

Work Task C27: Small Mammal Population Studies

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$50,000	\$39,890.93	\$391,012.43	\$50,000	\$0	\$0	\$0

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Start Date: FY08

Expected Duration: FY15

Long-Term Goal: Identify distribution, genetics, and habitat requirements, and establish monitoring protocols for covered small mammal species

Conservation Measures: CRCR1, YHCR1, DEPO1, MRM1, and MRM2

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

Purpose: The purpose of this work task is to implement distribution, habitat, and genetics studies for monitoring of LCR MSCP covered and evaluation small mammal species. These studies are being conducted to clarify the geographic range of the Yuma hispid cotton rat and the Colorado River cotton rat along the LCR, identify ways to differentiate subspecies of desert pocket mouse, and to describe habitat characteristics for these species.

Connections with Other Work Tasks (Past and Future): Data collected as part of Work Task F3 will be analyzed as part of the effort to determine the distribution of the two cotton rat species found along the LCR. Previous presence/absence surveys on small mammal populations were conducted under Work Task D10. This research will inform improvements to the monitoring protocol for small mammals.

Project Description: Studies will be designed to identify the habitat use, genetic differentiation, and distributional range of the covered and evaluation small mammal species. Small mammals will be trapped in various habitat types along the LCR to collect genetic samples, and the 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 clarify the distributional range of each species of cotton rat and identify genetic markers that can differentiate subspecies of the desert pocket mouse within the LCR watershed. Habitat use and

population demographics will be estimated with mark-recapture analyses. A population demography study will be implemented to identify habitat at cotton rat capture locations and establish a protocol for monitoring cotton rat presence at conservation areas.

Previous Activities: Cotton rats were captured at seven localities along the LCR, including sites near Yuma, Arizona; Imperial NWR; Cibola NWR; PVER; and Pintail Slough on the Havasu National Wildlife Refuge (Havasu NWR). A study was initiated at the end of FY07 to determine genetic differentiation between covered cotton rat species, distributional range for each species, and habitat use along the LCR (D10 and F3). In FY08, the study was moved under Work Task C27 in which 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 and habitat monitoring began in FY10. From FY11 to FY13, field work for a combined mark-recapture and habitat study was conducted using trapping grids that had different population densities of Colorado River cotton rats at Pintail Slough, Cibola NWR Nature Trail, and the PVER.

FY14 Accomplishments: Work began on the small mammal monitoring plan, and field work for the mark-recapture/habitat study was completed. Data suggest that cotton rats need dense herbaceous vegetation at least 0.5 meter in height, as it provides an important cover for their activities and protects them from predators. Areas with this habitat structure often had better trapping success as well. These results and methods were reviewed, and protocol improvements were identified in vegetation measurements and data analyses. These improvements will be incorporated into future monitoring efforts.

Genetic samples of both cotton rats and desert pocket mouse were submitted for Next-Gen sequencing to identify genetic markers that can be used to differentiate the cotton rat species and the subspecies of the desert pocket mouse, analyze the species' ranges, and, potentially, population connectivity.

FY14 obligations were under budget, as less field work was required this fiscal year.

FY15 Activities: The habitat and population study report and a draft of the small mammal long-term monitoring plan will be completed. Nex-Gen sequencing results will be completed for the desert pocket mouse, Colorado River cotton rat, and Yuma hispid cotton rat. The results will be reviewed to see if additional genetic analyses are needed to inform LCR MSCP conservation efforts.

Proposed FY16 Activities: This work task was closed in FY15.

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