

Work Task C27: Small Mammal Population Studies

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
\$70,000	\$42,984.20	\$301,028.84	\$50,000	\$50,000	\$0	\$0

Contact: Allen Calvert, (702) 293-8311, acalvert@usbr.gov

Start Date: FY08

Expected Duration: FY13

Long-term Goal: Determine distribution, genetics, habitat requirements, and establish monitoring protocol of covered small mammal species.

Conservation Measures: CRCR1, YHCR1.

Location: Reaches 3 through 7 from Davis Dam to the Southerly International Boundary with Mexico.

Purpose: Implement distribution, habitat, and genetics studies for system monitoring of LCR MSCP covered small mammal species. These studies are being conducted to determine geographic range limits of the Yuma hispid cotton rat and the Colorado River cotton rat, and to determine habitat requirements for these species. Data will be used through the adaptive management process to coordinate surveys of habitat creation sites and design habitat for covered mammal species.

Connections with Other Work Tasks (past and future): Data collected as part of Small Mammal Colonization (F3) will also be analyzed as part of the effort to determine species distribution of the two cotton rat species found along the LCR. Previous presence/absence surveys on small mammal populations were conducted under D10. This research will aide in developing a long term population monitoring protocol for small mammals and develop a habitat model for the two cotton rat species that can be used in restoration efforts (Section E) and adaptive management (Section G).

Project Description: Studies will be designed to determine the habitat usage, population status, genetic differentiation, and distributional range of two covered small mammal species: the Colorado River cotton rat and Yuma hispid cotton rat. Small mammals will be trapped in various habitat types along the LCR to collect genetic samples. Samples will be sent to a genetics laboratory for DNA analysis. Genetic differentiation data for animals captured along the LCR will also be compared with data from animals of different subspecies located within Arizona, east of the LCR MSCP planning area, to obtain genetic markers. These data will be used to compare and contrast specific subspecies and determine the distributional range of each species of cotton rat within the LCR watershed. Habitat use and population demographic analyses are currently being estimated with mark-recapture analyses. A habitat model and population

demography study will be implemented to determine habitat usage and establish a protocol for population monitoring at conservation areas.

Previous Activities: *Sigmodon* have been captured at seven localities along the LCR, including sites near Yuma, Arizona, Imperial NWR, Cibola NWR, PVER, and Pintail Slough on Havasu NWR. A study was initiated at the end of FY07 to determine genetic differentiation between covered small mammal species, distributional range for each species, and habitat usage along the LCR. In FY08, additional efforts were made to identify cotton rat populations, including sampling known populations along the LCR. Distribution and population genetic analyses have been conducted for these covered species. Population monitoring and habitat model development research began in FY10.

FY11 Accomplishments: Trapping grids continued at three sites including Cibola NWR Unit #1 Nature Trail, PVER, and Pintail Slough on the Havasu NWR. A mark-recapture study designed to quantify structural components of habitat use and survival of the three populations is underway. Data are being collected in spring and fall. Preliminary analyses suggest two sites have high population survival while one has low survival. Habitat characteristics differ between the three sites and are likely correlated to survival probability of the local population. Preliminary habitat models indicate there are several structural components that may be important to predicting *Sigmodon* use of an area. These include depth of litter and vertical density measurements.

FY12 Activities: Vegetation/habitat data collection finished in the fall of 2011. Mark-recapture data will continue to be collected at the three sites and may be expanded as additional populations become established at habitat creation areas. Because there was insufficient data to complete appropriate statistical analysis, data will be collected for one more year. A complete analysis of the habitat characteristic part of the study will begin. A population monitoring protocol for *Sigmodon* is being developed with the demographic and capture data generated here and under D10 and F3.

Proposed FY13 Activities: Continue population/demography monitoring design and research. Long term datasets are necessary for this species because of drastic population cycles which may have short-term local effects on the population. A complete analysis of the habitat characteristic part of the study will be completed and a long term protocol for the population/demography portion of the study will be finalized.

Pertinent Reports: The final report, *Colorado River & Yuma Hispid Cotton Rat Distribution and Habitat*, is available on the LCR MSCP website. The habitat modeling and population monitoring study design is available upon request.