

Work Task E5: Cibola Valley Conservation Area

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$1,703,000	\$3,611,928.60	\$8,419,959.60	\$1,000,000	\$1,300,000	\$1,100,000	\$1,300,000

*\$2,590,630 was obligated to secure 1,419 acre-feet of water from the Hopi Tribe.

Contact: Bill Singleton, (702) 293-8159, wsingleton@usbr.gov

Start Date: FY05

Expected Duration: FY55

Long-term Goal: Habitat creation

Conservation Measures: WIFL1, WRBA2, WYBA3, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, MNSW2, CLMB2, PTBB2

Location: Reach 4, river miles 99-104, AZ

Purpose: Create and manage a mosaic of native land cover types for LCR MSCP covered species.

Connections with Other Work Tasks (past and future): Vegetation and species monitoring are being addressed under F1-F4. Insect populations may be investigated as described in C5.

Project Description: In 2007, Reclamation secured 1,309.1 acres of land serviced by the Cibola Valley Irrigation and Drainage District and established the Cibola Valley Conservation Area (CVCA). The Arizona Game and Fish Department (AGFD) acquired the CVCA in September 2007 through a multi-organizational agreement involving the AGFD, Reclamation, the Mohave County Water Authority, The Conservation Fund, and the Hopi Tribe. Through these agreements, AGFD acquired CVCA fee title and water entitlements and agreed to manage the site.

Cibola Valley Conservation Area is located in southwestern La Paz County, Arizona, about 15 miles south of Blythe, California. The valley encompasses the land inside an engineered bend of the lower Colorado River and a remnant oxbow on the west side of the river (Palo Verde Oxbow). It is currently farmed for cotton and alfalfa. The area is bordered to the south by Cibola NWR and on the east by unimproved land under the jurisdiction of the Bureau of Land Management. The river forms the north and west boundaries, except for the Palo Verde Oxbow, from river miles 98.8 to 104.9.

Reclamation has secured 1,300 acre feet of irrigation water per year for the AGFD and 1,419 acre feet per year of the Hopi Tribe's fourth priority Colorado River water entitlement. In addition, Reclamation already maintains a fourth-priority entitlement of 118.94 ac-ft per year at CVCA. The irrigation water will be used for establishment and maintenance of land cover types

throughout the life of the program. Agricultural areas have irrigation systems in place that are conducive for water management of riparian species. Checks, which are small borders placed within a given field, allow for flooding of only a portion of a field. This provides additional flexibility to create and maintain standing water or saturated soil areas for covered species.

Previous Activities: To date, 265 acres of cottonwood-willow and honey mesquite land cover types have been established in Phases 1-3 and are being managed for LCR MSCP covered species.

FY08 Accomplishments:

Maintenance/Restoration/Management. The *Cibola Valley Conservation Area Restoration Development Plan: Overview, Phase 1, Phase 2, Phase 3, and Phase 4* were completed and posted on the LCR MSCP Web site. A Memorandum of Understanding was signed in September 2008 between Reclamation and AGFD that assures availability of land and water resources for the 50-year term of the program. Planning for development and creation of habitat on CVCA continued in conjunction with Reclamation's partner, AGFD. In addition, 1,419 acre-feet of water was purchased from the Hopi Tribe for the site.

Phase 2, a 71-acre parcel was planted in March 2008, in accordance with its restoration development plan, which established approximately 197,000 of cottonwood, willows, and *Atriplex* for future SWFL habitat. Phase 2 had been left fallow during FY07 and disked four times throughout the growing season in an attempt to reduce the morning glory and volunteer cotton seed bank in the soil. A cover crop was not initially planted in this phase. Instead, 40-inch wide furrows were created for planting. A pre-emergent herbicide, Treflan, was applied prior to planting, to control annual grasses and broadleaf weeds. The irrigation infrastructure between Phases 1 and 2 was repaired. Main access roads were graveled with Type-II base to control dust, in accordance with local regulations.

Phase 2 native plants were planted on the tops of furrows with a plant in-line spacing of 5 feet and a furrow row spacing of 40 inches wide. The phase was divided into 10 fields or checks. Nine of the checks were planted with cottonwood-willow land cover types, and one check was planted with *Atriplex*. Invasive weeds were controlled by mechanically cultivating the furrows and with the application of pre-emergents during their first year of growth. Utilizing a cultivator kept the furrows weed free until the trees were too tall for the tractor and cultivator to clear. A cover crop of alfalfa was applied in June in order to create a dense ground mat, which hinders the growth of invasive plants.

In May, Ivyleaf morning glory was present in the fields of both Phases 1, 2, and, to a smaller degree, in Phase 3. The incursion was not as widespread as in the previous year. Several herbicides, such as Caparol and Roundup, were tried unsuccessfully in prior years to control this invasive plant. Mechanical cultivation and manual labor were used to remove morning glory in Phase 2. This proved to be a labor-intensive and expensive procedure.

A farm advisory board was formed to address farming issues, tap into local resources, and provide information to the local communities. Acting on advice from the local farm advisory board and the contract farmer, Phase 4 was left fallow during FY08 in an attempt to reduce the

morning glory and volunteer cotton seed bank in the soil. Phase 4 acreage was irrigated three times during the year to encourage morning glory and volunteer cotton growth, and then was disked each time to remove any germinating plants.

A 200-acre ground stabilization project, located west of Phases 1 and 2, was initiated in the fall of 2008. In an effort to eliminate blowing dust, approximately 80 acres will be planted with a mix of native seeds and sprinkler irrigated. The remaining 120 acres will be planted in furrows in the spring of 2009 with a mesquite/*Atriplex* combination.

A local crop consultant was contracted to take soil samples, and recommend irrigation schedules and fertilizer applications. As a certified agronomist, the consultant conducted inspections focusing on general plant health, evidence of disease, over-irrigation, under-irrigation, water drainage, general nutrition, and insect problems. The consultant's irrigation recommendations were sent directly to the contract farmer with specific irrigation regime instructions. During the growing season, the consultant also tracked plant vigor by sampling and analyzing plant tissue for nitrogen levels and other nutrients as necessary. All reports were forwarded to Reclamation with recommendations for treatment.

Volunteer cotton growth at these sites has become an increasing problem. All phases to date have been planted on fields which have previously been planted with cotton for years. These volunteer cotton plants, as mandated by Arizona state law, must be destroyed/removed by the required cotton mow-down date, yearly, in late January in an attempt to minimize the spread of pink bollworm larvae. Reclamation is working in conjunction with the Arizona Cotton Research and Protection Council (ACRPC) in reference to the ongoing International Pink Bollworm Eradication Program. The ACRPC's mission is to protect and maintain the viability of the Arizona cotton industry by conducting and sponsoring activities that provide growers with practical, economically sustainable technologies relating to cotton production or its protection. This includes programs of cotton pest control and/or eradication. ACRPC activities are funded through an annual assessment on each bale of cotton produced in Arizona.

The University of Arizona had been conducting a 3-year field experiment to evaluate the response of three native tree species to a variety of surface irrigation regimes and fertilization. As part of this activity, Phase 1 fields were thoroughly mapped using electromagnetic induction, which allows for spatial mapping of soil texture and salinity. Whole plant measurements were made, including plant height, diameter, and leaf area index. During the growing season, leaf water potential and leaf gas exchange was to be measured monthly.

Unfortunately, during the internal review of the research agreement it was determined that the project encountered certain field conditions (morning glory infestation, which caused localized mortality of trees around sensors and difficulties in accurately estimating water delivery) that would not deliver the results as originally contemplated under the agreement as awarded. The principal investigator from the University has concurred, and as a result, the continuation of the research agreement was not in the best interest of either party and was therefore terminated.

A document titled, *Cibola Valley Conservation Area Restoration Development Plan: Phase 4*, was drafted that includes design and planting plan of Phase 4 that would be established in FY09. Approximately 58 acres of honey mesquite will be planted.

Monitoring. Pre- and post-development monitoring was conducted at Phase 1, Phase 2, Phase 3, and at the control site on CVCA. Soil samples were obtained and most nutrients and salinity levels were within normal parameters. Vegetation data was collected at Phase 1, 2, and 3. Eight plots were established in Phase 1, 20 plots in Phase 2, and 14 in Phase 3. Vegetation types included cottonwood, willow, and mesquite. The structural types differed, as related to stand age. Average density for Phase 1 after 3 year's growth ranges from 775 to 7665 trees/acre, average height is 8.1 m, and average diameter at breast height (dbh) is 23.7 cm. Average density for Phase 2 after 1 year's growth ranges from 450 to 1813 trees/acre, average height is 4.29 m, and average dbh is 9.56 cm. Average density for Phase 3 after 3 year's growth ranges from 1200 to 9350 trees/acre, average height is 6.9 m, and average dbh 14.8 cm.

Avian species were monitored at CVCA during the breeding season of 2008 using rapid and intensive avian area search surveys on phases 1-3 for post development, and on phases 5-6 for pre-development. There was an average of 399 birds per survey detected at phases 1 and 3. There were 57 pairs of birds comprising 12 species detected breeding. One LCR MSCP covered species; the Sonoran yellow warbler (*Dendroica petechia sonorana*) was detected breeding at these phases.

Southwestern willow flycatcher surveys were conducted on Phase 1. Two willow flycatchers were detected on 18 June, and assumed to be migrants. The site was surveyed five times, and large flocks of cowbirds were detected on all visits.

Yellow-billed cuckoo surveys were conducted in Phase 1, which was planted in 2007. Nesting was documented at three locations within CVCA. One nest with three eggs was found on 15 July. All three eggs hatched and all three hatchlings fledged successfully. A second nest with 2 eggs was found on 6 August in very close proximity to first nest, and was believed to belong to the same nesting pair of cuckoos. One egg hatched, but the nest was depredated shortly after, resulting in no successful fledglings. A second pair of adult cuckoos was repeatedly seen throughout the breeding season in the southeast corner of Phase 1, approximately 700 meters from the other nesting pair. These birds were observed at the same time by separate observers, confirming it was indeed a separate pair. Although no nest was found, nesting was confirmed by the observance of an approximately 2 week old fledgling and an adult on July 8.

Small mammal trapping was conducted on Phases 1, 2, and 3 and the Control site. A total of 1155 trap nights (a trap night is defined as one *trap* opened for one *night* = 1 *trap night*) were conducted during 2008. A total of four species were captured including cactus mouse (*Peromyscus eremicus*), deer mouse (*Peromyscus maniculatus*), desert pocket mouse (*Chaetodipus penicillatus*), and house mouse (*Mus musculus*). Phase 2 had the most captures with 47 individuals, and the control had the least captures with 0 individuals. Total number of individuals captured was 85 with the deer mouse being most abundant (n = 31) and the desert pocket mouse being least abundant (n = 3). No Colorado River cotton rats were captured at CVCA.

Acoustic bat surveys were conducted using Anabat II bat detectors coupled to zero-crossing analysis interface modules (ZCAIMs) and SD1 detectors (ZCAIM and detector combined in a single unit). No minutes of bat activity were recorded for either the western red bat or the western yellow bat during any season or in any habitat during FY 2008. A total of 16 Pale Townsend's big-eared bat minutes were recorded in young cottonwood-willow habitats during fall, spring, and summer. The California leaf-nosed bat is the most numerous of the covered and evaluation bat species with 45 bat minutes recorded in restored habitats during the fall sample period and 31 minutes during the summer period.

FY09 Activities: Planting and field preparation of Phase 4 is intended to create approximately 58 acres of honey mesquite land cover that in coordination with earlier and later planting phases is designed to create a native vegetation mosaic. Phase 4 consists of seven fields, or checks, arranged in size from 8 to 10 acres, that will be planted in east-west rows.

The ground will be prepared for planting by disking, laser leveling, and creating furrows in preparation for hand planting of 1-gallon potted mesquites (9,200). Smaller *Atriplex* (6,200) plants will also be hand-planted between the mesquite. These plants will be planted in furrows with a plant in-line spacing of 15 feet and a furrow row spacing of 18 feet wide. This wide furrow spacing saves irrigation water and allows for a tractor to disk invasive salt cedar and volunteer cotton that grow between the planted furrows.

Soil samples will be taken prior to planting, soil samples will be taken to provide nutrient availability information. A crop consultant will be utilized to recommend schedules for water and fertilizer applications. During the growing season, the consultant may sample and analyze plant tissue for nitrogen levels and other nutrients as necessary.

A document titled, *Cibola Valley Conservation Area Restoration Development Plan: Phase 5*, will be drafted which includes design and planting plan of Phase 5 that would be established in FY10. Approximately 72 acres of honey mesquite and *Atriplex* will be planted.

The remaining 120 acres of a 200-acre ground stabilization project will be planted in the spring of 2009 with a mesquite/*Atriplex* combination. Similar to Phase 4, these plants will be planted in furrows with a plant in-line spacing of 15 feet and a furrow row spacing of 18 feet wide. This wide furrow spacing saves irrigation water and allows for a tractor to disk invasive salt cedar and volunteer cotton that grow between the planted furrows. Habitat, avian, small mammal, and bat monitoring will continue.

Proposed FY10 Activities: The planting and field preparation of Phase 5, located east of Phase 4, is designed to create 71 acres of honey mesquite land cover. All the previous phases will be developed, maintained, monitored, and adaptively managed riparian habitat for targeted species. Winter wheat will be planted and is anticipated to benefit the dove population. Habitat, avian, small mammal, and bat monitoring will continue.

A document titled, *Cibola Valley Conservation Area Restoration Development Plan: Phase 6*, will be drafted and include design and planting plans for Phase 6, which will be established in FY11. Approximately 89 acres of honey mesquite will be planted.

Pertinent Reports: *Soil-Plant-Water-Nutrient Relationships of Populus fremontii, Salix gooddingii, and Salix exigua During Native Habitat Restoration*, the study plan from the Department of Soil, Water, and Environmental Science, University of Arizona, is available upon request. *Cibola Valley Conservation Area Restoration Development Plan: Overview; Cibola Valley Conservation Area Restoration Development Plan: Phase 1; Cibola Valley Conservation Area Restoration Development Plan: Phase 2; Cibola Valley Conservation Area Restoration Development Plan: Phase 3; Cibola Valley Conservation Area Draft Report for Phase 4; Cibola Valley Conservation Area Annual Report, 2006; Cibola Valley Conservation Area Annual Report, 2007*, will be posted when available on the LCR MSCP Web site.