

## Work Task C27: Small Mammal Population Studies

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$50,000	\$39,005.31	\$438,705.18	\$40,000	\$0	\$0	\$0

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

**Start Date:** FY08

**Expected Duration:** FY16

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

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

**Location:** Reaches 3, 4, 6, and 7

**Purpose:** The purpose of this work task is to implement distribution, genetic, and habitat studies for monitoring 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 lower Colorado River (LCR), identify ways to differentiate subspecies of desert pocket mouse, and to describe habitat characteristics of 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 distributional range, genetic differentiation, and habitat use 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 deoxyribonucleic acid (DNA) analyses. 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. The 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 National Wildlife Refuge; Cibola National Wildlife Refuge; Palo Verde Ecological Reserve; and Pintail Slough on the Havasu National Wildlife Refuge. A study was initiated at the end of FY07 to determine the distributional range for each species, the genetic differentiation between the covered cotton rat species, and their 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, the Cibola National Wildlife Refuge Unit #1 Conservation Area Nature Trail, and the Palo Verde Ecological Reserve. 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.

**FY15 Accomplishments:** The final report was revised. Genetic samples of both cotton rats and the desert pocket mouse were sequenced using Next-Gen to identify genetic markers that can be used to differentiate the cotton rat species and the subspecies of the desert pocket mouse. The Next-Gen data are now available for researchers interested in pursuing studies that are outside the scope of the LCR MSCP, such as analyzing the species' ranges and population connectivity.

FY15 obligations were under budget, as no field work was required that fiscal year.

**FY16 Activities:** The data will be incorporated into the LCR MSCP database, and the work task will be closed in FY16.

**Proposed FY17 Activities:** This work task will be closed in FY16.

**Pertinent Reports:** The report titled *Habitat and Population Demographics of the Colorado River Cotton Rat (*Sigmodon arizonae plenus*) Along the Lower Colorado River* will be posted on the LCR MSCP Web site upon completion.