

Work Task C42: Experiments and Demonstration of Soil Amendments for Use in Restoration Sites

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$200,000	\$6,542.58	\$458,429.71	\$0	\$0	\$0	\$0

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Start Date: FY10

Expected Duration: Closed FY14

Long-Term Goal: To assess the feasibility of using soil amendments to improve water retention of restored habitat and assess management options for irrigation of habitat restoration sites

Conservation Measures: MRM1 (WIFL, YBCU, ELOW, SUTA, GIWO, GIFL, VEFL, YWAR, and BEVI)

Location: BLCA on the Havasu NWR

Purpose: The purpose of this work task is to explore the use of soil amendments, alternative site preparation, and irrigation methods to maintain moist soils and/or standing water within habitats created for the southwestern willow flycatcher and improve germination of willow seed. Habitat conditions for other covered species will also be improved by maintenance of moist soil conditions. Improving low-quality soils will also improve water conservation and lower irrigation costs. This work will parallel species habitat and hydrology studies. The information will be used by Project Managers during site preparation and by land managers to create and maintain habitat with enough standing water and/or moist soils to replicate the structural characteristics of vegetation and microclimate found at occupied flycatcher habitat.

Connections with Other Work Tasks (Past and Future): Initial literature searches and laboratory studies were conducted under Work Task G3. A seed feasibility study was conducted under Work Task E24, and outcomes from that research will be used in conjunction with the soil amendment to determine if the amendment will bolster willow production from seed.

Project Description: The soil amendment Lassenite Pozzolan was identified as a possible product for improving water retention and irrigation practices of sandy soils after a review of soil amendments and their associated costs, availability, and water retention capabilities. Although the material has been

tested for use on golf courses in desert environments, there are several differences in the use proposed by Reclamation that require further examination. Application demonstrations are being conducted onsite at the BLCA, where sandy soil conditions exist.

The purpose of the field study is to determine if the addition of Lassenite Pozzolan to sandy soils has a positive effect on germination, survival, and growth of dense willow habitat from seed. The field study describes how smaller plots will be treated with higher percentages of the soil amendment to determine if the product increases soil moisture retention between irrigations. Both dense willows and moist soils may be used by nesting southwestern willow flycatcher.

Previous Activities: In 2007, under Work Task G3, a literature and product search was conducted to gather information on soil amendments for use in habitat restoration projects. This information was provided in a report finalized in 2007. In 2008–09, additional information was gathered on Lassenite Pozzolan, and a study proposal was written.

In FY10, laboratory work was completed to test the feasibility of Lassenite Pozzolan for restoration purposes, including movement of the product through a soil profile, application rates and soil moisture retention, and facilitation of water movement. Laboratory testing showed the product was useful in increasing water movement and moisture retention.

In FY12, the experimental design and study plan was finalized to further test the soil amendment under field conditions at BLCA on the Havasu NWR. Goodding's willow seed was collected for hydroseeding 8 acres, and 179 Fremont cottonwoods were acquired to establish a windbreak around the study site.

In FY13, the fields at the BLCA were prepared for planting by flushing salts from the soils, clearing vegetation, tilling, leveling, and furrowing. All instrumentation was installed to monitor irrigation. The fields were hydroseeded with Goodding's willow in April 2013. Monitoring of vegetation and soil moisture was conducted throughout the growing season. Vegetation monitoring results showed that willow seed germination was not significantly improved by high percentages of Lassenite Pozzolan added to the soils. However, soil surface moisture was retained longer in plots with at least 25% of the soil amendment. This product is no longer commercially available, so the remaining study objectives could not be completed.

FY14 Accomplishments: A final report was completed, and this work task was closed in FY14.

FY15 Activities: This work task was closed in FY14.

Proposed FY16 Activities: This work task was closed in FY14.

Pertinent Reports: A final report will be posted on the LCR MSCP Web site upon completion.