

Responding to Amphibian Declines during Year of the Frog

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Frogs are going extinct. So are toads, salamanders, newts, and the intriguingly unusual caecilians. The World Conservation Union's (IUCN) **Global Amphibian Assessment** [www.globalamphibians.org], a comprehensive assessment on the conservation status and distribution of 5,918 amphibian species, has shown that almost one-third (32% or 1,896 species) of amphibians worldwide are threatened with extinction and that 165 amphibian species may have already been lost to extinction (IUCN, 2006). North America is not immune to this decline; in fact, in addition to its threatened species, North America has the dubious claim of being the only region with a species currently listed as Extinct in the Wild. In 1994, the last of the Wyoming toads (*Bufo baxteri*) were collected and intensive captive breeding and reintroduction programs were initiated.

Because of the Global Amphibian Assessment, we are now fully aware of the plight facing amphibians. Worldwide, the largest numbers of threatened amphibians are found in Columbia, Mexico, and Ecuador where 209, 198, and 163 species are threatened with extinction respectively. The intensity of threat is greatest in the Caribbean where more than 80% of amphibians in the Dominican Republic, Cuba, and Jamaica are threatened, along with 92% of all amphibians in Haiti (IUCN, 2006). Documenting these terrible statistics was the first step; now is time to take action.

We need amphibians. Since the days of Aristotle, humans have studied the lives of amphibians and have utilized them for human purposes. Antibiotic and anti-tumor properties, analgesics, anti-inflammatory compounds, natural adhesives, and volatiles have all been isolated from amphibians (Tyler et al. 2007). Approximately 10% of **Nobel prizes in physiology and medicine** have resulted from investigations that used frogs [<http://nobelprize.org>]. Amphibians have been a staple in basic anatomy courses, pregnancy tests of the 1950's and 1960's, the pet trade, and in the human food supply. Amphibians have also been used, with mixed results, as a biological control of insect pests in agriculture. And of course, amphibians have been important cultural symbols throughout time.

While the major culprit of amphibian population declines has historically been habitat loss and degradation, many of the declines and extinctions previously referred to as "enigmatic" are now attributed to the rapidly dispersing infectious fungus called *Batrachochytrium dendrobatidis* ("Bd"). Mass die-offs of amphibians, where more than 50% of species were extirpated within 4-6 months, while the remaining species persisted at approximately 20% of their normal abundance, had been seen in upland regions of Central America (Lips et al, 2006). However, evidence linking these die-offs to the arrival of *Bd* was not documented until recently, when Lips et al (2006) were able to predict the arrival of *Bd* to El Copé, Panama and then documented the presence/absence of the fungus both before and after a mass die-off event occurred. This research shows that the fungus is continuing to spread through Panama in a southeasterly direction and its spread is currently unstoppable. The combined effect of

habitat destruction, climate change, pollution, invasive species, and *Bd* cannot be addressed solely in the wild. Zoo and aquarium habitats and breeding programs have become the only hope for many species faced with imminent extinction. With their demonstrated expertise in endangered species breeding programs, accredited zoos and aquariums have been called upon to meet this conservation challenge.

The global zoological community will highlight 2008 as the Year of the Frog to mark a major conservation effort to address the amphibian extinction crisis. Coordinated internationally by Amphibian Ark, an initiative of the IUCN's Conservation Breeding and Amphibian Specialist Groups and the World Association of Zoos and Aquariums, and implemented by regional zoological associations such as the Association for Zoos and Aquariums (AZA), the Year of the Frog will engage the public in amphibian conservation and raise funds for amphibian conservation efforts into the future. In 2008, AZA facilities will lay the groundwork for expanding existing and initiating new amphibian conservation efforts.

AZA-accredited zoos and aquariums are already an active force in amphibian conservation. Since 2000, AZA members have spent more than \$1.1 million on amphibian conservation and research projects in more than 20 countries around the world. Two amphibian species, the Wyoming toad and the Puerto Rican crested toad, are already part of AZA's Species Survival Plan program. Additional species threatened with extinction will be brought into facilities with expertise in place to care for them. Facilities with less experience will contribute to the effort by expanding their skill-set and developing husbandry manuals for common species. These manuals may yield important clues about caring for less common species at other AZA facilities. When working with endangered species, there is little room for error.

Partnerships are a fundamental component of effective amphibian conservation. AZA's Amphibian Taxon Advisory Group (ATAG) worked with international experts to create an **Amphibian Action Plan** to identify amphibian species in Canada, the US, Mexico, and the Caribbean that are threatened with extinction and that could benefit from the expertise of zoos and aquariums [http://www.aza.org/ConScience/Documents/Amphibian_Action_Plan.pdf]. Programs to protect species outside of the US will be developed in collaboration with local experts, international zoological colleagues and the Amphibian Ark, while programs within the US will complement state and federal priorities. AZA is already reaching out to the US Fish and Wildlife Service and the Partners in Amphibian and Reptile Conservation (PARC) network, while AZA-accredited zoos and aquariums continue approaching their local and regional partners, as well.

Year of the Frog will take the entire AZA community's amphibian conservation efforts to new levels, not only by increasing our conservation efforts, but also by engaging the public to learn about and support the critical work needed to prevent amphibian extinction.

To learn how you can help, please visit [insert name of zoo or aquarium] on Leap Day (February 29, 2008) or any day of the week. Amphibians need our help.

References:

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