

## Work Task C60: Habitat Manipulation

FY13 Estimate	FY13 Actual Obligations	Cumulative Expenditures Through FY13	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
\$100,000	\$58,428.29	\$58,428,29	\$100,000	\$100,000	\$150,000	\$200,000

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**Start Date:** FY13

**Expected Duration:** FY18

**Long-term Goal:** Develop cost-effective management techniques and determine timing and extent of management actions necessary for maintaining structural diversity in riparian habitats.

**Conservation Measures:** MRM2, WIFL, and YBCU

**Location:** All current and future riparian LCR MSCP Conservation Areas.

**Purpose:** Identify riparian habitat areas in need of structural diversity enhancement and develop protocols to manage portions of LCR MSCP habitat creation sites. The intent is to use the results of this research to appropriately manage these successional stages of riparian habitat that are required by several covered riparian avian species, and thereby meet established management guidelines.

**Connections with Other Work Tasks (past and future):** Post-development habitat monitoring data obtained in F2 and F3 will be used.

**Project Description:** The LCR MSCP riparian habitat creation sites are planted densely in order to reduce invasive species competition with native species and provide habitat for covered avian species. In natural systems where periodic flooding is a component of the system, portions of the habitat can be periodically disturbed and “reset” to earlier successional stages and increased structural diversity. Several covered avian species require as habitat early to mid-successional stages of native riparian trees. Over time, some of the LCR MSCP riparian habitat creation sites may grow beyond suitable habitat for some covered species unless management actions are taken.

Without the disturbance events that were once more common in the historic river hydrograph, direct manipulation of portions of these conservation areas may be required. This research project will provide information to perform assessments and provide protocols to guide the deliberate manipulations of these habitats to enhance structural diversity and produce the appropriate serial stages for covered species.

The objectives of this study are to:

1. Provide a protocol for assessing areas for structural diversity and target areas that may require enhancement to meet management objectives. This will typically result in identifying areas have at least eight years of growth and that comprise more monotypic stands of riparian trees; however, the protocols that are developed may indicate longer or shorter durations based on measures of structural diversity.
2. Provide a protocol to guide cost-effective and appropriate manipulations of identified riparian habitats in order to reset portions of these areas to the earlier successional stages. Protocols that may be established could include, but are not limited to: locations within stands for thinning, numbers or percent of trees per stand to be removed, height at which trees should be cut to encourage stump sprouting, and potential for in-planting in thinned areas to encourage species diversity as well as longer-term structural diversity.
3. Determine the timing and extent of manipulation necessary for maintaining multi-successional riparian habitat at the appropriate scale. Based on the collected data from this research, potential areas and extent of manipulation for future areas may be predicted so that proper timing and budgeting for management can be more controlled and proactive. Funds for actual management action for conservation areas will be provided through each specific conservation area's work plan.

**Previous Activities:** N/A

**FY13 Accomplishments:** Since the Conservation Areas are relatively young and undergoing rapid changes, manipulation of the habitat may be premature at this time. However, development of appropriate tools that are ready for implementation in anticipation that these tools will be needed in the future for maintaining structural diversity at the sites is recommended.

A literature review was completed and preliminary protocol development has begun. Current relevant literature on riparian stand thinning/manipulations was reviewed to determine the best approaches for achieving the desired habitat structure and determine the measured parameters needed to indicate success. Information from the literature regarding best approaches for assessing habitat diversity in different structure types may be employed to identify study sites with low structural diversity, and or those with later successional stages of growth. A supplemental literature review was conducted on the habitat requirements and limitations for the southwestern willow flycatcher, and yellow-billed cuckoo. The addition of species habitat parameters were needed to assist in defining what vegetation parameters to collect data on that may be manipulated. This review was also used to develop conceptual ecological models for both species. See Work Task G4 for more specifics.

Following the literature review, two avenues were investigated to assess structural diversity; field based methods and the analysis of remote sensing (LIDAR) data. Either

method yield measures of the number of vegetation layers, and their relative heights at one point within the plot. Statistical tools are being developed to assess the diversity, at multiple spatial scales (e.g., plot, patch, restoration area) of this vegetation data.

The field methods being tested are based on protocols developed by MacArthur and Horn (1969), where the height of all vegetation layers is measured. The current methods use a laser-rangefinder to measure the distance from the ground to the vegetation at 200 points within an approximately 80-m<sup>2</sup> plot. These plots are located in a stratified random pattern within each restoration area.

Data were collected in four plots in PVER 3 and PVER 5. Limited data were collected in FY13, reducing expenditures.

**FY14 Activities:** The field method testing will continue. Following field method testing, the data collected will be used to investigate the power of the developed indices to describe structural diversity. LIDAR-based methods will be tested following acquisition of site data.

**Proposed FY15 Activities:** A pilot monitoring protocol will be developed following assessment of the two methods. Potential management tools will be identified for further evaluation. Further research will be conducted on the feasibility of implementing habitat management strategies when conditions within created habitat warrant their use.

**Pertinent Reports:** N/A