

Work Task E4: Palo Verde Ecological Reserve

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$1,185,000	\$828,982.19	\$2,268,701.19	\$1,250,000	\$1,683,000	\$1,800,000	\$2,174,000

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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, CDFG, river miles 129-133, CA

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 are being evaluated under C5 and C7.

Project Description: The Palo Verde Ecological Reserve (PVER) encompasses more than 1,300 acres. This property (formerly known as the Travis Ranch) has been made available to the LCR MSCP for habitat restoration activities by CDFG.

The eastern boundary of the property (more than 4 miles) is adjacent to the Colorado River; the western boundary is adjacent to active agricultural fields. The PVER has an extensive infrastructure consisting of miles of lined irrigation ditches, roads, and a pump. Currently, the acreage is leased to a contract farmer and is planted with crops of alfalfa and wheat. Each year a portion of the active crop acreage will be taken out of production to develop the next phase of native habitat. The intent is to create as much riparian habitat as practical. Generally, all phases at PVER are targeted for SWFL, YBCU, and other covered species.

To date, standard farming practices are an efficient and effective way to convert agricultural cropland to habitat. Costs for development and maintenance of the habitat include such farming methods as land leveling, disking, irrigation of crops, repair and maintenance of the irrigation system, and the application of fertilizer and herbicide. Palo Verde Irrigation District provides water to PVER. The costs associated with irrigation, electricity, and water is proportional to the amount of acreage that has been converted to habitat.

The mass transplanting demonstration (E7) has proven to be a cost-effective method for planting riparian trees and shrubs. This method includes the collection of plant material, propagation, and planting of native species.

It is essential to have a mosaic of habitats that contain areas of riparian species (including mesquite), and ground covers or open areas. Ground cover is an effective method of controlling nonnative species and provides another layer of vegetation for habitat. Ground covers are planted with transplants or by seed; costs vary with the methods of planting used. Mesquite trees are generally planted by a tree planter or auger. Typically, mesquite costs are based on a 1-gallon planted tree.

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, 223 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 Palo Verde Ecological Reserve Development Plan: Phase 4* document was reviewed and approved by CDFG. According to the design, 57 acres of cottonwood-willow were scheduled to be planted; however, some of the trees' quality and health were compromised by heat prior to planting. As a result it was decided not to plant the stressed trees at that time. Approximately 45 acres of cottonwood-willow land cover type were planted during Phase 3. Approximately 12 acres of cottonwood-willow land cover type will be planted in the spring of 2009, as well as 22 acres of mesquite on the 84 acres of managed land in Phase 3.

Soil samples were taken by the contract crop consultant in Phase 1 and Phase 2 and prior to planting in Phase 3. The samples in Phase 1 and 2 indicated deficiencies of NO₃-N (nitrogen), and PO₃-P (phosphorus). An application of 10-34-0 was added in an irrigation cycle to these phases. In Phase 3 additional deficiencies of K (potassium) and Zn (zinc) were also found. Prior to planting Phase 3 an application of urea 11-52-0 muriate and zinc sulfate were applied.

In March, 2008, trees and shrubs were planted in Checks 1-8, utilizing mass transplanting. Over 101,000 trees and shrubs were planted within a 3-day period. The checks were planted according to the design (*Palo Verde Ecological Reserve: Restoration Development Plan Phase 3, 2007*), with exception of check 9 and 10 which were left in a cover crop until the spring of 2009. The 2008 planting contained the following percentages of plants and trees: 13% *Atriplex*, 29% cottonwood, 3% *Baccharis*, 2% Goodding's willow, and 53% coyote willow. The average number was 2,800 plants per acre.

Checks 1-3 were planted with *Atriplex*; the mid-section of each of these checks were left with the cover crop until spring of 2009, and at that time 1,800 mesquite trees will be planted. The field

was kept in a cover crop so that the integrity of ground preparation remains, while discouraging the growth of invasive weeds. The expenditures at PVER were reduced due to efficiency of farming services, and fewer trees planted.

Monitoring. In 2008, revised vegetation/habitat monitoring protocols were implemented. Vegetation plots were established and monitored at PVER to characterize the overstory, shrub and intermediate trees, ground cover, crown closure and total vegetation volume. Analysis of the data is in progress.

Small mammals were surveyed at PVER, both in pre-developed, agricultural fields, planted mesquite habitat and in an adjacent undeveloped area of suitable habitat along the river. No cotton rats were found within the plantings at PVER, nor in any of the pre-developed areas. However, at the strip of land adjacent to PVER, 14 cotton rats were captured. Laboratory analysis of blood samples to examine DNA has confirmed they are *Sigmodon arizonae plenus*.

There was 169 total minutes of bat activity for the four covered species, of which the California leaf-nosed bat was the most numerous. This species was recorded mostly over agriculture and saltcedar habitat. Yellow bats and Townsend's big eared bats were also detected over agriculture and saltcedar habitats adjacent to the plantings. Western red bats were detected in young cottonwood habitat.

Avian species were monitored at PVER using an intensive area search method. In the pre-development phases (Phases 4, 7, 8, and 9), an average of 302 birds per survey and 31 species were detected between the two survey periods. In Phase 3, where the habitat was in its first year of growth, an average of 39 birds per survey were detected. There were 17 pairs of birds comprising 8 species detected breeding in Phase 2, which was in its second year of growth, including one LCR MSCP covered species, the Arizona bell's vireo (*Vireo bellii arizonae*). An average of 56 non-breeding birds per survey were also found in Phase 2.

Specific surveys were conducted at PVER for yellow-billed cuckoos. During five surveys and two follow-up visits, one individual was detected on 26 June, and one on 17 July. Both detections were auditory only. Due to the small size of the site and the limited number of detections, it is unlikely that breeding occurred at this site.

FY09 Activities: The development of Phase 4 (100 acres) is the focus in FY09. The ground will be prepped for Phase 4 planting, which includes disking, laser leveling, and plowing as needed for mass transplanting the trees and shrubs. Soil samples will be taken, analyzed for fertilizer needs and applied prior to planting. Since the dense matting of cover crop was successful with reducing weed infestations in Phase 2 & 3, this method will be utilized in Phase 4. In the checks planted with cottonwood-willow land cover types, crops of alfalfa and rye will be seeded, while in the checks of mesquite, a native seed mix will be used. Mass transplanting of approximately 100 acres of riparian species (approximately 225,000 of cottonwood, willows, and *Baccharis*) will take place in March. Spacing will be 6-foot inline with 40 inches between rows to reduce cost and still provide the structural density required by the species. Mesquite and *Atriplex* will also be hand planted. The planting will integrate a random mixing of Goodding's willow and coyote willow with edges of cottonwood. Open areas will be incorporated along the borders,

allowing for the flexibility to rework the borders, if needed, without disturbing the trees and shrubs. Approximately 12 acres in Phase 3 that were not planted in 2008 will be planted this year with cottonwood, willow, and *Baccharis*, along with 22 acres of mesquite.

A crop consultant will be contracted for soil analysis, soil moisture and general health checks. Weeds will be managed with the application of a pre-emergent herbicide, manual removal where possible and target herbicides. Visual monitoring for destructive insects will continue and when applicable pesticides may be used.

Irrigation will continue on the same schedule until data becomes available that indicates adjustments are needed.

The plan and design for Phase 5, development of approximately 117 acres, will be drafted and is expected to establish this phase with cottonwood-willow land cover type.

Proposed FY10 Activities: Field preparation and planting of Phase 5 will be conducted to create as much riparian habitat as practical with the intent to target habitat for SWFL, YBCU, and other covered species. Previous phases will be monitored and adaptively managed for the targeted species. Site preparation for mass transplanting of riparian trees and shrubs on approximately 117 acres will be conducted. The plan and design for continued expansion of riparian habitat will be included in Phase 6.

Pertinent Reports: The *Palo Verde Ecological Reserve Restoration Development Plan: Overview*, which outlines the general development of the property, the *Palo Verde Ecological Reserve Restoration Development Plan: Phase 1*, which described the restoration activities planned for FY06, *Palo Verde Ecological Reserve Restoration Development Plan: Phase 2*, which described the restoration activities planned for FY07, the *Palo Verde Ecological Reserve Restoration Development Plan: Phase 3*, and the *Palo Verde Ecological Reserve Restoration Development Plan: Phase 4*, which described the restoration activities planned for FY09 are posted on the LCR MSCP Web site. *Acoustic Bat Surveys Lower Colorado River Pilot Study: April 2006*, and *Palo Verde Ecological Reserve Annual Report, 2006* will be posted when available.