Work Task C60: Habitat Manipulation

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
$100,000	$64,680.00	$71,952.56	$100,000	$225,000	$225,000	$200,000

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Start Date: FY13

Expected Duration: FY20

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, YBCU, CLRA1, BLRA1, and LEBI1

Location: All current and future riparian LCR MSCP conservation areas

Purpose: The purpose of this work task is to 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): Research and monitoring data obtained from Work Tasks D1, D2, D3, F1, F2, F7, G3, and G4 are 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. Information will be provided to not only perform assessments but to provide protocols, which will guide the deliberate manipulation of these habitats to enhance structural diversity and produce the appropriate seral 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 that have at least 8 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. The funds for actual management action for conservation areas will be provided through each specific conservation area's work plan.

Previous Activities: Since the conservation areas are relatively young and undergoing rapid changes, manipulation of the habitat may be premature at this time; however, development of tools for future use to maintain structural diversity is recommended.

In FY13, a literature review was completed on riparian stand thinning/ manipulations to determine the best approaches for achieving the desired habitat structure and determine the measured parameters needed to indicate success. The best approaches for assessing habitat diversity in different structure types were tested 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 was needed to assist in defining what vegetation parameters could be manipulated.

Following the literature review, two avenues were investigated to assess structural diversity: (1) field-based methods and (2) the analyses of remote sensing (LiDAR) data. Both methods yielded measures of the number of vegetation layers and their relative heights at one point within the plot. Additionally, statistical tools have been developed to assess the diversity of this vegetation data at multiple spatial scales (e.g., plot, patch, restoration area, etc.).

FY14 Accomplishments: Following the literature review from FY13, a pilot assessment was conducted to evaluate structural diversity with a field-based method and the analysis of LiDAR data. Both methods yielded measures of the number of vegetation layers and their relative heights at one point within a plot. The field-based method was tested with the collection of vegetation (layer) heights within various areas of high density vegetation. These plots were located in a stratified random pattern within each restoration area. The evaluation of LiDAR data began in FY14 and is expected to continue in FY15.

FY15 Activities: Field method testing will continue, and following testing, the data collected will be used to investigate the power of the developed indices to describe structural diversity. A pilot monitoring protocol will be developed following assessment of the field-based and LiDAR methods. Statistical geographic tools continue to be developed to assess the diversity at multiple spatial scales (e.g., plot, patch, restoration area, etc.) of these vegetation data.

Proposed FY16 Activities: The pilot monitoring protocol will be tested following assessment of the field-based and LiDAR methods. Potential management tools will be identified for further evaluation. Additional research will be conducted on the feasibility of implementing habitat management strategies when conditions within created habitat warrant their use.

Changes in the hydrologic regime along the LCR have reduced the likelihood of marsh habitat being refreshed though active periods of flooding and removal of the vegetation structure. The covered marsh bird species thrive in marshes that function with ephemeral flooding and resetting of the habitat. Without flooding, active restoration and management of these marsh habitats is expected throughout the life of the program. The current literature suggests that burning of the marshes' decadent dry material allows for new habitat to emerge.

Like the proposed riparian habitat manipulation study that began in FY13, in FY16, literature searches will begin, and a study plan will be developed to address the following objectives:

1. Provide a protocol for assessing areas at various spatial scales that are no longer providing the optimum habitat for the covered marsh birds

2. Provide a protocol to guide cost-effective and appropriate manipulations of marsh in order to reset portions of these areas to the earlier successional stages

3. Determine the timing and extent of the manipulation necessary for maintaining a mosaic of a functioning marsh

Pertinent Reports: N/A