ACTIONABLE SCIENCE

Camera-Based Monitoring of the New Mexico Meadow Jumping Mouse at Bosque del Apache National Wildlife Refuge

New Mexico Meadow Jumping Mouse Habitat

Bosque del Apache National Wildlife Refuge is about 5 km south of San Antonio, New Mexico. The refuge contains the largest tract of public land within the active floodplain of the Rio Grande and hosts the only known population of the endangered New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) within the Middle Rio Grande Valley in New Mexico. Beginning with a pilot year in 2016, jumping mice at the Refuge have been monitored during late May to late October using remote cameras to assess mouse abundance and habitat relationships.

Project Location
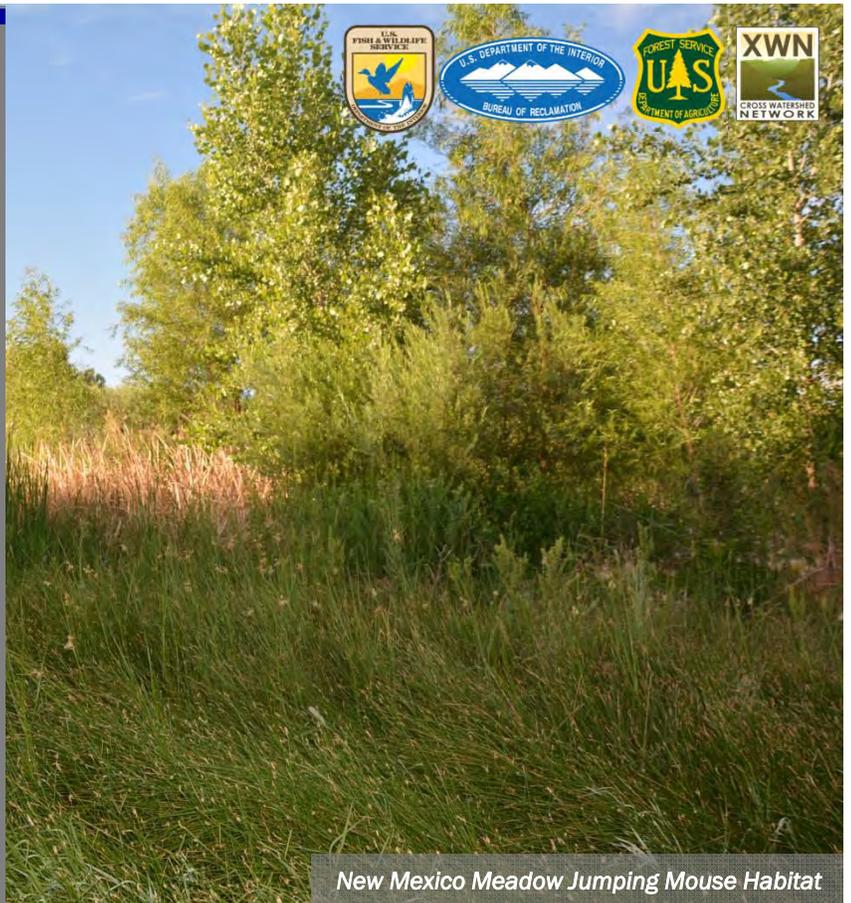
KEY ISSUES ADDRESSED

River channelization and reduced flows have limited large-scale flooding events that maintained the riparian ecosystem in the Middle Rio Grande historically. Flooding helped create the specific vegetation conditions along the river that the jumping mouse requires. During the brief 3-4 month period they are not hibernating, jumping mice are believed to be limited by the availability of foraging habitat consisting of herbaceous wetland vegetation that is tall and dense. To better understand habitat preferences and spatial extent of jumping mice at the refuge, cameras were used as a less invasive method of tracking the population instead of the standard method of live trapping.

PROJECT GOALS

- Develop a standardized survey and monitoring method for jumping mice that is less invasive than live trapping
- Determine habitat conditions associated with more frequent jumping mouse detections
- Map spatial distribution of jumping mice habitat

MONITORING RESTORATION

Refuge staff are planning restoration activities to expand jumping mouse habitat at the Refuge. Restored habitat will be monitored for colonization using camera trapping techniques informed by this study.

A Jumping Mouse Visits a Camera Trap

PROJECT HIGHLIGHTS

Camera Traps: Cameras were used to monitor jumping mice from May to October in 2016 and 2017. Jumping mice hibernate outside of these months. Bait tubes were initially used, but later removed due to competition and predation by other mammals.

Site Selection: During the 2016 pilot year, sites were placed in best available habitat as assessed by refuge biologists. In 2017, sites were selected using stratified random sampling based on habitat quality. Habitat was assessed using a combination of Species Distribution Modeling, consultation with Refuge biologists, and site visits.

Habitat Attribute Sampling: Habitat measurements were taken during both camera set up and take down. Soil moisture, and herbaceous vegetation height and cover were recorded along with percent cover by plant species.

Habitat-Relationship Analysis: Relationships between photo capture rates (jumping mice detections per 100 camera nights) and habitat data collected at each camera location were evaluated, with proportion of days with a jumping mouse detected as the response variable.

Collaborators and Funding Partners

- US Fish and Wildlife Service, Bosque del Apache National Wildlife Refuge
- New Mexico State University
- US Forest Service

Case study support provided by the US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service, and Cross Watershed Network. Updated August 2018. Photos courtesy of US Fish and Wildlife Service

LESSONS LEARNED

Cameras were an effective, minimally-invasive way of detecting jumping mice relative to the conventional method of Sherman live traps. Sherman trapping rates in 2016 were only 0.08 jumping mice per 100 trap nights vs. 2.23 jumping mice per 100 camera nights.

The current extent of estimated habitat at the Refuge is well below the size recommended by the Species Status Assessment for the jumping mouse to ensure the continuation of the species at a location. This restricted habitat indicates that this population is vulnerable to extirpation.

Vegetation height was the best habitat predictor of jumping mice detections--photo capture rates (jumping mice detections per 100 camera nights) increased with vegetation height until a peak at about 2 meters.

Recommendations for future monitoring include reducing camera monitoring to periods of high detectability (late July through early October), and placing cameras in areas with high vegetation cover to maximize detection.

NEXT STEPS

- Continue monitoring habitat conditions and jumping mouse distribution
- Continue restoration activities to expand/enhance jumping mouse habitat

Camera Trap Setup