

Work Task E8: Seed Feasibility Study

FY05 Estimate	FY05 Actual	Cumulative Accomplishment Through FY05	FY06 Approved Estimate	FY07 Proposed Estimate	FY08 Proposed Estimate	FY09 Proposed Estimate
\$92,000	\$4,000	\$4,000	\$150,000	\$160,000	\$177,000	\$15,000

Contact: Barbara Raulston, (702) 293-8788

Start Date: FY05 **Expected Duration:** FY09

Long-Term Goal: Restoration research

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

Location: Reach 4, Cibola National Wildlife Refuge, ½ mile east of River Mile 97, AZ

Purpose: This research project documents the feasibility of establishing native riparian habitat (cottonwood, willow, and other native groundcovers and shrubs) from seed to potentially increase the cost-effectiveness and quality of future habitat creation projects.

Connections with Other Work Tasks (past and future): This Work Task was previously included in the Draft FY05 Work Tasks as a portion of Farm Unit #1 (Genetics, Mass Planting, Seed), Cibola National Wildlife Refuge (E6). Many different planting techniques (seeding, various sized cuttings, various sized container plants), irrigation methods (sprinkler, flood, drip), and management activities (weed control, cutting, pruning, re-planting) have been demonstrated through Section E Work Tasks, with varying degrees of success. This study will take one of these methods, seeding for native riparian plants, and apply strict scientific methods to determine the usefulness to future LCR MSCP projects.

Project Description: Through a series of laboratory and field experiments, this study will document the necessary steps involved in using seed to create dense mosaics of native riparian land covers. Steps in the process include seed collection, storage, treatment, planting, germination, and seedling growth and survival. Using seeds in lieu of, or in conjunction with, cuttings may be feasible if it involves less labor, is more cost effective, and/or preserves the genetic diversity of the riparian habitat created under the LCR MSCP. The amount of non-native to native vegetation resulting from using seed for restoration will also be an important factor in determining the feasibility of this method. The preferred outcome of this study will be a series of protocols, developed from careful documentation, which can be used to create native riparian habitat.

Reclamation has entered into a 5-year land use agreement with the FWS to conduct restoration research in Farm Unit #1 at Cibola NWR. The agreement expires in FY09; at which point a decision will be made to continue research activities, manage land cover types as habitat created during the research for the 50-year life of the LCR MSCP, or discontinue funding.

Previous Activities: Preliminary investigations during Work Task E1 indicate that using seed for restoration warranted additional study.

FY05 Accomplishments: Market research to determine vendor availability was conducted in February 2005. Between February and June 2005, additional contracting issues were explored, including the type of contract to be used. From July to September 2005, a determination for a research and development contract was made, a Scope of Objectives was finalized, a requisition with an estimate of \$400,000 for a 3-year study was developed, and a solicitation for this work was posted. Only a small portion of the estimated FY05 budget was expended.

FY06 Activities: A contract entitled *Feasibility Study Using Native Seeds in Restoration* was awarded in March 2006. Seeds have been collected from Cibola NWR and are currently being used in a series of experiments in a greenhouse and laboratory. Under controlled conditions, these experiments will determine germination rates, growth, and survival, as affected by seed collection, storage, seed treatment, planting method, planting density, soil type, irrigation, and soil treatments. Longevity will be tested by conducting germination trials every two weeks after collection.

Proposed FY07 Activities: Based on successful seeding methods and soil amendments from previous experiments in the lab and greenhouse, larger test plots will be planted on-site at Cibola NWR, to measure and document factors and conditions for successful germination, growth, and survival.

Pertinent Reports: A study plan is available on request. Annual reports will be posted on the LCR MSCP website.



Figure E8a: May 2006 seed collecting Cibola NWR



Figure E8b: May 19, 2006 these were grown from seeds in less that 2 weeks in the greenhouse.