Work Task C55: Techniques to Increase Leaf Litter Decomposition Rates

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
$0	$0	$0	$125,000	$75,000	$75,000	$75,000

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Start Date: FY13

Expected Duration: FY17

Long-term Goal: Develop techniques to reduce litter biomass.

Conservation Measures: MRM2, CMM1 (WIFL, YBCU, ELOW, GIFL, GIWO, VEFL, BEVI, YWAR, SUTA).

Location: Palo Verde Ecological Reserve.

Purpose: To evaluate if a reduction in accumulated leaf litter and fuel load is needed, and to develop tools to reduce the accumulated litter. In many of the LCR MSCP habitat creation sites there is a buildup of dead vegetation and leaf litter that contributes to fuel loads at LCR MSCP habitat creation sites, which could eventually become a fire hazard.

Connections with Other Work Tasks (past and future): Post-development habitat monitoring will be conducted at habitat creation sites detailed in work tasks F1-F5; fire management plan under E18; create and manage a mosaic of native land cover types under E4.

Project Description: Leaf litter decomposition is a fundamental source of energy and nutrients in forested ecosystems and is historically investigated for its role in nutrient cycling. The process begins as leaf litter accumulates; organisms colonize the litter and begin the decomposition process resulting in humus formation. Nutrient cycling and litter decomposition are understudied in restored habitat especially restored riparian systems that do not undergo the same floodplain processes as natural riparian communities. At some MSCP habitat creation areas, litter has accumulated in the absence of natural flooding regimes and may pose a fire risk. The MSCP is interested in evaluating the litter and soil communities (e.g. microfauna and macrofauna, and microbiota) at select habitat creation sites to determine which litter/soil species are present and their abundances. An examination of the soil biota is needed in conjunction with litter biota as these communities are interrelated. In addition to potential fuel reductions, benefits from breaking down the leaf litter include, an increase in soil nutrients, organic matter, and microorganisms essential for a healthy forest floor environment.

The purpose of this study is to evaluate soil and litter species richness and composition from mixed and single species leaf litter at LCR MSCP conservation areas. With these results, an analysis of conditions at the sites will be prepared that will identify if the litter and soil communities support the appropriate species and abundances to effectively decompose the leaf litter.

Tools will be investigated to increase litter/soil biota and thus reduce litter biomass, if necessary. One method that will be tested is by adding biological compost tea (BCT) to the litter to improve the biotic communities, thus increasing litter decomposition. This task would include determining the proper BCT recipe, testing at least two application methods (including incorporating the BCT into the litter layer), and monitoring plots before and after BCT treatment.

Previous Activities: N/A

FY12 Accomplishments: New start in FY13.

FY13 Activities: A literature search will be conducted to gather information on existing studies related to litter, nutrient and soil quality. A project outline and research proposal will be developed for including preparing a study design to determine soil and litter species richness and composition from mixed and single species leaf litter at MSCP conservation areas. Once complete, the fieldwork will begin.

Proposed FY14 Activities: Fieldwork will continue to be collected on litter species richness and composition from various conservation areas. Data will be analyzed to evaluate soil and litter communities at the associated conservation areas. A report will be written to recommend what tools (including BTC), if any, will be tested.

Pertinent Reports: N/A