



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

System Monitoring of Rodent Populations

2011 Annual Report



September 2016

Lower Colorado River Multi-Species Conservation Program Steering Committee Members

Federal Participant Group

Bureau of Reclamation
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
Bureau of Indian Affairs
Western Area Power Administration

Arizona Participant Group

Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
Central Arizona Water Conservation District
Cibola Valley Irrigation and Drainage District
City of Bullhead City
City of Lake Havasu City
City of Mesa
City of Somerton
City of Yuma
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Mohave Valley Irrigation and Drainage District
Mohave Water Conservation District
North Gila Valley Irrigation and Drainage District
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Salt River Project Agricultural Improvement and Power District
Unit "B" Irrigation and Drainage District
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users' Association
Yuma Irrigation District
Yuma Mesa Irrigation and Drainage District

Other Interested Parties Participant Group

QuadState Local Governments Authority
Desert Wildlife Unlimited

California Participant Group

California Department of Fish and Wildlife
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Coachella Valley Water District
Colorado River Board of California
Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
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Southern Nevada Water Authority
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Hualapai Tribe
Colorado River Indian Tribes
Chemehuevi Indian Tribe

Conservation Participant Group

Ducks Unlimited
Lower Colorado River RC&D Area, Inc.
The Nature Conservancy



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ACRONYMS AND ABBREVIATIONS

LCR	lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
PIT	passive integrated transponder
Reclamation	Bureau of Reclamation

Symbols

>	greater than
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INTRODUCTION

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a partnership of Federal and non-Federal stakeholders that was created to respond to the need to balance the use of lower Colorado River (LCR) water resources and the conservation of native species and their habitats in compliance with the Endangered Species Act. It is a long-term (50-year) plan to conserve at least 26 species along the LCR from Lake Mead to the Southerly International Boundary with Mexico through implementation of a Habitat Conservation Plan. Implementation of the LCR MSCP began in October 2005. Implementing the LCR MSCP will create at least 8,132 acres of new habitat (5,940 acres of cottonwood-willow (*Populus fremontii*, *Salix gooddingii*) 1,320 acres of honey mesquite (*Prosopis glandulosa*), 512 acres of marsh, and 360 acres of backwater) and produce 660,000 subadult razorback suckers and 620,000 bonytail to augment the existing populations of these fishes in the LCR.

Twenty-six Federal or State-listed candidate and sensitive species and their associated habitats, ranging from aquatic and wetland habitats to riparian and upland areas, are covered under the LCR MSCP. This includes the Colorado River cotton rat (*Sigmodon arizonae plenus*) and Yuma hispid cotton rat (*Sigmodon hispidus eremicus*). The desert pocket mouse *sobrinus* subspecies (*Chaetodipus penicillatus sobrinus*) is being evaluated to determine if it should be added as a covered species.

Of the habitat to be created, 125 acres have been designated for the Colorado River cotton rat, and 76 acres have been designated for the Yuma hispid cotton rat. It is currently believed that the range of these two species does not overlap. Those captured south of the Trigo and Chocolate Mountains in the area of the Imperial National Wildlife Refuge and south to the Yuma, Arizona, area to date are Yuma hispid cotton rats. Those captured north of the aforementioned mountain ranges to date are Colorado River cotton rats. The northernmost historic records of the Colorado River cotton rat are from an area just south of Laughlin, Nevada (Hall 1946; Bradley 1966). Currently, the Bureau of Reclamation (Reclamation) has not found this species farther north than the Havasu National Wildlife Refuge near Needles, California.

Desert pocket mice occur in creosote bush (*Larrea tridentata*) and xeric riparian communities of the Southwest, from Baja California, Mexico, in the south and southeastern California, southern Nevada, and extreme southwest Utah in the North. The range of the *sobrinus* subspecies is not well documented. Its range along the LCR is assumed to be in Reaches 1-3, from Lake Mead south to Parker Dam.

Reclamation is increasing its understanding of restoration science through an adaptive management approach; therefore, monitoring of habitat creation/restoration sites is crucial. Species presence at existing habitat along the LCR and at LCR MSCP conservation areas is being monitored under LCR MSCP Work Task D10 (System Monitoring of Rodent Populations) and Work Task F3

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(Small Mammal Colonialization of Conservation Areas). In addition, LCR MSCP Work Task C27 (Small Mammal Population Studies) is being conducted to identify distribution, genetics, and habitat requirements, and to establish monitoring protocols for the covered small mammal species.

STUDY AREAS



Figure 1.—Map of overall study area with trapping locations listed.

Pintail Slough

Pintail Slough is located in the southeastern portion of the Havasu National Wildlife Refuge (figure 2). The site is within Reach 3. The vegetation consists of a dense area of Mexican devil weed (*Chlorocantha spinosa*) intermixed with mule fat (*Baccharis salicifolia*), Johnsongrass (*Sorghum halapense*) and Bermudagrass (*Cynodon dactylon*). Data collected at Pintail Slough is also being included in LCR MSCP Work Task C27 Small Mammal Population Studies report.

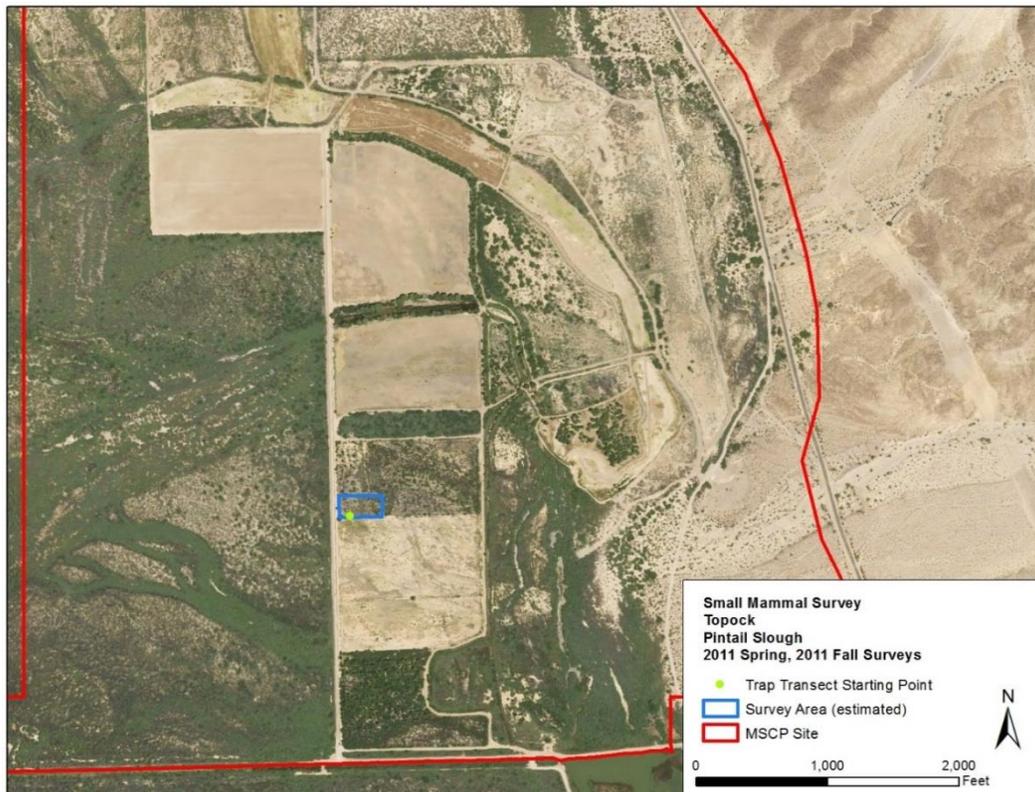


Figure 2.—Map of survey area in Pintail Slough.

Palo Verde Irrigation District North: Olive Lake

Olive Lake is located about 5 miles (8 kilometers) north of Blythe, California, along the California side of the Colorado River (see figure 1) in Reach 4 opposite the levee road to Phase 4 of the Palo Verde Ecological Reserve (figure 3), a LCR MSCP conservation area. The site is subject to periodic inundation and is dominated by Spanish false fleabane (*Pulicaria paludosa*), interspersed Bermuda grass, and dallisgrass (*Paspalum dilatatum*). A population of Colorado River cotton rats has been documented on the island since 2009. There has been a decrease in population density since initial detection, most likely due to changes in vegetation structure as well as removal of vegetation and land grading

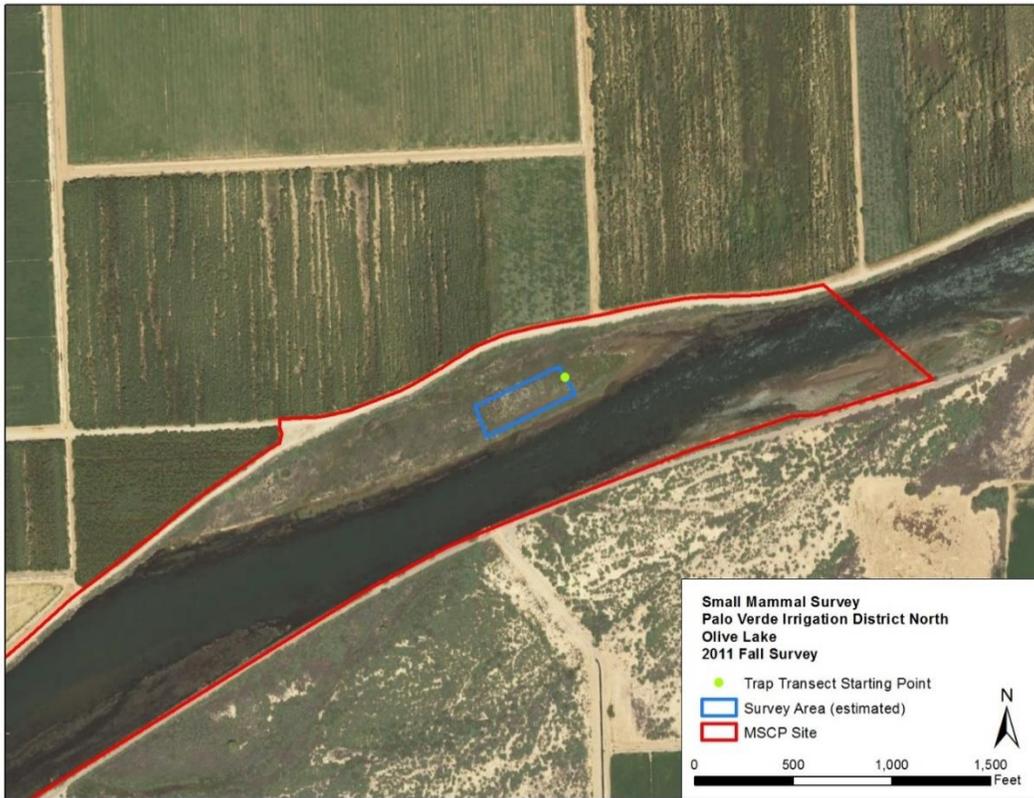


Figure 3.—Map of survey area at Olive Lake.

associated with developing restoration sites in nearby Palo Verde Ecological Reserve plots. Captures in Olive Lake will also be included in the LCR MSCP Work Task C27 Small Mammal Population Studies report.

METHODS

Trapping focused on areas of each site where Colorado River cotton rat and Yuma hispid cotton rat presence was most likely. This involved selecting sites based on the presence of dense grasses and ground cover as found in the previous 5 years of trapping data and other studies along the LCR and elsewhere (Andersen and Nelson 1999). Once the densest habitats had been sampled, other less densely vegetated habitats were sampled. The goal of this project is to determine if Colorado River cotton rats and Yuma hispid cotton rats are present in an area and not to establish a systematic unbiased sample on the restoration sites. All other captures are incidental to the main focus; therefore, the numbers of individuals of each species (including cotton rats) reported here should be interpreted with caution. Because the focus of this effort is to find cotton rats, areas where it would be highly unlikely to find them were not trapped. These areas include bare ground and under dense, high (> 5 meters) tree canopy.

Sherman live traps were used, which are triggered by an animal stepping on a pressure plate that then closes a trap door behind the animal. Traps were set out in transects of 30 traps per transect at 10-meter intervals, with two traps per station. At Palo Verde Irrigation District North: Olive Lake, four transects were established. At Pintail Slough, because trap success was considerably lower, five transects were used to increase the number of captures per night. The traps were run for 3–4 nights at each locality and were baited with a mixture of oats, peanut butter, and vanilla. A small handful of cotton was also added to each trap to provide insulating cover for any animal trapped overnight.

Traps were set out in the afternoon and collected the following morning after sunrise. Captured animals were transferred into a clear plastic bag and identified to species. Animals were identified using a key of local small mammal species from the Mammals of California field guide (Jameson and Peeters 2004), and Hoffmeister (1986). Field notes were recorded in a data sheet or notebook and include at a minimum: the location of transects, what ground cover/macrohabitat was found in the trapping area, the number of transects and traps, and the number of each species captured. Voucher specimens were taken the first time Colorado River cotton rats and Yuma hispid cotton rats were recorded in the area (the first historical occurrence). All other animals were released back into the trapping area once identification was made.

RESULTS

Pintail Slough

A total of six Colorado River cotton rats (table 1) were captured over 840 trap-nights in 2011. All Colorado River cotton rats captured were passive integrated transponder (PIT) tagged and will also be included in the Work Task C27 Small Mammal Population Studies report.

Table 1.—Summary of captures at Pintail Slough

Species	Spring 2011	Fall 2011
Colorado River cotton rat	3	3
Cactus mouse (<i>Peromyscus eremicus</i>)	43	38
Deer mouse (<i>Peromyscus maniculatus</i>)	20	17
Desert pocket mouse (<i>Chaetodipus penicillatus</i>)	1	0
Western harvest mouse (<i>Reithrodontomys megalotis</i>)	0	23
House mouse (<i>Mus musculus</i>)	0	1
Merriam's kangaroo rat (<i>Dipodomys merriami</i>)	1	5
White-throated wood rat (<i>Neotoma albigula</i>)	6	5
Total captures	74	92
Traps/nights	120/3	120/4

Palo Verde Irrigation District North: Olive Lake

A total of 128 Colorado River cotton rats (table 2) were captured over 480 trap-nights in 2011. All Colorado River cotton rats captured were PIT tagged and will also be included in the Work Task C27 Small Mammal Population Studies report.

Table 2.—Summary of captures at Palo Verde Irrigation District North:
Olive Lake

Species	Fall 2011
Colorado River cotton rat	128
Cactus mouse (<i>Peromyscus eremicus</i>)	15
Deer mouse (<i>Peromyscus maniculatus</i>)	5
Western harvest mouse (<i>Reithrodontomys megalotis</i>)	6
House mouse (<i>Mus musculus</i>)	2
Total captures	156
Traps/nights	120/4

DISCUSSION

High numbers of Colorado River cotton rats were captured in the Olive Lake location during 4 nights of trapping. The site is near the Palo Verde Ecological Reserve and might serve as a source population for future colonization of the conservation area. Low numbers of Colorado River cotton rats were captured in Pintail Slough over two seasons of trapping. The site has a habitat structure that could potentially support populations of the Colorado River cotton rat, and further trapping will continue to determine if their presence persists. One desert pocket mouse was captured at Pintail Slough in spring 2011. It is unknown if this animal was of the *sobrinus* subspecies being evaluated by the LCR MSCP, as the subspecies cannot be determined in the field. Trapping was conducted in areas with suitable structure for Colorado River cotton rats, which is not optimal for desert pocket mice. If additional detections of desert pocket mice are needed to evaluate presence or the range of the *sobrinus* subspecies, trapping may be conducted in xeric areas to increase the likelihood of capturing desert pocket mice.

A goal for system-wide monitoring is to survey the range of potential Colorado River cotton rat and Yuma hispid cotton rat habitat along the LCR and identify Colorado River cotton rat and Yuma hispid cotton rat populations. The last large-scale search for possible Colorado River cotton rat and Yuma hispid cotton rat habitat along the river was completed by Reclamation in 2008. As these rodents

generally occupy an early successional habitat, we see large variability in detection success across trapping seasons. Previously successful sites like Pintail Slough and Olive Lake have had less Colorado River cotton rat captures as the plant community matures. The forthcoming Work Task C27 Small Mammal Population Studies report on Colorado River cotton rat and Yuma hispid cotton rat habitat may identify habitat characteristics that can be used to increase efficiency in detecting Colorado River cotton rats and Yuma hispid cotton rats and inform future decisions for creation of Colorado River cotton rat and Yuma hispid cotton rat habitat.

Captures of Yuma hispid cotton rats are sporadic throughout the range, and a dense population has yet to be found. Further trapping and genetic analyses are to be conducted to help delineate the range boundaries for Colorado River cotton rats and Yuma hispid cotton rats along the LCR.

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