The Year of the Frog

The Association of Zoos & Aquariums in North America, the world's other professional zoo and aquarium associations, other conservation organizations, and government agencies have joined in a global effort to save imperiled amphibians. To raise global awareness of the plight of frogs, other amphibians, and activities to conserve vulnerable species, these partners have named 2008 as "The Year of the Frog."
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The Global Amphibian Crisis

A crisis of enormous proportions faces the world's amphibian species. At present, we estimate that about one-third of the more than 6,000 known amphibian species are at risk of extinction. This likely underestimates the real number since data are lacking on many species from Africa, Southeast Asia, and other regions. Several causes underlie this massive decline, but a crucial element is the very nature of amphibians; their skin must always be moist and it literally breathes, so they are especially vulnerable to environmental contaminants. Habitat destruction, disease, pollution, climate change, and other expanding human-related impacts have an entire class of the animal kingdom in serious decline.

Frogs hold great cultural significance. They figured prominently in ancient Egyptian and Greek mythology, as well as more recent folklore. Today’s well-known character Kermit the Frog, whose motto is “It isn’t easy being green,” may have had an early premonition of the crisis frogs face today. Frogs were traditionally used for studying anatomy, physiology, neurobiology, and pharmacology, and were used globally in the 20th century for pregnancy tests. Today, as we see amphibian species in serious decline, frogs are like the “canary in the coal mine” – a class of animals more sensitive than most, potentially signaling an impending environmental calamity.

The severe decline of amphibians occurring today can be compared with the mass extinction of dinosaurs 65 million years ago. Yet, while most people know of the sudden disappearance of dinosaurs, few remember that when the dinosaurs disappeared, almost 70 percent of the other species on Earth disappeared with them. There could be truth in the notion of amphibians as an early indicator...
Chiricahua Leopard Frog Inches Towards Recovery

Recovery – it is the most important part of endangered species conservation. For most species, considerable funding and staff resources are needed to overcome years of population declines and habitat degradation. Despite the limited resources available, and with a lot of help from our friends and partners, such as state wildlife agencies, federal land managers, ranchers and other private landowners, Turner Enterprises, Phelps Dodge Corporation, the Phoenix Zoo, Arizona-Sonora Desert Museum, the Fort Worth Zoo, Nature Conservancy, Sky Island Alliance, and universities, we have put together a recovery program for the threatened Chiricahua leopard frog (Lithobates chiricahuensis). To augment the scarce funds available for recovery activities, we have engaged the Fish and Wildlife Service’s Partners for Fish and Wildlife Program (see the story on page 36) and applied for grants from foundations. We and our very dedicated host of partners are slowly making progress towards the recovery of this species.

The Chiricahua leopard frog is a large, often green, spotted frog that historically was common in the mountains and high valleys of central and southeastern Arizona, west-central and southwestern New Mexico, and southward in the Sierra Madre Occidental and associated sky islands of northeastern Sonora and western Chihuahua, Mexico. We know of 469 historical localities. Declines were first noted in the early to mid-1970s, and today the species is only known to exist at about 41 localities in Arizona and 30 to 35 localities in New Mexico. Its status in Mexico is poorly known, but Chiricahua leopard frogs have declined to some extent there as well. The Mexican government lists it as amenazado (threatened).

The causes of the decline are not always clear, and several interacting factors are often at play, but experts on the Chiricahua leopard frog generally agree that predation by introduced species (especially American bullfrogs, sport fishes, and crayfish) and an apparently introduced fungal skin disease (chytridiosis) that is killing frogs and toads around the globe are the leading causes.
Other problems, such as loss and degradation of wetlands, recent catastrophic wildfires, drought, and contaminants, have contributed to the decline.

The Chiricahua Leopard Frog Recovery Plan was completed in early 2007. It was developed in an open process with a technical team that provided top-notch scientific expertise, while three stakeholder groups kept the process grounded in the social, economic, and nuts-and-bolts realities of achieving recovery on the ground. Key elements include protecting the remaining populations and habitats, establishing new populations, monitoring progress, research, public outreach, and adaptive management.

The primary threats—introduced predators and chytridiomycosis—are not easily addressed. We can control predators at small sites, but eliminating them from large, complex systems is often impossible with current technology. Except for taking precautions not to spread the disease ourselves, we are only beginning to understand how we might deal with chytridiomycosis. Some frog populations are persisting with the disease, especially at warmer and lower sites, and they could provide key insights into how to manage the disease. We are looking into several questions: are the frogs developing resistance to the disease, are there environmental factors allowing their persistence, or both? We
have experimented with eliminating the disease from habitats but are a long way from solving that problem. Our strategy for now has been to try to maintain the remaining populations and begin reestablishing populations and improving habitats in places where introduced predators and disease are absent or manageable. These reintroductions typically involve collecting egg masses from the wild, hatching the eggs and head-starting tadpoles at the Phoenix Zoo or other facilities, and releasing late-stage tadpoles or metamorph frogs. Limited wild-to-wild movements of egg masses and frogs, as well as captive propagation, have also been employed. We have honed our techniques and protocols over the past 12 years (see Tara Sprinkle's following article), and most reestablishments now successfully result in breeding populations.

These recovery actions have been facilitated by 1) a special rule under section 4(d) of the Endangered Species Act that allows incidental take of frogs resulting from operation and maintenance of livestock waters on non-federal lands, 2) Safe Harbor Agreements with the Arizona Game and Fish Department and the Malpai Borderlands Group (a progressive group of conservation ranchers), and 3) programmatic grazing consultations with involved federal agencies on public lands. The 4(d) rule and Safe Harbor Agreements help us build trust with ranchers and private landowners, while the programmatic consultations provide a framework within which we can move forward on recovery with the Forest Service, Bureau of Land Management, and livestock grazing permittees. Artificial water sources developed for cattle have become important habitats for Chiricahua leopard frogs, so tools that help us work in partnership with ranchers are critical to recovery.

On Ted Turner's Ladder Ranch in New Mexico and at a high school in Douglas, Arizona, captive propagation and head-starting facilities are under construction. Thanks to the Arizona Game and Fish Department, Tonto National Forest, and Phoenix Zoo, aggressive efforts to restore habitats and reestablish populations are rebuilding a metapopulation (a group of spatially separated populations that exchange individuals through immigration and emigration) of Chiricahua leopard frogs near Young, Arizona. Meanwhile, the Phoenix Zoo and the Arizona-Sonora

*Combining outreach and recovery, students and their parents from Sierra Vista, Arizona, assist in a release of frogs that were head started at the Phoenix Zoo.*
Desert Museum near Tucson are cautiously breeding the last remaining frogs from the Coconino National Forest and the Santa Rita Mountains in Arizona for reestablishment at multiple sites. Major habitat restoration programs underway at two sites in southeastern Arizona and one in the bootheel of New Mexico will benefit Chiricahua leopard frogs and other imperiled wetland species. We are also working with Mexican partners to build capacity for amphibian conservation in northwestern Mexico. In August 2003, we will hold a workshop at a private reserve in northern Sonora owned by Naturalia (a Mexican conservation group) to instruct Mexican biologists on survey protocols and techniques for captive husbandry, propagation, and headstarting of amphibians.

Restoring an imperiled species is not an easy process, but with hard work from many partners, we are beginning to see how the Chiricahua leopard frog might one day be secure again. Recovery is still a distant destination, but the journey has begun.

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