

## Work Task F1: Habitat Monitoring

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
\$350,000	\$480,326.82	\$2,035,578.55	\$425,000	\$650,000	\$650,000	\$650,000

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**Start Date:** FY05

**Expected Duration:** FY55

**Long-term Goal:** Pre- and Post-development monitoring.

**Conservation Measures:** MRM2 (CLRA, WIFL, WRBA, WYBA, CRCR, YHCR, LEBI, BLRA, YBCU, ELOW, GIFL, GIWO, VEFL, BEVI, YWAR, SUTA, MNSW).

**Location:** Beal Lake, Havasu NWR, Arizona; Bill Williams River NWR, Arizona; PVER, California; CVCA, Arizona; Cibola Unit 1, Cibola NWR, Cibola, Arizona; Hart Mine Marsh, Cibola NWR, Cibola, Arizona, Imperial Ponds, Imperial NWR, Arizona; LDCA, Yuma, Arizona.

**Purpose:** Post-development monitoring is necessary to assess the effectiveness of each habitat creation and restoration sites plus management activities. Specifically, monitoring will include biotic components and abiotic components. Habitat monitoring data will guide management decisions throughout the life of the LCR MSCP.

**Connections with Other Work Tasks (past and future):** Post-development habitat monitoring will be conducted at habitat creation sites detailed in Section E.

**Project Description:** Post-development monitoring will assess change in habitat characteristics (such as vegetation growth and density, microclimate, and soil moisture and nutrients) over time and will attempt to determine the causes of said change. Monitoring data will be used to document progress towards achieving the biological goals and minimum habitat requirements for covered species, and document the number of acreage by land cover type (riparian, mesquite, marsh) each year.

**Previous Activities:** Five habitat creation sites were monitored in FY09 using pilot year monitoring protocols. In FY10, the new double sampling protocol was used to monitor habitats and included density, species richness, vegetation structure, ground cover, canopy closure, distance to nearest standing water, and distance to nearest open space. Temperature and relative humidity were also collected.

**FY11 Accomplishments:** Habitat monitoring continued in FY11 at Beal Lake, Cibola National Wildlife Refuge Unit #1, Cibola Valley Conservation Area, and Palo Verde Ecological Reserve using 2010 monitoring protocols. A statistical power analysis was performed using 2010 data to determine the amount of sampling units (i.e. resources) necessary to state with confidence that an impact or change in measured parameters has or has not occurred while maintaining an acceptable level of variability in the data and thus addressing our management objectives. Where reductions in numbers of plots were necessary, 2011 plots were randomly selected from the existing 2010 intensive plots. As a result, data were collected at 352 intensive plots in 2011; data included density, species richness, vegetation structure, ground cover, canopy closure, distance to nearest standing water, and distance to nearest open space within 30 meters of plot center. Temperature and relative humidity data were collected at 90 locations across the four habitat creation sites.

Vegetation monitoring plots were added at the Bill Williams River NWR to assess habitats occupied by LCR MSCP covered species. The purpose for establishing plots at this site was to establish baseline conditions prior to potential creation efforts at Planet Ranch, and use Bill Williams River NWR as a reference site for comparisons of habitat parameters between habitat creation sites and existing habitat that supports breeding for some LCR MSCP covered species.

**Proposed FY12 Activities:** Post-development monitoring will continue using a reduced number of plots. New phases will be monitored annually for 3 years and then every other year in subsequent years. All existing sites (listed above) were monitored in FY10 and FY11; rotation of sites will begin in FY12. Data collection occurs from September through December. Temperature and relative humidity data will continue at 90 locations across the four habitat creation sites in FY12. Marsh monitoring will take place in FY12 at Hart Mine Marsh and Imperial NWR field 18. Soil moisture monitoring will begin in FY12 with a test of protocols and equipment to determine the most efficient and effective way to monitor. Tests will be conducted at PVER.

**Proposed FY13 Activities:** Habitat monitoring including vegetation, microclimate, and soil moisture monitoring will continue in FY13 at habitat creation sites. Vegetation monitoring will continue at Bill Williams River NWR. A full-scale soil moisture monitoring protocol will be developed and implemented based on test design in FY12 and encompass the objectives of 1) determine plant available water across site and soil type, 2) determine rate of infiltration of irrigation water; measured throughout the site, 3) determine movement of irrigation water across fields, and 4) Determine the presence of surface water and near-surface moist soil conditions in areas of >50% canopy closure available for SWFL habitat.

**Pertinent Reports:** Monitoring methods are described in *LCR MSCP Post-Development Habitat Monitoring Methods—2011*, to be posted on the LCR MSCP website, and summaries are included in site development plans for CVCA, PVER, Beal Lake, and Cibola Unit #1 on the website.