

RECLAMATION

Managing Water in the West

Summary of Preliminary Mammal Trapping Efforts at Cibola National Wildlife Refuge and at the Pratt Agricultural Restoration Site 2004-05

Lower Colorado River Multi-Species Conservation Program

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Abstract

During the winter of 2004-05, the Natural Resources Group of the Lower Colorado Region of the US Bureau of Reclamation initiated a preliminary study of small mammal use of two restoration sites. Two species of *Peryomiscus*, and at least one *Sigmodon spp.*, were captured at both sites. All captures occurred in areas with dense ground cover of *Baccharus spp.* or Johnson grass (*Sorghum halapense*). The presence of *Sigmodon spp.* at both sites may indicate that the cottonwood/willow and mesquite restoration efforts, conducted under the auspices of the Lower Colorado River Multi-Species Conservation program, may create more habitat for these species than was originally assumed.

Introduction

The two restoration sites surveyed for small mammal presence include the Nature Trail site at the Cibola National Wildlife Refuge (CIBO) near Blythe, CA and the Pratt Agricultural Site (PRAT) near Yuma, AZ. This study was designed as a preliminary effort to determine what species of small mammal were utilizing the different habitat types at these sites.

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a multi-stakeholder Federal and non-Federal partnership responding 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. In order to restore native habitats, the LCR MSCP will create the following cover types: 1) 5,940 acres of cottonwood-willow; 2) 1,320 acres of honey mesquite; 3) 512 acres marsh, and 4) 360 acres of backwaters (U.S. Bureau of Reclamation 2004).

One of the purposes of these efforts is to provide habitat for plant and animal species covered under the Habitat Conservation Plan of the LCR MSCP including, the Yuma hispid cotton rat (*Sigmodon hispidus eremicus*) and the Colorado River cotton rat (*Sigmodon arizonae plenus*). Historically these two species have been documented to occur mainly in dense marsh habitat (Hall 1946, Bradley 1966, Zimmerman 1970). The LCR MSCP calls for the creation of Marsh habitat in order to provide for the habitat needs of these two species. More recently these two species of *Sigmodon* have been encountered in dense, grassy habitats similar to that found at the CIBO site (Andersen 1994, Andersen and Douglas 1999, Blood 1998). Other sources have speculated that these two species of *Sigmodon* may be expanding their range into agricultural areas and may occur in areas not previously considered as suitable (Blood 1998, Hoffmeister 1986).

Study Sites

Cibola National Wildlife Refuge is located along the LCR in Cibola, Arizona and was established in 1964 to offset wildlife and habitat losses due to channelization of the Colorado River (U.S. Fish and Wildlife Service 2003). The Nature Trail restoration plot was established in 1999 and contains 3 distinct areas separated into a 5.5 hectare (ha) mixture of honey mesquite (*Prosopis glandulosa*) and screwbean mesquite (*P. pubescens*), 2.6 ha of Goodding willow (*Salix gooddingii*), and 1 ha of Fremont cottonwood (*Populus fremontii*). A total of 1,500 honey mesquite, 1,500 screwbean mesquite, 10,000 Goodding willow, and 2,600 Fremont cottonwoods were planted (USBR 2003).

The Pratt restoration site (PRAT) is located north of Interstate 8, near Yuma, AZ, on land administered by the Bureau of Land Management. The site is located north of Laguna Dam, south of Mittry Lake, and is surrounded by farm fields and *Tamarix sp.* A leaseholder has farmed the 4.9 ha site since 1949. In the fall of 2003, *Tamarix sp.* was removed from the site immediately adjacent and to the east of PRAT and will be restored with native vegetation. In 1999, Reclamation established six planting regimes with Fremont cottonwoods, Goodding willows, and coyote willows (*Salix exigua*) using potted plants, seeds and poles. Potted plants and poles were planted densely, from 1 to 3 m apart. Seeded areas were planted with cottonwood and willow seeds collected locally and broadcast by hand over wet soils. *Baccharus sp.* independently established in a potted cottonwood plot and *Tamarix sp.* established, in small numbers, in the seeded areas. The potted coyote willow has recruited new individuals independently while the cottonwoods and Goodding willows have not (U. S. Bureau of Reclamation 2003).

Methods

An ocular examination was made of the habitat types at each site and traps were first placed in areas with the highest density of vegetation at ground level. High vegetation density at ground level has been shown to be positively correlated with higher capture numbers of *Sigmodon* along the LCR (Andersen and Douglas 1999). Once the densest habitats had been sampled, other less densely vegetated habitats were sampled.

One habitat type was sampled per night. One or two transects, consistently of twenty traps each, were laid out in a straight line each night of trapping. Traps were set out just before nightfall and then checked at first light the next morning. Traps 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 over night. Small, metal Sherman live traps measuring 13cm x 9cm x 8cm were used which are triggered by the animal stepping on a pressure plate that then closes a trap door behind the animal.

Traps were checked at dawn and any captured animals were transferred into a clear plastic bag and identified to species. Animals were identified using both a key to local small mammal species and the Keys and Wilson Field Guide (2002). Animals were weighed, measured for body length, and measured for any other morphological characteristics needed for identification of the animal to species. All information was recorded onto a standardized data sheet.

Results

A total of 180 traps were placed at the PRAT site, over seven nights. A total of 120 traps were placed over three nights at the CIBO site. At the PRAT site, 28 small mammals of three species were captured for a total capture percentage of 15.56%. At the CIBO site, 12 small mammals of two species were captured for a total capture percentage of 10%. Table 1 and Table 2 demonstrate the overall capture rates for each species per habitat type.

Table 1. A summary of capture efforts at the PRAT site.

Section	Species	Captures	# of Traps	Capture %
Seeded 1	Deer Mouse	19	100	19.00%
Seeded 1	Brush Mouse	6	100	6.00%
Seeded 1	Yuma Hispid Cotton Rat	3	100	3.00%
coyote willow	None	0	40	0.00%
seeded 2	None	0	40	0.00%

Table 2. A summary of capture efforts at the CIBO site.

Section	Species	Captures	# of Traps	Capture %
Mesquite 2	AZ Cotton Rat	3	80	3.75%
Mesquite 2	Deer Mouse	5	80	6.25%
Mesquite 3	AZ Cotton Rat	4	20	20.00%
Cottonwood 1	None	0	0	0.00%

Discussion

This study was a preliminary presence/absence survey and very little statistical analysis of the data is possible. The main point of interest from the results is the presence of *Sigmodon spp.* at each site. While there is no doubt about the identification of these animals as belonging to the genus *Sigmodon*, the identification of these animals to species was based purely upon geographic location of capture. Blood (1998) has suggested that both species may be extending their range over the last twenty years. Identification to species, while not completely certain, is likely correct due to the distance the animals were captured from the edges of the presumed range of each species. These preliminary efforts are now being used to help focus further monitoring and research of small mammals as part of the overall MSCP plan. Beginning in 2006, Reclamation biologists will begin to initiate a project to determine distributional range, habitat types used, and density within utilized habitat types on and off restoration sites. These initial data have demonstrated that these *Sigmodon* species may be much more prevalent in restoration sites along the LCR than was previously assumed. They also seem to be present in dense habitat types such as *Baccharus spp.* and Johnson grass (*Sorghum halapense*). This is consistent with data on the general characteristics of both species throughout their entire range, along with other data collected along the LCR (Andersen and Douglas 1999). Mesquite and cottonwood/willow habitats created by the LCR MSCP may provide unexpected benefits for the two covered *Sigmodon* species. Further studies of *Sigmodon* are needed to establish distribution and densities within habitat restoration sites along the LCR.

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