



amphibian ark

Keeping threatened amphibian species afloat



Starrett's Glass Frog: Ron Holt

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About Us

Amphibian Ark (AArk) is a global organization formed by the Conservation Breeding Specialist Group (CBSG), World Association of Zoos and Aquariums (WAZA) and the International Union for Conservation of Nature/SSC Amphibian Specialist Group (ASG).

AArk has been tasked with implementing the *ex situ* (captive breeding) aspects of the Amphibian Conservation Action Plan (ACAP). The goal is to have amphibians safe in nature. The mission is to ensure the global survival of amphibians, focusing on those that cannot currently be safeguarded in nature. This is accomplished via short term breeding programs conducted while the threats in nature can be mitigated.

AArk promotes these breeding programs in range countries wherever possible so that animals do not have to undergo the risks associated with



Lemur Leaf Frog: Ron Holt

moving them across international borders. Through prioritization and training workshops, AArk attempts to put the knowledge and skills into the hands of range country conservationists and through a partnership database (www.frogmatchmaker.org).

AArk does not maintain colonies of endangered frogs itself but helps facilitate programs through its members, which include institutions such as Zoo Atlanta and the Atlanta Botanical Garden, Chester Zoo, Durrell Wildlife Conservation Trust, Pontificia Universidad Católica del Ecuador, Zoo Amaru, Taronga Zoo, El Valle Amphibian Conservation Center and the Amphibian Research Centre.

Amphibians are more than cultural icons or something we grew up with as kids. They represent an important component of the global ecosystem, act as indicators of condition of the environment and contribute to human health. They survived on this planet for millions of years, but are now threatened with extinction. Addressing this crisis represents the greatest species conservation challenge in human history.



Reinwardt's Flying Frog: Norhayati Ahmad, UKM

Amphibians in Crisis

The global amphibian crisis worked its way up to front-page news during the Amphibian Ark 2008 Year of the Frog campaign. Locally, the Atlanta Botanical Garden and Zoo Atlanta both participated activities to mark the occasion and raise awareness about the troubles facing our green friends. These Atlanta institutions were among the founders of the Ark and both have been working diligently to help protect amphibians for many years.

Zoos and aquariums around the world have already accomplished some great work in amphibian conservation, including the Zoological Society of London, Zoo Outreach Organization and the Japanese Association of Zoos and Aquariums. But the time for status quo is far behind us: we must change

our view and approach to amphibian conservation now. We are no longer talking about an amphibian population decline phenomenon, we are speaking of an amphibian species extinction crisis. 43% of amphibian species are experiencing decline, 32% are globally threatened, more than 120 species are possibly extinct, at least one family (with a unique reproductive mode) has been lost.

We are on the verge of losing a huge part of an entire vertebrate class, one more species than the mammals that are currently consuming the lion's share of our resources. This epiphany comes with a charge - any organization that considers conservation a core goal must take immediate measures for significant action!



Taylor's Glass Frog: Cesar Luis Barrio Amoros

43% of amphibian species are experiencing decline



Asian Common Toad: Richard Gibson

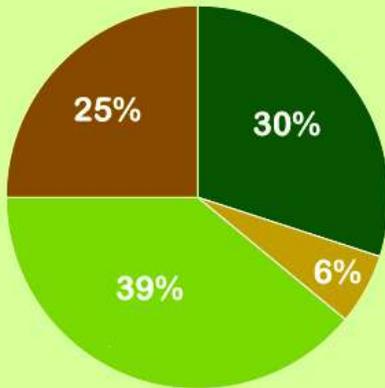


Our response now must be in proportion to the crisis, lest we relegate ourselves to mere entertainment venues with no facade of conservation, as our critics have long accused. Not only are we uniquely qualified for the task, the rest of the conservation and scientific community is expecting us to respond.

“The summation of the 1999 space survey is that there is only enough space existing in AZA [Association of Zoos and Aquariums] institutions to accommodate 10 taxa of amphibians at the management level of PMP [Population Management Plan] or SSP [Species Survival Plan]. In these same institutions there is enough space allocated for mammals to accommodate at least 57 SSPs and the majority of these mammals have a body mass of more than 10 kg and significant space requirements. If each

AZA institution allocated an additional 400 square foot building to amphibian management and provided keeper support for the facility, the number of taxa that could be managed at a PMP or SSP level would easily exceed 100 taxa. If AZA is to “Keep all the Pieces”, the theme of its 1996 annual conferences, then a wave of dedicated amphibian facilities must be built. Amphibians need dedicated space and should not be simply incorporated into Reptile Houses or included as a small part of biome or zoogeographically-themed facilities. If this dedicated space is lacking, zoos will never play a major role in maintaining amphibian biodiversity.” - Dr. Kevin Wright, ATAG 2000 Regional Collection Plan.

Threat Level of Amphibian Species



- Threatened
- Near Threatened
- Not Threatened
- Data Deficient

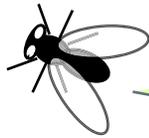
- 30% (1,895): of 6,285 amphibian species assessed by the IUCN, are threatened with extinction. 6% (382) known to be Near Threatened and 25% (1,597) are Data Deficient; about 3,900 species are in trouble.



Two-toned Poison Frog: Richard Gibson

- 500: estimated number of amphibian species whose threats currently cannot be mitigated quickly enough to stave off extinction, i.e., those who require *ex situ* intervention.
- 50: that same number extrapolated (extreme best-case scenario) to the global zoo community.
- 1: the number of amphibian species for which each of the 500 largest WAZA zoos must take responsibility as a stopgap to stem the losses.
- 165: number of amphibian species believed to have already gone extinct, including 39 known to be extinct or extinct in the wild but still survives in captivity, and 130 not found in recent years and possibly extinct.
- 10: number (not percentage) of amphibian species that North American zoos are currently prepared to manage long-term.
- 10%: portion of amphibian species threatened with extinction that the global zoo community is at best currently prepared to manage.

Amphibians Matter



We all can relate to amphibians, especially frogs. As kids, how many of us chased frogs in the backyard or collected tadpoles to raise or read about kissed a frog in hopes for that special prince?

Amphibians are an important part of the food web, consuming millions of insects and other invertebrates and also becoming prey for creatures higher in the food chain. Their thin, permeable skin through which they drink and breathe, makes them particularly sensitive to toxins in the environment and for this reason, they are often considered our environmental barometers.

Speaking of skin, amphibian skin has proven to be a valuable pharmaceutical treasure chest. From antibiotics and analgesics to compounds that block the transmission of HIV, the thin skin of amphibians has already produced many exciting bio-medically active products. Unfortunately, many species and their skins have already gone extinct before we have a chance to discover what their contribution could be.

Amphibians profoundly enhance our lives and our world in countless ways. They provide vital biomedicines, including compounds that are being refined for analgesics, antibiotics, stimulants for heart attack victims, and treatments for diverse

diseases including depression, stroke, seizures, Alzheimer's, and cancer. The Australian red-eyed tree-frog (*Litoria chloris*) and relatives give us a compound capable of preventing HIV infection, the cause of AIDS.



Himalaya Flying Frog: Norhayati Ahmad, UKM



San Jose Cochran Frog: Ron Holt

Amphibians have been likened to canaries in the coal mine

Amphibians' thin skins help them drink and breathe, but also make them susceptible to environmental contaminants, particularly agricultural, industrial, and pharmaceutical chemicals. For example, atrazine is the most widely used herbicide in the US with an estimated 61 to 73 million pounds used per year during the 1990s.

Scientific studies have found that atrazine may cause a variety of cancers and act as an endocrine disruptor, mimicking the feminizing hormone estrogen and harming human and animal reproductive and hormone systems. Atrazine is generally applied in spring and can accumulate in amphibian breeding pools. Laboratory studies have shown that atrazine can chemically sterilize tadpoles at levels well below the EPA maximum allowable level for drinking water. Although lawsuits brought against the EPA by the Natural Resources Defense Council date back to 1999, the EPA announced on October 31 2003 that it had negotiated a deal with industry that would not require any new restrictions on atrazine use.

Other organochlorine pollutants (e.g., DDT, PCBs, dioxins) can also act as endocrine disruptors, inducing similar feminizing effects in amphibians. It has been demonstrated that these responses are occurring in nature, but it is yet unclear what long-term effect they will have on wild populations.

Amphibians have been likened to canaries in the coal mine: just as miners used sensitive canaries to warn them of toxic gases in the mines, amphibians might be warning us of unsafe environmental conditions that could eventually seriously impact our health. Could we be similarly affected by these widespread endocrine disruptors, or are we already? Atrazine, for example, has been detected in more than 1 million Americans' drinking water at levels higher than EPA's drinking water standard. Some human studies suggest that the average sperm count of adult men in certain populations is significantly decreased, as much as 50% of what it was two generations ago. Are we also suffering the same feminizing effects of agrochemicals, industrial waste, and other estrogen-mimics that we see affecting amphibians so drastically?



Siberut Island Frog: Norhayati Ahmad, UKM

Amphibians are also vital components of their ecosystems. In the 1970s, it was discovered that the northern redback salamander (*Plethodon cinereus*) was possibly the most abundant vertebrate in eastern US forests, exceeding the biomass of all the bird or mammal species combined. Amphibians feed primarily on insects and other invertebrates. It was estimated that a single population of about 1,000 cricket frogs (*Acris crepitans*) could consume almost five million invertebrates in one year. Clearly they serve as significant predators of small invertebrates, as abundant prey for larger predators, and as a vital link in the food web between the two. In areas of the world where amphibians have declined, there has been an increase in invertebrate pests that damage crops and that carry human diseases.

Amphibians have also played a vital role in human culture. While in some cultures frogs and toads have been despised and regarded as evil, other cultures have embraced them as life-giving keepers of the rains or agents of fertility and good luck. Some simply use them for food. Amphibians have been both cherished and persecuted by different cultures as characters in fantasy stories, ingredients in folk medicine, and as spiritual beings.

How We Help

Amphibian Ark's mission is to ensure the global survival of amphibians, focusing on those that cannot currently be safeguarded in nature. To help achieve our mission, we carry out a number of varied activities:



Red-eyed Tree Frog Eggs: Ron Holt

- Raising awareness about the global amphibian crisis, and we can all play a part in helping to save amphibians, via the internet, newsletters and global campaigns, such as the very successful 2008 Year of the Frog campaign.
- Developing new partnerships, and helping to strengthen existing ones, between amphibian conservation organizations, especially those involved in amphibian *ex situ* conservation programs. Our Frog MatchMaker list provides many opportunities too help support amphibian conservation programs.
- Facilitating conservation needs assessment workshops, where regional amphibian experts help to determine and prioritize the conservation needs for species in their regions, and making the results of these workshops available to the wider amphibian conservation community.
- Developing and running *ex situ* conservation training courses in regions and countries where additional expertise is required. This includes the development of husbandry manuals and guidelines.
- Promoting the successes that our partners are achieving with their *ex situ* amphibian conservation programs.
- Initiating Advisory Committees to assisting our partners with population management, biobanking, husbandry/biosecurity and other technical areas.



- Raising funds to help support much-needed conservation programs, by applying for grants and by promoting contributions from the corporate sector and the general public.
- Providing seed grants to fund small start-up projects that are in need of seed money in order to build successful long-term programs that attract larger funding.
- Facilitating communication amongst the amphibian conservation community by providing a contact list of amphibian expertise throughout the world.

This is the greatest conservation challenge in history



Venezuelan Glass Frog: Cesar Luis Barrio Amoros

Addressing the amphibian extinction crisis represents the greatest species conservation challenge in the history of humanity. One third to one half of all amphibian species are threatened with extinction, with probably more than 120 already gone in recent years. The IUCN Global Amphibian Assessment has alerted us to the fact that hundreds of species face threats that cannot be mitigated in the wild, they require zoos to save them in the short term until adequate conservation measures to secure wild populations can be developed.

The World Association of Zoos and Aquariums (WAZA) has joined with two branches of the IUCN Species Survival Commission - the Conservation Breeding Specialist Group and the Amphibian Specialist Group - to form the Amphibian Ark. Since 2006 the Amphibian Ark has been helping the *ex situ* community to address the captive components of the Amphibian Conservation Action Plan, saving as many species as possible by providing global coordination, technical guidance, training, necessary linkages to other IUCN groups, communications, and guiding publicity and capital campaigns.

A Steering Committee, with Executive Co-Chairs from each of the three principal partners, provide strategic guidance on the activities of the AArk and ensure excellent communication with all stakeholders. Two full-time and four part-time dedicated positions coordinate all aspects of implementation within the AArk initiative; assist AArk partners in

evaluating amphibian conservation needs and regions for *in situ* and *ex situ* conservation work; lead development and implementation of training programs for building capacity of individuals and institutions; and develop communications strategies, messages, and materials to promote understanding and action on behalf of amphibian conservation.

Without immediate captive management as a stop-gap component of an integrated conservation effort, hundreds of species will become extinct. This conservation challenge is one that we, the *ex situ* community, are uniquely capable of addressing. Never before has the conservation community at large charged zoos and aquariums with a task of this magnitude. This is an opportunity for every zoo and aquarium, regardless of size, to make a vital conservation contribution, and for our community to be broadly acknowledged as a credible conservation partner. Supporting this call to action is clearly within the financial capacity

of all zoos and aquariums, and engages the diverse expertise found within all institutions. Our goal is 100% participation of WAZA zoos and aquariums and the regional associations. If we do not respond immediately and on an unprecedented scale, much of an entire vertebrate class will be lost, and we will have failed in our most basic conservation mission as defined in the World Zoo and Aquarium Conservation Strategy.



Spotted Tree Frog being measured: Michael McFadden



How You Can Help

Amphibians are closely tied to their environment, so helping amphibians can be as simple as helping the planet!

- Help out the environment. Amphibians are telling us that we are doing damage to health of the planet. Promoting environmental stewardship will benefit not only our thin-skinned friends but also our own species!
- Make an effort to tread more lightly on the planet by putting a stop to big cars, big families, hot thermostats, and hamburgers.
- Organize a group to clean up a local stream or pond or better yet, join a local branch of Adopt-a-Stream!
- In the south, the use of herbicides is one of the leading causes of the loss of biodiversity. In your own yard, pull weeds instead of spraying!
- Support local organizations that are taking action to help amphibians and their habitats.



Hourglass Treefrog: Ron Holt

- Join us at Amphibian Ark to receive the latest news and how to help! Boarding the Ark does not require that you work at a zoo, hold a PhD or bring in a six-figure income. Anyone can be a part! (www.amphibianark.org)

Look closely at the current palette of captive-bred species available and try to appreciate their inherent beauty and appeal rather than maintaining a never-ending search for the latest import.

We wish that we could invite you to join us by breeding threatened species in your home, but the risk of introducing new diseases into animals destined for release back into the wild is too great.



European Tree Frog: Aleksander Niwelinski

However, that does not mean that you cannot do important things with your collection to help our cause! First, you can get involved in collaborations that promote sustainable breeding and management, like the Amphibian Steward Network set up by the Tree Walkers organization, which “harnesses the passion, skills, and resources of private amphibian enthusiasts” to promote activities leading to sustainable captive population management, reducing collecting pressure on wild populations, and supporting *in situ* conservation action for the species involved.

Second, you can use your skills and motivation to make a difference in advancing our husbandry knowledge. Did you know that the zoo community does not even know how to breed our common backyard toads without using artificial hormone injections? Maybe you can show us how it is done, and then these same techniques could be used with numerous threatened species.

Just because your animals aren’t destined for release does not mean that they pose no risk to the wild. We must all work together to keep our animals and their potential pathogens contained. After all, it is the commercial trade that spread chytrid around the world and got us into this mess in the first place. So, for starters, do not ever release your pets. This also applies to native ones you might have collected locally, as they might have caught exotic parasites from your other pets. Also, be sure to properly disinfect and dispose of used substrates, water, etc. rather than dumping them outside. Try to think of the path between the indoors and the outdoors as a one way street.



Dyeing Poison Arrow Frog: Richard Gibson



Beyond your collections, try to be a good environmental steward. Make a new wetland in your backyard, even a small pond will help. Tree Walkers' Operation Frog Pond provides great advice. If you build it, they will come. If you are surrounded by development and they don't come, rescue eggs and tadpoles from local swimming pools and use them to seed new populations. And try to manage your yard without using pesticides, fertilizers and weed killers, all of which are poisonous to amphibians.

Your support is crucial to saving threatened species. 100% of funds donated to Amphibian Ark will be spent on ensuring a long-term future for threatened amphibians. Many hundreds of community groups and individuals are already helping to support amphibian conservation in many ways, and their contributions are incredibly valued.

Help raise awareness. Start a letter-writing campaign to politicians, from local to federal, to raise their awareness and ask them to encourage and finance conservation activities for amphibians. If you are a student, start a letter-writing campaign in your and other schools

encouraging them to do the same. And speaking of students, go visit them and share your passion. What biology class would not welcome a visit from a herpetologist?

Amphibians have great public appeal! Raise money to support conservation projects where many times even a few hundred dollars can go a long way. Pick a project to support and go for it! There are countless ways that people have raised funds for amphibian conservation. As little as \$50,000 can save a species from extinction, but just a few dollars a day can buy vital supplies and support project assistants in range countries.

**To learn more or
join Amphibian Ark,
visit our website:**

www.amphibianark.org



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