Work Task E4: Palo Verde Ecological Reserve

FY07 Estimates	FY07 Actual	Cumulative Accomplishment Through FY07	FY08 Approved Estimate	FY09 Proposed Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate
$976,000	$782,488	$1,439,719	$1,185,000	$1,250,000	$1,800,000	$1,800,000

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Start Date: FY05

Expected Duration: FY55

Long-term Goal: Habitat creation.

Conservation Measures: CLRA1, WIFL1, WRBA2, WYBA3, CRCR2, YHCR2, LEBI1, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, and MNSW2.

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 C6.

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.

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

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 by methods of planting used. Mesquite trees are generally planted by the use of 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. However, standing or saturated soil areas for covered species may need to be created or amended, and managed throughout the term of the program.

Previous Activities: PVER is being developed in phases over a number of fiscal year. Through FY06, Phase 1 was planted and created a 31-acre native plant nursery. Additional information, including restoration development and monitoring plans are available online.

FY07 Accomplishments: *The Palo Verde Ecological Reserve Development Plan: Phase 3* document was reviewed and approved by CDFG.

In the spring of 2007, Phase 2 was implemented when more than 128,000 coyote willow, Goodding's willow, *Baccharis,* and Fremont cottonwood were mass transplanted on 55 acres in 3 days, along with a 1-acre area of saltgrass. An additional 20 acres were hand planted with approximately 20,000 coyote willow, Goodding's willow, and Fremont cottonwood for a total of 75 planted acres of cottonwood-willow land cover type. To limit the invasion of weeds, a dense cover crop of ryegrass and alfalfa was seeded 5 days prior to the mass transplanting.

In October, over 900 honey mesquite trees and 2,700 *Atriplex* plants were planted in check 1, covering approximately 7 acres. The alfalfa-ryegrass cover crop was mowed for ease of planting. The mesquite trees were hand planted, while the *Atriplex* was planted using dibble bars. Fall planting was completed in 5 hours.

Throughout the 2007 growing season, minimal weed infestations were identified and controlled with manual techniques (removing by hand) or applying chemicals such as Roundup. In July the cottonwood trees in the nursery became infested with lace bugs. An aerial application of a pesticide was completed and within 5 days the trees showed a remarkable recovery.

A wind storm came through the area in October damaging over 50 nursery trees; however, no damage was apparent to the younger trees in Phase 2. The damaged trees suffered breakage at ground level and some were topped. We plan to leave the trees as is because removal is not necessary or cost effective at this time. It is quite probable that most trees will recover and stump sprout next spring. The remaining trees within the nursery have grown substantially and will allow the trees to be utilized for cuttings intended for 2008 plantings at restoration sites. Collection of plant material by the contractor occurred in November and December 2007.

Vegetation Monitoring: During the spring 2007 planting, species composition was 44% coyote willow, 36% Goodding's willow, 13% cottonwood, and 7% *Baccharis*. Initial survivorship of trees 4 months after planting was 99%.

Vegetation monitoring plots were established in the Nursery and Phase 2. The nursery, planted in March 2006, was classified as CW II. The average height of cottonwood trees in the nursery was 20 ft and average willow height was 22 ft. The understory consisted largely of alfalfa, which had been planted as a cover crop prior to nursery establishment. Phase 2, which was planted in March 2007, was classified as CW VI. After the first growing season, the average height of cottonwood trees was 7.2 ft. Bermuda grass was the dominant groundcover/understory.

Bird Monitoring: Point counts surveys were conducted for pre-development monitoring. Area search protocol was used to conduct post-development monitoring. Red-winged blackbirds were the most abundant species detected during both surveys. No LCR MSCP avian covered species were detected.

Small Mammal Monitoring: During March 2007, pre-development trapping for small mammals was conducted in Phase 2, resulting in the capture of one species, the deer mouse. Small mammal diversity increased somewhat post-development with the capture of *Mus musculus*, cactus mouse, and desert pocket mouse in November 2007. In the nursery, only nonnative house mice were captured during post-development trapping. House mice were the most abundant species captured in both the nursery and Phase 2.

Bat Monitoring: Several bat species were detected at PVER during quarterly surveys. Activity was highest in July, followed by November, April, and January. Species recorded included western pipistrelle, pocketed free-tailed bat, cave *Myotis*, hoary bat, California leaf-nosed bat, western red bat, mastiff bat, western yellow bat and silver-haired bat.

FY08 Activities: The development of Phase 3 (80 acres) is the focus in FY08. The ground will be prepped for Phase 3 planting, which includes disking, laser leveling, and plowing as needed to mass transplant the trees and shrubs. Since the dense matting of cover crop was successful with reducing weed infestations in Phase 2, this method will be utilized in Phase 3. In the checks planted with cottonwood-willow land cover types, alfalfa and ryegrass will be seeded as a cover crop. Mass transplanting of approximately 80 acres of riparian species (approximately 120,000 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. Honey mesquite will be hand planted in the fall. 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 the flexibility to rework the borders if needed, without disturbing the trees and shrubs.

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 become available that indicate adjustments are needed.

The plan and design for Phase 4 development of approximately 108 acres will be drafted. In Phase 4, cottonwood-willow land cover type will be established to provide habitat for SWFL.

Monitoring will be conducted in accordance with the posted development plans. Vegetation monitoring will occur annually for the next several years as the stands change quickly as they mature. Pre- and post-development monitoring for avian, bat, and small mammal species will continue.

Proposed FY09 Activities: Field preparation and planting of Phase 4 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 108 acres will be conducted. The plan and design will be developed for continued expansion of riparian habitat and will be included in Phase 5.

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, and the *Palo Verde Ecological Reserve Restoration Development Plan: Phase 3*, which described the restoration activities planned for FY08 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.