

Work Task F1: Habitat Monitoring at Conservation Areas

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$650,000	\$490,889.62	\$4,279,379.33	\$450,000	\$950,000	\$850,000	\$850,000

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Start Date: FY05

Expected Duration: FY55

Long-Term Goal: Pre- and post-development monitoring

Conservation Measures: MRM2, CLRA1, WIFL1, WRBA2, WYBA3, CRCR2, YHCR2, LEBI1, BLRA1, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, and MNSW1

Location: Beal Lake, Havasu National Wildlife Refuge, Arizona; the Palo Verde Ecological Reserve (PVER), California; the Cibola Valley Conservation Area, Arizona; the Cibola National Wildlife Refuge Unit #1 Conservation Area, Cibola National Wildlife Refuge, Cibola, Arizona; Yuma East Wetlands, Yuma, Arizona

Purpose: The purpose of this work task is to provide post-development monitoring that is necessary to assess the effectiveness of each habitat creation and restoration site. Monitoring will include biotic and abiotic components and will inform 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 the Conservation Area Development and Management (Section E) work tasks. Soil moisture data collected under Work Task E34 was used for analyses performed under this work task. All salinity and soil moisture monitoring performed under Work Task E34 will be performed under Work Task F1 starting in FY17. Data collected under this work task is also used under Work Task C60.

Project Description: Using post-development monitoring, species habitat characteristics will be evaluated. Monitoring data will be used to document progress toward achieving program goals and to provide habitat data for covered species to inform management decisions.

Previous Activities: Five habitat creation sites were monitored in FY10 using different monitoring protocols. In FY11, new protocols were developed and tested in a pilot year study. The protocols included measuring variables such as density, species richness, vegetation structure, ground cover, canopy closure, distance to nearest standing water, and distance to nearest open space. Temperature and relative humidity data were also collected.

An external program review of the vegetation monitoring protocol was conducted in FY12 under Work Task G4 to evaluate if data being collected could be used to assess conservation measure accomplishment. It was found that, under the vegetation monitoring protocol developed over several years, the variability that was known to occur on the sites at various spatial scales was not able to be detected. Recommendations were provided for adjusting the current vegetation monitoring sample design and protocols, including the method chosen for randomization of monitoring plots, the collection of various data that were not tied to management questions, and measurements that were too subjective for inclusion into decisionmaking.

In FY14, the adaptive management recommendations for vegetation monitoring were implemented. Vegetation monitoring was conducted in a spatially randomized approach, targeting areas where the vegetation structure and soils were more consistent with southwestern willow flycatcher and yellow-billed cuckoo habitat characteristics. The Beal Lake Conservation Area, the Cibola National Wildlife Refuge Unit #1 Conservation Area, the Cibola Valley Conservation Area, the PVER, and Yuma East Wetlands were monitored, collecting data on density, vegetation structure, canopy closure, and canopy height.

FY15 Accomplishments: In recent years, light detection and ranging (LiDAR) remote sensing technologies have proven to provide more accurate representations of vegetation in forests; it can be collected quickly during the breeding season without disturbing the covered species, and it is expected to provide higher-quality data at a reduced cost. The study design (developed during FY14) for the inclusion of soil moisture monitoring with the vegetation monitoring strategy was drafted (C60) and implemented. The study plan proposed to evaluate vegetation structures using LiDAR remote sensing techniques combined with soil moisture dynamics monitoring, and a pilot study was conducted in spring and summer in one area known to be occupied by southwestern willow flycatchers (Rockhouse Riparian Demonstration Project near Roosevelt Lake, Arizona) and one area within the PVER with similar habitat characteristics.

Instrumentation was installed at the same sites where LiDAR data were collected to evaluate the soil moisture conditions at both sites. Soil moisture data were analyzed to assess site conditions at both the PVER and the occupied southwestern willow flycatcher location. The analysis concluded that the PVER had similar soil moisture conditions as the occupied southwestern willow flycatcher locations; therefore, the data were used to credit acreage targeted to meet Conservation Measure WIFL1 at the PVER.

FY15 obligations were less than approved due to adaptive management changes to incorporate stratification of monitoring within conservation areas that support the habitat characteristics suitable for southwestern willow flycatchers. Additionally, the costs of acquiring airborne LiDAR remote sensing data have decreased as the technology matures.

FY16 Activities: Long-term habitat monitoring will continue in FY16. LiDAR data will be acquired to assess vegetation characteristics and develop analysis tools (C60). Soil moisture monitoring will continue under Work Task E34 during FY16, but data will be used under this work task to further identify the range of habitat characteristics (vegetation and soil moisture) present at areas occupied by breeding southwestern willow flycatchers.

Proposed FY17 Activities: Incorporating the results from FY16, habitat monitoring will continue in FY17. All salinity and soil moisture monitoring previously covered under Work Task E34 will be performed under this work task starting in FY17.

Pertinent Reports: All prepared Work Task F1 reports are posted on the LCR MSCP Web site. During the development of remote sensing vegetation monitoring techniques, annual reports for FY15–17 will not be prepared. Once remote sensing monitoring techniques are finalized, the reports will then be prepared annually.