding's willow, coyote willow, screwbean mesquite, saltcedar, arrowweed, and *Baccharis*. Shrub densities ranged from approximately 500 shrubs/ac (Field B) to over 60,000 shrubs/ac (Field A).

Ten permanent HOBO data logger stations were established in July 2007 to record micro-climate data; data was downloaded every 3 months. Groundwater level measurements were measured every month at 14 locations.

Avian Monitoring: Post-development avian monitoring was conducted utilizing the double sampling intensive and rapid area search method during the breeding season (May-July). The project site was divided into four plots. Two rapid area search surveys were conducted in each plot and seven intensive area search surveys were conducted in two of the plots. Approximately 53 birds/ac, comprising 24 species, were detected. The most abundant species detected were the great-tailed grackle, house finch, red-winged blackbird, and mourning dove. Two LCR-MSCP species, Arizona Bell's vireo and yellow warbler, were detected in low densities (0.5 birds/ac).

Tape playback surveys for the southwestern willow flycatcher were conducted. Two willow flycatchers were detected; however, neither of these individuals were seen nesting nor were located after June 21, 2007 and were assumed to be migrants. There were no tape playback surveys conducted in FY07 for the yellow-billed cuckoo; however, one bird was detected during general bird surveys.

Mammal Monitoring: Small mammal monitoring was implemented during the spring and fall. A total of 81 individuals, comprising seven species, were captured. No LCR MSCP covered species were captured. The cactus mouse was the most abundant species captured.

Bat Monitoring: Acoustic bat surveys were conducted at four locations quarterly (January, April, July, and November). Two nights were sampled at each location per quarter. Mist-netting surveys were conducted in July. The most minutes of bat activity were recorded for the 45-55 Khz species group (California *Myotis*, Yuma *Myotis*, western pipstrelle), 25-30 Khz species group (big brown bat, Brazilian free-tailed bat, pallid bat), and the western pipstrelle. LCR MSCP covered species detected included the western red bat and the western yellow bat. LCR MSCP evaluation species detected included the pale Townsend's big-eared bat and the California leaf-nosed bat. Four Yuma *Myotis* were caught during mist-netting surveys.

Insect Monitoring: Insect monitoring was conducted during one 24-hour period in May. Three Malaise traps were placed within cell K where several artificial pools had been installed. One trap was placed above a pool, one trap was placed between two pools, and one trap was placed away from pools. A total of 1,275 spiders and insects, comprising nine orders, were captured during the 24-hour period. The most abundant order captured was flies and gnats. The traps atop a pool and away from pools caught more bees and wasps and fewer flies and gnats than average. The trap between pools caught more flies and gnats and fewer bees and wasps than average.

FY 08 Activities:

Management/Maintenance: During the breeding season, the field in the interior of the site will be irrigated at least once per week to provide moist microclimate conditions that may encourage SWFL use. Irrigation of the surrounding habitat will be based on the results of soil testing to determine salinity buildup, and on the age and species of the trees. The habitat will be evaluated through monitoring to determine irrigation impacts, and whether additional management is required, such as weed control and replanting. Cover crops that have been planted will be replanted and irrigated as needed. Saltcedar and other weed control may be conducted. This site may also be used as a source for plant material for restoration at other LCR MSCP sites.

Saltcedar control and replanting specific areas with cottonwood and willow is scheduled to be conducted in January-February 2008.

Monitoring: Post-development monitoring of abiotic and biotic habitat characteristics will be conducted in accordance with the Development and Monitoring Plan. Microclimate, including temperature and relative humidity, will be monitored throughout the year. Water depth at 14 wells will be measured once per month throughout the year. Land cover type will be classified using the Anderson and Ohmart classification system. Post-development monitoring for avian, small mammal, and bat species will be conducted. Tape playback surveys for the southwestern flycatcher and the yellow-billed cuckoo will be conducted during the breeding season.

Proposed FY09 Activities:

Management/Maintenance: Management through irrigation, weed control, and cover crop maintenance will continue as in FY08. If perimeter trees are mature and seeding, the inner portions of those areas will be managed to encourage germination. The site will be evaluated to determine whether structural management or replanting is needed.

Monitoring: Post-development monitoring for habitat, avian species, small mammal species, and bats will continue. Data will be obtained, analyzed, and utilized to make on-site management decisions.

The project is scheduled to be re-evaluated to determine future actions in FY09.

Pertinent Reports: *Beal Lake Habitat Restoration, April 2005*, and *Beal Riparian Restoration, Annual Report 2005* are posted on the LCR MSCP Web site. *Beal Lake Riparian Restoration Development and Monitoring Plan*, and *2006 Beal Lake Riparian Annual Report* are in review prior to posting on the Web site.