

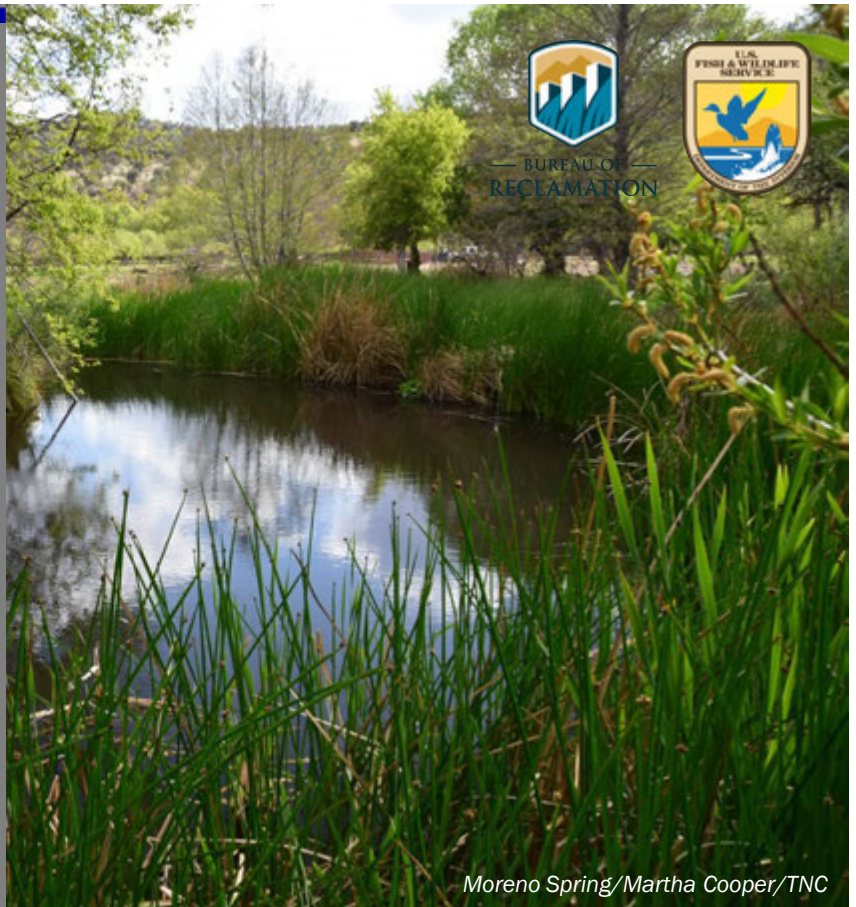
## RESTORATION

# Mimbres River Habitat Restoration for the Chihuahua Chub and Chiricahua Leopard Frog

The Nature  
Conservancy



The Mimbres River Basin is home to two federally threatened species: the Chihuahua Chub (*Gila nigrescens*) and the Chiricahua leopard frog (*Lithobates chiricahuensis*). They suffer from habitat degradation, competition and predation by non-native species, and fungal diseases. The Nature Conservancy owns a part of Moreno Spring, a former river channel of the Mimbres, and began collaborating with the U.S. Fish and Wildlife Service, the New Mexico Department of Game and Fish, and other partners in 2012 to enhance populations of the chub and leopard frogs. The project aimed to restore wetlands by creating open-water habitats and removing vegetation that reduces habitat suitability for chub and frogs. Partners completed restoration in 2015, and monitoring continues.



## KEY ISSUES ADDRESSED

Habitat loss is the biggest threat Chihuahua Chub and Chiricahua leopard frog face. Both species prefer open-water pools and slow-moving water. However, most of Moreno Spring has become overgrown with woody vegetation, particularly alligator juniper (*Juniperus deppeana*), decreasing the open-water area. Private land ownership can challenge managers' ability to restore habitat because of limited access.

Organizations like The Nature Conservancy that purchase land for conservation efforts can provide access to these crucial habitat ranges. Partners need resources and funding to conduct species population surveys and land maintenance for many years after the project's conclusion. Researchers must monitor sites long-term, looking at target species' success and for the presence of invasive or harmful species.

## PROJECT GOALS

- Build habitats that benefit Chihuahua Chub and Chiricahua leopard frog by digging open-water pools and channels and removing vegetation
- Conduct long-term monitoring of species' populations
- Educate interested parties about the need for, and methods of, habitat restoration for these species

## KEEPING CRITTERS SAFE

Before using heavy machinery, biologists combed Moreno Springs day and night to find, and temporarily relocate, frogs and fish. They were then safely returned after restoration was concluded.



*A Researcher Holds a Chihuahua Chub/NMDGF*

## PROJECT HIGHLIGHTS

**Beneficial Habitats:** Project partners dug 14 open-water pools (sizes range from 24-50 ft wide) across the Moreno Springs property. The pools had inlets and uneven edges to appeal to both the chub and the leopard frog. Some pools were isolated, while others were connected to water channels for easy movement.

**Removing Harmful Vegetation:** Biologists removed all juniper trees in fields surrounding the newly-established ponds. Completely uprooting the trees with a trackhoe prevents the likelihood of future clumps sprouting.

**Increasing Frog and Fish Numbers:** By August 2016, researchers saw numerous Chiricahua leopard frog egg masses and over 100 adult frogs in the newly-established pools. Although it is unclear whether these pools directly benefited the Chihuahua Chub, their population has increased in the Mimbres since 2020.

**Restoration Workshop:** The Nature Conservancy led a restoration workshop that had 16 participants consisting of local conservation practitioners and landowners. Participants learned low-cost techniques to restore wetland habitats. The workshop raised awareness for Chihuahua Chub and Chiricahua leopard frog and inspired future restoration work.

## Collaborators

- The Nature Conservancy
- New Mexico Department of Game and Fish
- U.S. Fish and Wildlife Service
- See online for full list of collaborators

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## LESSONS LEARNED

Open communication among project partners allowed them to pool resources including land, permit familiarity, and funding. The project was primarily intended to benefit Chihuahua Chub; however, partners realized the potential to expand restoration to benefit the Chiricahua leopard frog. Collaboration with multiple parties of different expertise allowed the project to benefit additional species.

One unexpected consequence of the project was the discovery of non-native northern crayfish (*Faxonius virilis*) in the constructed pools a few years after restoration completion. The crayfish likely invaded via increased connectivity to the warmer pools that they prefer. Crayfish threaten Chiricahua leopard frogs, as they can prey upon frog eggs and larvae. This unforeseen consequence emphasizes the importance of long-term monitoring after project completion.

Consultation with specialists is a key step in successful restoration work. Project partners enlisted help from an expert biologist in the region who led the pool design and construction. Later reflection by project leaders revealed that the work may have also benefited from specialists on non-native species in the area, potentially preventing the crayfish invasion.

## NEXT STEPS

- Plan a site visit to assess the viability of moving Chiricahua leopard frogs to other secure locations to ensure their safety from crayfish predation
- Collaborate with additional partners for crayfish removal
- Continue monitoring population densities of the Chihuahua Chub in the Mimbres River Basin

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*Chiricahua Leopard Frog/Martha Cooper/TNC*