Work Task E1: Beal Lake Riparian Restoration

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate*	FY12 Proposed Estimate*
$150,000	$120,026.35	$2,216,561.35	$180,000	$130,000	$180,000	$180,000

*These estimates will be revised to reflect decisions made in FY09.

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Start Date: FY04

Expected Duration: FY10 decision point

Long-term Goal: Restoration research.

Conservation Measures: WIFL1, WRBA2, WYBA3, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, MNSW2, CLNB2, PTBB2, MNSW2

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 volumes 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.

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.

FY08 Accomplishments:

Maintenance/Restoration/Management. During FY08, 107 acres were irrigated using an average of 10.2 acre-feet/acre of water. An irrigation schedule and further details on management will be available in the *Beal Riparian and Marsh Restoration Annual Report, 2008*.

Management included extensive irrigation (once per week) at the center of the site (cells K, L, P) to encourage growth of recently planted vegetation and utilization by SWFL. Water retention features installed to maintain wet or moist soils are still in place in Field K and areas with these features are observationally holding moisture post-irrigation longer than surrounding soils.

Approximately 140 Goodding's willow poles were cut from cell JJ and replanted in cell K to increase the amount of willow in that cell. No other plantings occurred this year.

During FY 2008, a decline in the general health of cottonwood and willows was observed. Soil samples were taken and analyzed revealing extreme deficiencies in nitrogen, potassium, phosphorus and zinc. An aerial application of 400 lbs. of 16-20-0 plus 0.60 lbs/acre of zinc was applied on 45 acres. Observations revealed positive results within a few weeks after the application.

Monitoring. Ground water depth was monitored monthly at 14 piezometers at the project. Temperature and relative humidity were measured using 10 HOBO® H8 data loggers. For the months of May, April, and June, the only variable that fell within the range of known SWFL habitat was mean nocturnal vapor pressure. However, this variable is 1 of the 2 that is known to be significantly different in occupied habitat than unoccupied habitat. Vegetation measurements were collected in September and October of 2008. Fifteen permanent plots were established and monitored for density, ground cover, total vegetation volume, average tree diameter at breast height (DBH) and average tree height. There were 37 Fremont cottonwood trees per acre and 28 screwbean mesquite trees per acre that were over two inches in DBH present in the overstory. There were 9,015 shrubs and stems per acre present in the shrub and intermediate tree layer.

Species present in the shrub and intermediate layer included *Baccharis*, arroweed, Fremont cottonwood, screwbean mesquite, velvet mesquite, coyote willow, saltcedar, and desert broom. Ground cover comprised 6% of the total land surface; species present included Bermudagrass, purple deadnettle, Mexican sprangletop, horseweed, and witchgrass. Canopy cover at the site was 48.8%.

Single species surveys were conducted for the southwestern willow flycatcher and western yellow-billed cuckoo during the breeding season. No individuals of these species were detected breeding at the project. Three migratory willow flycatchers and 4 incidental observations of the western yellow-billed cuckoo were detected. General avian surveys were conducted at the project from 1 May to 30 June. Three pairs of the Arizona Bell's vireo and 2 pairs of the Sonoran yellow warbler were detected breeding at the project. The following were other species of breeding birds detected: blue grosbeak, Abert's towhee, song sparrow, verdin, yellow-breasted chat, Gambel's quail, black-tailed gnatcatcher, black chinned hummingbird, Bullock's oriole, crissal thrasher, white-winged dove, Lucy's warbler, greater roadrunner and western kingbird.

Small mammal surveys were conducted at the project in the spring of 2007 and the fall of 2008. No cotton rats were detected. Other small mammal species detected were the deer mouse, cactus mouse, western pocket mouse, Merriam's kangaroo rat and southern grasshopper mouse. A permanent bat monitoring station was established in April 2008. Acoustic bat surveys utilizing 6 Anabats placed across the project was conducted quarterly. Mist-netting for bat species was conducted monthly from April to July 2008. There were no covered species detected during mist-netting.

FY09 Activities:

Maintenance/Management. A permanent fertilizer valve and a 24-inch check valve will be installed in-line the main irrigation pipe. This will allow fertilizer to be introduced in the irrigation water. Fertilizer than can be applied any time of the season without interfering with species breeding season, nesting, etc. Soil samples will be taken twice a season to determine fertilizer needs and where applicable, the prescribed amount of fertilizers will be applied Reclamation's Yuma Area Office is providing personnel for the 2009 irrigation season; other maintenance duties will be assigned as needed. This project will be evaluated in 2009 for inclusion as a conservation area in the LCR MSCP.

Monitoring. Ground water depth measurements will be monitored monthly at the 14 piezometers. Temperature 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. Avian surveys utilizing intensive area searches/spot mapping, the same protocol used in 2008, will be conducted from 15 April till 15 June 2008. Single species surveys for the southwestern willow flycatcher and yellow-billed cuckoo will be conducted during the breeding season. Small mammal monitoring will be conducted in the spring and the fall of 2008. Data will be collected at the permanent acoustic bat monitoring station installed in 2008. Acoustic bat surveys will be conducted at the entire project quarterly.

Proposed FY10 Activities: A report detailing 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 SC with the FY11 Workplan in April of 2010. The report will also discuss commitments of the land use agreement and the process for suggesting and implementing adaptive management actions.

Management/Maintenance. Management through irrigation, weed control, and cover crop maintenance will continue as in FY09. 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. Abiotic and biotic habitat monitoring will be conducted. Surveys for all covered species that are associated with cottonwood/willow/mesquite habitat will be conducted. General avian, small mammal and bat surveys will be conducted. Data from the permanent bat acoustic station will continue to be collected.

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 and *2007 Beal Lake Riparian Annual Report* is in review prior to posting on the Web site.