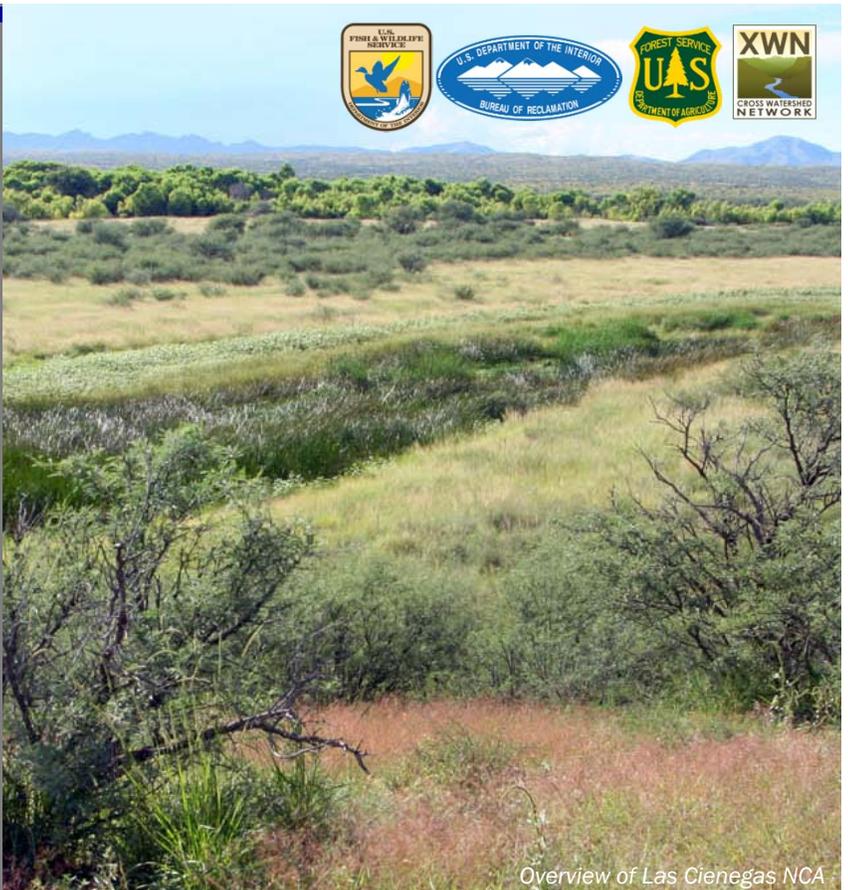


RESTORATION

Restoring Leopard Frog Habitat in Cienega Creek, Arizona

frog conservation
project
frog & fish restoration
outreach group

The Frog and Fish Restoration Outreach Group (FROG) seeks to restore habitats and reintroduce threatened and endangered aquatic species in the Cienega Creek watershed of southeastern Arizona. Cienega Creek is fed by mountain ranges that drain into expansive semidesert grasslands and the riparian corridor. The watershed harbors the most ecologically intact cienega complex (valley wetland spring system) in the southwestern United States. This area includes lands managed by the Bureau of Land Management, US Forest Service, Pima County, the Department of Defense, Arizona State Trust Lands, and numerous private landowners.



KEY ISSUES ADDRESSED

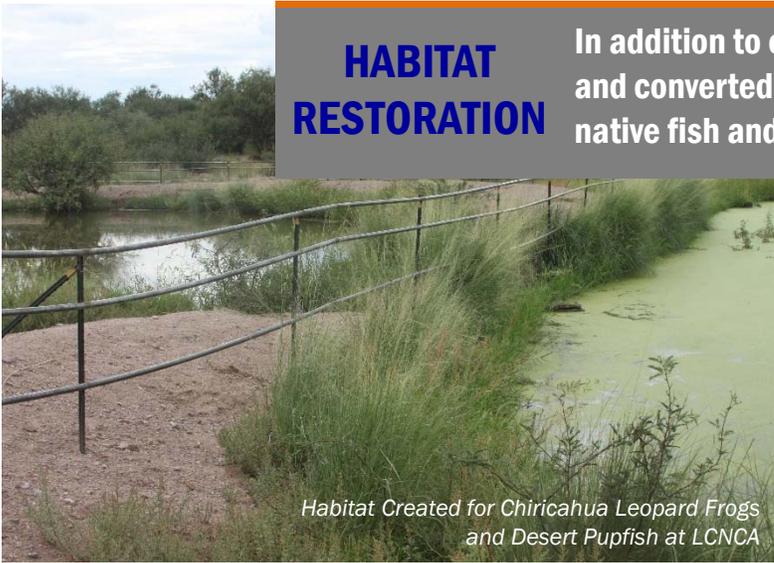
In arid regions around the world, wetlands and the aquatic vertebrates they support are among the most globally threatened ecological assemblages due to water extraction, drought, habitat modification, and invasive species. The American bullfrog is an invasive species that was introduced to the Cienega Creek watershed in about 1986. It is strongly associated with local extinctions of the federally listed, threatened Chiricahua leopard frog due primarily to predation and disease transmission—bullfrogs carry but are not strongly affected by chytridiomycosis, a fungal pathogen causing global amphibian declines. Additionally, northern crayfish and several non-native fishes exist in areas adjacent to Cienega Creek. Potential invasion by these species could impede conservation and reintroduction of Chiricahua leopard frogs.

PROJECT GOALS

- Quantify the status of native and invasive frogs and other aquatic wildlife in large study landscape
- Eradicate populations of invasive aquatic species
- Enhance habitats and establish new populations of the Chiricahua leopard frog to increase distribution, abundance, and metapopulation function
- Engage the public in aquatic conservation issues through outreach and education

HABITAT RESTORATION

In addition to creating habitat for aquatic species, the enhanced and converted livestock waters now provide permanent water for native fish and wildlife.



Habitat Created for Chiricahua Leopard Frogs and Desert Pupfish at LCNCA

PROJECT HIGHLIGHTS

Landscape Scale: the project operated on a watershed level across jurisdictions—this scale allowed the project to incorporate and observe metapopulation connectivity dynamics of both native and invasive aquatic species.

Successful Eradication: bullfrog populations were successfully eradicated by 2013, followed immediately by leopard frog recovery.

“Buffer-Zones” for Invasive Species Detection and Removal: the project established a buffer-zone consisting of stock tanks in a swath of land that serves as a barrier of invasion from extant bullfrog populations in nearby residential areas.

Leopard Frog Introduction: this effort raised 4,769 Chiricahua leopard frogs that were released at 10 new sites in the project area. Most of these populations are breeding. Site selection was guided by thermal considerations to mitigate and research chytridiomycosis

Mutual Human-Ecological Benefits: researchers collaborated extensively with all major ranchers, and engaged residents of the watershed and beyond in the topic of aquatic conservation through youth programs and outreach events.

Collaborators

Arizona Game and Fish Department, Bureau of Land Management, Cienega Watershed Partnership, U.S. Fish and Wildlife Service, Area ranchers, University of Arizona, Caldwell Design, Coronado National Forest, Pima County (Sonoran Desert Conservation Program), The Arizona Nature Conservancy

Funding Partners

National Fish and Wildlife Foundation- Keystone Initiative, Bureau of Land Management

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Photos courtesy of Dennis Caldwell/Caldwell Design

LESSONS LEARNED

Bullfrog eradication required intensive early-season removals to prevent breeding and seasonal timely removal of juveniles approaching maturation. Fine-mesh hoop traps were effective in capturing tadpoles, while shooting with 22-caliber rifles was most effective in collecting adult frogs in complex pools.

Thermal habitat characteristics are important in selecting introduction sites for leopard frogs. The chytrid pathogen is most deadly upon rapid temperature decline. Therefore, natural springs are critical because they have the most stable thermal regimes of any regional waters.

Collaboration can engage regional ranchers in aquatic conservation to develop solutions that provide habitat for wildlife and watering opportunities for livestock.

NEXT STEPS

- Monitor success of natural and reintroduced leopard frog populations
- Evaluate and research chytridiomycosis effects and mitigation success
- Monitor for new arrivals of invasive aquatic species, with additional removals as necessary
- Complete outstanding habitat enhancement construction and establishment of native fishes in additional locations that have been made ready for them

PROJECT RESOURCES

For more information on this project, contact Phil Rosen: pcrosen@email.arizona.edu

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



Breeding Chiricahua Leopard Frogs