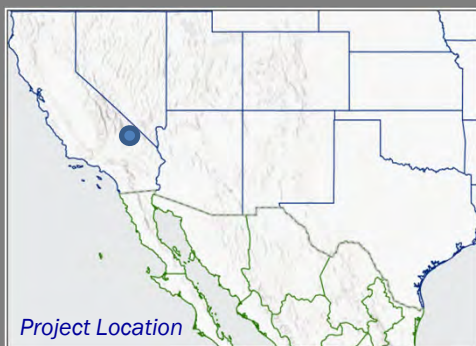


## ACTIONABLE SCIENCE

# Research and Collaboration to Improve Amargosa Vole Conservation in the Lower Amargosa River



The Amargosa River is one of four river systems in the Mojave Desert and runs from Nevada into the southern Death Valley region of California. The lower watershed supports many endemic and endangered species, including the Amargosa vole. This subspecies of the California vole is one of the rarest mammals in North America and was thought to be extinct until the late 1970s. It is entirely dependent on stands of wetland vegetation dominated by three-square bulrush, of which only an estimated 50-60 acres remain in the lower Amargosa River.



Project Location



The Lower Amargosa River Wetlands during the Growing Season

## KEY ISSUES ADDRESSED

Groundwater pumping and land use conversion have resulted in significant wetland loss, and further degradation due to climate shifts and continued or expanded water use by humans will impact many species that depend on the ponds and vegetation of the Amargosa Valley. Scientific understanding of the Amargosa vole is essential for making challenging, potentially controversial management decisions for conservation of this species. This effort is intended to allow tracking of vole populations and prioritization of habitat conservation and restoration. These actions will help evaluate attempts to expand the vole's distribution and population size while considering future environmental conditions.

## PROJECT GOALS

- Collect basic information on Amargosa vole biology to support conservation and reintroduction efforts
- Combine monitoring and modeling to develop habitat and population projections for the future
- Foster relationships with local communities based on open communication about the shared benefits of conserving wetland and riparian areas

## HABITAT SPECIALISTS

Understanding that Amargosa voles are entirely dependent on bulrush within a restricted range allows managers to directly address conservation needs and prevent extinction.



An Amargosa Vole

## PROJECT HIGHLIGHTS

**Population and Habitat Forecasting:** Many studies were combined to create models of vole populations and habitat conditions: trials to determine diet needs and social interactions, mark-recapture trapping, and vegetation assessments. Results were used to model spatial and temporal vole population dynamics, conduct population viability analyses, and forecast the extent and condition of bulrush stands 25 to 50 years in the future.

**Captive Breeding and Translocation:** A captive breeding program was started at UC Davis in 2012 to: (1) learn about basic vole biology, and (2) support possible reintroduction into unoccupied suitable habitat or restored sites. Voles from the captive breeding facility were placed in suitable but unoccupied patches of bulrush along the Amargosa River. Biologists continue to determine the degree of translocation success.

**Public Engagement:** Annual town meetings are held among government agencies, local conservation groups, and Tecopa Hot Springs residents to keep the public informed of project activities and to address questions or concerns.

## Collaborators Funding Partners

- See online for full list of collaborators

## Funding Partners

- U.S. Fish & Wildlife Service
- Bureau of Land Management
- California Department of Fish & Wildlife
- Amargosa Conservancy
- University of California, Davis
- University of California, Berkeley

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Photos courtesy of Rob Klingler/U.S. Geological Survey

## LESSONS LEARNED

Management activities have focused on short-term needs, but sustaining the species and other habitat along the Amargosa River will require long-term conservation and dedicated resources. Additionally, the Amargosa River naturally varies over time. Setting objectives and measures of success is difficult when the underlying system is highly dynamic.

Effective collaboration allowed the project to evolve from being focused on voles to more holistic wetland management. It was recognized that management activities aimed toward supporting voles may not be beneficial to other wetland species.

The low human population and small economy issues in the region are sometimes viewed as being unimportant but incorporating socio-economic and continued outreach and collaboration is required for long-term sustainability of habitat.

## NEXT STEPS

- Secure agreements with nearby residents to maintain water flow into wetlands to benefit voles and many other species
- Integrate regional hydrologic flow models with data on vegetation dynamics
- Model the relationship between vole carrying capacity and fluctuations in bulrush productivity
- Continue experimental translocations to try to expand vole distribution within the wetlands

## PROJECT RESOURCES

For more information on this project, contact Rob Klingler: [rcklinger@usgs.gov](mailto:rcklinger@usgs.gov)

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox: [WWW.DESERTLCC.ORG/RESOURCE/CCAST](http://WWW.DESERTLCC.ORG/RESOURCE/CCAST)



A Wetlands Restoration Test Site