Work Task E1: Beal Lake Riparian Restoration

FY06 Estimates	FY06 Actual	Cumulative Accomplishment Through FY06	FY07 Approved Estimate	FY08 Proposed Estimate	FY09 Proposed Estimate	FY10 Proposed Estimate
$200,000	$272,378	$1,897,645	$358,000	$150,000	$265,000	$275,000

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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 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 non-native 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.

FY06 Accomplishments:

Maintenance/Restoration/Management — Approximately 107 acres in Phases 1 and 2 were irrigated throughout the growing season. An irrigation schedule and further details on management are in *Beal Riparian and Marsh Restoration Development Plan, 2006* and *Beal Riparian and Marsh Restoration Annual Report, 2006*.

Plans for management of the site include two areas of approximately 15 acres each, which will be managed for SWFL as the habitat progresses from cottonwood-willow (CW) III and IV to CW I and II. In December 2005 and January 2006, water retention features were installed to maintain wet or moist soils within these areas to create the micro-habitat characteristics preferred by SWFLs: higher humidity and lower temperatures. In FY06, 15 acres were irrigated one time per week throughout the growing season.

Approximately 15 acres, which were planted with a perimeter of cottonwood and willow trees, will be allowed to seed naturally. Clearing and irrigating the centers of these areas will occur when the trees around the areas mature and begin to seed. Once this area develops into CW III and IV, it will be irrigated weekly.

Monitoring — In FY06, post-development monitoring of abiotic and biotic habitat components was conducted. Initial survivorship of trees planted on approximately 20 acres in December 2005, was determined in March 2006, and ranged from 40% to 95% per field.

Herbaceous cover was monitored on approximately 90 acres in April 2006. Herbaceous species present were crinklemat, Russian thistle, heliotrope, Bermuda grass, and blue grass. The density of herbaceous species present was low; percent cover characterized as bare ground and leaf litter averaged 85%.

Trees planted or seeded on approximately 45 acres in 2005-06 were monitored for survivorship in November 2006. Growth was determined for a subsample of trees by measuring height and DBH. Fixed radius plots were established on approximately 57 acres planted prior to 2005. Density, basal area, canopy cover, and vertical foliage density were recorded. Results are described in *Beal Riparian and Marsh Restoration Annual Report, 2006*.

Soil samples were taken in March 2006, at 30 locations evenly distributed throughout phases 1 and 2. Samples were analyzed for percent saturation, soil salinity, texture, pH, ortho-phosphate, ammonia, and nitrate. Microclimate data, including relative humidity, temperature, and soil moisture, were collected at eight locations. Water depth was measured monthly at four wells that were installed in October 2005.

The site was classified, using Anderson and Ohmart vegetation classifications, in November 2006. Eight acres were classified as cottonwood/willow (CW) III, 22 acres as CW IV, 21 acres as CW V, 6 acres as saltcedar/screwbean mesquite (SM) III, 15 acres as SM IV, 3 acres as SM V, and 5 acres as arrowweed (AW). Twenty-seven acres were classified as bare ground or undeveloped, including cover crops and other unplanted areas.

Post-development avian point counts and southwestern willow flycatcher surveys were conducted during the 2006 breeding season. One migratory willow flycatcher was detected at the site. The only LCR MSCP covered avian species detected at the site was the yellow warbler, which comprised 1% of the avian population. The three most abundant species detected at the site were the house finch, great-tailed grackle, and Abert's towhee. Post-development monitoring for small mammal species was conducted at the site during the spring and fall. One cotton rat was detected, species undetermined. Other small mammal species detected at the site were deer mouse, desert pocket mouse, Merriam's kangaroo rat, and brush mouse. Post-development monitoring for bat species was also conducted, but no covered bat species were detected.

FY 07 Activities:

Management/Maintenance — The SWFL management areas will be irrigated at least once per week to provide moist micro-climate conditions that may encourage SWFL use during the breeding season. The habitat will be evaluated through monitoring to determine if 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 has also been used as a source for plant material used 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).

Monitoring — Post-development monitoring of abiotic and biotic habitat characteristics will be conducted. In recently planted or seeded plots, tree survivorship and growth will be monitored after the first and second growing season. After three growing seasons, habitat characteristics will be monitored using fixed radius plots. Soil samples will be taken in Phase 1 and 2 and analyzed for percent saturation, soil salinity, texture, pH, ortho-phosphate, ammonia, and nitrate. Microclimate, including temperature, relative humidity, and soil moisture, will be monitored at the site from April to September. Water depth at four wells will be measured once per month.

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.

Proposed FY08 Activities:

Management/Maintenance — Management through irrigation, weed control, and cover crop maintenance will continue as in FY07. 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 if structural management or replanting is needed.

Monitoring — Post-development monitoring for habitat, avian species, small mammal species, and bats will continue as in FY07. Data will be obtained, analyzed, and utilized to make on-site management decisions.

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 posted on the Web site.