

Scientists work to save endangered desert mammal

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The first sets of endangered Amargosa voles, including the one pictured here, were bred in captivity in Fall 2014 at the UC Davis School of Veterinary Medicine. Credit: Don Preisler/UC Davis School of Veterinary Medicine

Amargosa voles, small rodents that inhabit rare marshes of the Mojave Desert, have faced dire circumstances in recent years. Loss of habitat, extreme drought and climate change brought this subspecies of the California vole to near extinction, leaving only a few hundred clinging to existence. It is now one of the most critically endangered mammals in

North America. But the vole's luck may be changing with the birth of the first pups from a new captive breeding program at the UC Davis School of Veterinary Medicine.

An interdisciplinary research team is working to study the vole and ultimately shore up the population. As part of that effort, the team began a captive breeding program. Ten females and 10 males, all about five weeks of age, were removed from the wild in mid-July and brought to UC Davis.

The research team includes members from UC Davis, the California Department of Fish and Wildlife, the Bureau of Land Management, the U.S. Fish and Wildlife Service, the U.S. Geological Survey and UC Berkeley.

In the field, researchers have observed fluctuations in the size of the Amargosa vole population.

"The numbers are at their highest just after breeding in the spring when the vegetation is still good," said project lead Janet Foley, a professor of medicine and epidemiology at the UC Davis School of Veterinary Medicine. "But as the summer wears on and the limited marsh habitat dries up, the population may crash. This year, we saw their main marsh shrinking fast and we knew a large number would die in the coming months. If we wanted to save the species, we had to act quickly."

During the first few weeks in captivity at Davis, the [voles](#) remained quarantined in individual enclosures. They underwent full diagnostic testing for pathogens and genetic analysis to ensure the most diverse breeding pool possible before placed in breeding pairs.



Risa Pesapane, a Ph.D. student in professor Janet Foley's lab, keeps a close eye on endangered Amargosa voles that are involved in a captive breeding program at the UC Davis School of Veterinary Medicine. Credit: Don Preisler/UC Davis School of Veterinary Medicine

By October, three breeding pairs produced four healthy pups. The other voles are currently being paired for breeding. Eventually, the animals will be placed outside in large escape-proof tubs in a secure location. The tubs will be planted with bulrush to mimic their native habitat.

Researchers aren't sure how long it will take the captive population to build. They also hope to learn about optimal breeding conditions—such as food, shelter, day length and temperature—for the voles. Once a few hundred voles have been born in captivity, researchers plan to reintroduce them to their home range.

"We know the population is already inbred, but we don't know whether

that has affected them as a species," Foley said. "There's so much we have yet to learn about this subspecies. This is a great opportunity to understand population genetics, basic ecology and behavior. Previously, we've made assumptions about those things, but now we can verify them."

Taking a toll on the vole

The Amargosa vole (*Microtus californicus scirpensis*) inhabits sparsely located wetlands just east of Death Valley National Park. Those marsh habitats, which exist only in a few small, isolated patches throughout the desert, are increasingly threatened by drought, climate change and habitat modification by humans. The current drought has likely exacerbated their dire situation. Low water means fewer bulrushes, on which the voles depend for habitat and food.

Once thought to be extinct, the Amargosa vole was rediscovered in the late 1970s by a state fish and wildlife biologist. It was listed as an endangered species in 1980 by the state and in 1984 by the federal government. Recent BLM research indicates an 82 percent chance that the species could go extinct within five years if immediate management action is not taken.

In the past few years, the research team has worked to update information about the number of voles and where they live. Researchers have looked at additional factors impacting the Amargosa vole, including infectious diseases, competition with other rodents, predation, and other environmental pressures.

"The commitment and collaboration demonstrated by the inter-agency/academia vole working group is a great example of what can be accomplished in a short time to conserve not only the Amargosa vole, but also its unique desert marsh habitat that other species also depend

on," said program co-lead Deana Clifford, CDFW wildlife veterinarian and assistant clinical professor at UC Davis. "By pooling our resources and working together we can increase the chances that healthy populations of Amargosa voles will persist well into the future."

Provided by UC Davis

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