2008 YEAR OF THE FROG

Global InfoPack





TABLE OF CONTENTS

amphibian ark

0

To

•

Foreword	4
Introduction	
ection 1: Why A Campaign?	
The Connection Between Man and Nature	6
Man's Effect on Nature	6
Frogs Matter	6
The Problem	7
The Reason	7
The Solution	8
Getting The Word Out	8
A Further Purpose	9
The Amphibian Ark – 2008 Year of the Frog Campaign	10
Goals	10
Long-Term Partnerships	10
10 Good Reasons to Join the Campaign	11

Frogs Matter. Jump In.

Section 2: Global Communications and Fundraising Plan	
Communications and Fundraising Overview	
Amphibian Ark 2008 Year of the Frog Communications Plan	14
Amphibian Ark Communications Tools	
Global Amphibian Ark Events	
Other Programs and Activities	
Amphibian Ark Fundraising Plan	
Section 3: Suggested Campaign Activities	27
PR & Marketing	
Global Campaign	
Local Efforts	
Education	
Fundraising	





Section 4: Merchandise	33
Section 5: Campaign Guidelines	34
Participation and Registration	34
Registration Form	35
Use of Images	36
Use of Logos	37
Fundraising Money Transfer Details	37
Sharing Information and Materials	39
Awards and Certificates	39
Campaign Contacts	40
Section 6: Amphibian Information	41
Introduction	41
Amphibians in Danger	42
Threats	42
Red List Status	43
Extinctions	44
Status by Taxonomic Group	45
Frightening Statistics!	48
Geographic Patterns	49
Geography of Threatened Species	52
Patterns of Endemism	58
Chytrid Fungus	61
Amphibians Role in Culture and Religion	62
Section 7: How Will My Money Be Used	66

Section 7. How will wry w	ioney be used	
Appendix		

Foreword

amphibian

Almost everyone can recognise frogs and toads. They are those extraordinary vertebrate animals which change from egg to adult by undergoing metamorphosis. This remarkable process played a crucial part in these animals' pioneering invasion of the land. It demonstrates evolution compressed into just a few weeks and it sparks our imagination.

Frogs Matter.

Jump In.

Today amphibians can be found in enormous variety and occupy a wide range of water and land habitats – except for the oceans and the frozen polar regions. They are so familiar to most people that they have become part of the myths, legends, and folk tales of many cultures. And there is still much more for us to learn about them for new species are being discovered even today. Yet their habitats are being destroyed at such a speed that now many species may disappear before we even discover that they exist. Infections of chytrid fungus, for which there is no known cure, are today spreading rapidly and threatening entire amphibian communities. There is thus the real possibility that much of an entire category of animals may become extinct worldwide - unless we prepare to act guickly. Captive breeding has been shown by the scientific community to be one of the most important and appropriate ways to slow down the effects of this crisis. Selected species, bred in favourable *ex-situ* conditions, can multiply and prosper to such an extent that populations can be released into secure environments in the wild. The IUCN/SSC Amphibian and Conservation Breeding Specialist Groups and the World Association of Zoos and Aquariums have therefore launched The Amphibian Ark to support such ex-situ projects around the world. The global zoo and aquarium community has taken on this challenge with enthusiasm and is providing appropriate facilities and breeding grounds within their institutions. But implementation calls for financial and political support from all parts of the world.

I therefore extend a warm invitation to all of you to join the 2008 Year of the Frog global campaign.

Its main goal is to generate public awareness and understanding of the amphibian extinction crisis. The funds raised from this worldwide campaign will help support Amphibian Ark coordination activities and finance regional initiatives such as rescues, training workshops, and cooperatively managed centres. It will also ensure the sustainability of surviving populations by creating a cash fund that will extend far beyond 2008. Without an immediate and sustained conservation effort to support captive management, hundreds of species of these wonderful creatures could become extinct in our own lifetime.

Sir David Attenborough Patron, Amphibian Ark 2008 Year of the Frog



Copyright © BBC

Introduction

Amphibians are declining rapidly; species, genera, and even families are going extinct at an unprecedented rate. One third to one half of all amphibian species are threatened with extinction, with probably more than 120 already gone in recent years. Habitat loss is the major threat in terms of number of species affected, but the rapid dispersal of amphibian chytrid fungus is of major and urgent concern because of its tendency to drive species to extinction quickly. Scientists believe many more species may go extinct before we are able to act. But there is one option currently available which can save hundreds or even thousands of species if we act rapidly: captive survival assurance populations. Zoos, aquaria, and botanical gardens play a crucial role in this solution, as they can provide *ex-situ* breeding grounds for the immediate conservation action needed before hundreds of species disappear.

Frogs Matter. Jump In.

IUCN has called upon zoos and aquaria to help save the amphibians. In 2005, during the Amphibian Conservation Summit in Washington, D.C., the Amphibian Conservation Action Plan (ACAP) was developed and the IUCN/SSC Conservation Breeding Specialist Group (CBSG) was commissioned with the implementation of the *ex-situ* aspects of the ACAP. In 2006, CBSG, the IUCN/SSC Amphibian Specialist Group (ASG) and the World Association of Zoos and Aquariums (WAZA) set up a collaborative program called the Amphibian Ark (AArk) to develop, promote, and guide short-term *ex-situ* management, thus making possible long-term survival of amphibians for which adequate protection in the wild is not currently feasible.

The global zoo and aquarium community has taken on this challenge. But implementation costs money and requires political support from all corners of the world. Faced with this challenge, the Amphibian Ark is launching this global Amphibian Ark campaign – **2008 The Year of the Frog**.

This Global InfoPack will provide information on what is planned on a global level in terms of both communications and fundraising. In addition, we hope it provides all the information you need to participate successfully in the Amphibian Ark Year of the Frog campaign. If you need a more specialized piece of information or advice, please contact your regional association representative or a member of the Amphibian Ark staff. In light of the seriousness of the threat to amphibian survival, we sincerely hope that all WAZA zoos and aquaria will join in what we are confident will be an informative and successful campaign.

Section 1 Why a Campaign?

amphibian



Frogs Matter.

Jump In.

The Connection Between Man and Nature

Humans should have connections to nature. Experiences in nature literally enrich our lives and inform our choices for future generations.

- Nature renews the spirit, refreshes emotional and mental health, and provides places to live, play, recreate, explore, learn, and enjoy.
- Nature's beauty and resources are national and international treasures, defining our character and heritage.
- The variety and diversity of life on Earth is needed and inspirational for human existence.

Man's Effect on Nature

All life on earth exists with interdependent relationships between living things and their environments. A healthy environment sustains life for humans and animals.

- Humans are responsible for dramatic changes to nature at a rate unprecedented in Earth's history, due to population growth, increased consumption of resources, global warming, habitat destruction, invasive species, and overuse of many species.
- People should recognize their responsibility to care for the Earth and leave a healthy environment for our families and future generations. Due to the unprecedented changes occurring on the planet, we must often intervene to save wildlife.

Frogs Matter

Amphibians are a critical part of a healthy natural world. In addition to their intrinsic value as a beautiful part of nature, they offer many benefits to us:

- They play an important role in the food web as both predator and prey, maintaining the delicate balance of nature. Where they are disappearing, detrimental effects are already being documented.
- Amphibians eat pest insects, benefiting successful agriculture around the world and minimizing the spread of diseases, including malaria.



- The skin of amphibians has substances that protect them from some microbes and viruses, offering possible medical cures for a variety of human diseases, including AIDS.
- Biologists refer to amphibians as "the canary in the coal mine:" They are among the first species to be affected by environmental stressors; so when they show declines in the wild, it serves as a warning to other species, including humans.
 - Amphibians' skin is highly permeable, allowing them to drink and breathe. Unfortunately, contaminants also readily enter the body, making amphibians an exceptional indicator of environmental quality. They are particularly sensitive to pollution, making them important sentinels to potential human threats.
- Frogs have had a special place in various human cultures for centuries, cherished as agents of life and good luck.

The Problem

After thriving for over 360 million years, 1/3 to 1/2 of the world's approximately 6,000 known amphibian species could go extinct in our lifetime.

• Earth is facing the single largest mass extinction since the disappearance of dinosaurs.

The Reason

Amphibians are severely affected by habitat loss, climate change, pollution and pesticides, introduced species, and over-collection for food and pets. While habitat destruction is the major threat, the most immediate cause is a parasitic fungus called amphibian chytrid, a disease that is deadly to hundreds of amphibian species and has quickly spread from Africa across the planet over the past 30-40 years. Global climate change may have exacerbated the problem.

- Amphibian chytrid was discovered a decade ago and since then dozens of frog species have gone extinct because of it.
- Since the 1930s, African clawed frogs (likely resistant carriers of the fungus) have been shipped around the world by the thousands for human pregnancy tests and lab studies, spreading the disease worldwide. Recently, the food and pet trade may have contributed to the problem as well.
- Amphibian chytrid is currently unstoppable and untreatable in the wild, even in protected areas. In the environments where it thrives, the fungus can kill 80 percent of the native amphibians within months, leading to widespread amphibian extinctions.
- The amphibian chytrid's spread and effects may be exacerbated by climate change.
 - Warmer temperatures dry the moist areas where amphibians thrive, and cause stress that may lead to greater susceptibility to disease.

The Solution

amphibian

In response to the problem, scientists and conservationists agreed to an Amphibian Conservation Action Plan (ACAP), including research, assessment, and conservation in nature. For those species that cannot be saved in nature, the plan is to rescue them before they are gone, and to protect them in captive facilities until the threats to the wild populations can be controlled. Captive management is a vital component of ACAP's integrated conservation effort, buying valuable time to mitigate threats for species that would otherwise go extinct. The Amphibian Ark is an initiative to fulfill our responsibility for this critical component of the ACAP. The AArk plan is simple but requires at least \$50 million in funding.

Frogs Matter.

Jump In.

- Amphibian Ark is a program coordinated by the World Conservation Union (IUCN)/Species Survival Commission (SSC) Conservation Breeding Specialist Group, IUCN/SSC Amphibian Specialist Group, and the World Association of Zoos and Aquariums (WAZA), and supported by a worldwide network of zoos and aquariums, to help keep threatened amphibian species afloat.
- The AArk program will rescue priority endangered species and place them in "protective custody" in dedicated biosecure facilities at zoos, aquariums, and other institutions around the world for safekeeping and breeding, helping to ensure the long-term survival of amphibians.
- These rescued amphibians will be released back into the wild when the original threats have been controlled.

Getting the Word Out

Organizations that support Amphibian Ark will lead a global public awareness campaign, "2008: The Year of the Frog" to:

- Raise awareness among national governments, world media, school educators, and people generally about the vulnerability of amphibians and the extinction crisis they face.
- Raise funds through corporate sponsorship, philanthropy, public, and government involvement to support AArk's rescue efforts and ensure amphibians' long-term sustainability
 - Funds will be paid to AArk through the Global Conservation Network, a part of the Conservation Breeding Specialist Group. Funds will cover costs such as:
 - Prioritization workshops
 - o Biosecure rescue centers and operating expenses
 - Staffing and training
 - Field surveys and rescues
- Inspire the zoo community and other institutions to participate in AArk by creating and maintaining facilities for the most threatened amphibians.
- Further establish IUCN and the world zoo and aquarium community as leaders in global conservation.



A Further Purpose

The Year of the Frog will serve as an example of how to boldly and confidently face one of our planet's biggest environmental challenges.

- The condition of our planet and its vanishing wildlife is a top concern of both adults and children, who are frustrated and unsure of how to help. This campaign and the AArk program will give them a direct chance to help.
- People will be invited to participate in the AArk initiative by getting engaged as volunteers where needed, spreading the word, making donations, and influencing governments, and they will learn that, working together, we can deal with environmental crises.
- The Amphibian Ark and Year of the Frog will help all to confidently face and address other environmental challenges.

The Amphibian Ark 2008 Year of the Frog Campaign

Goals

amphibian

- To generate public awareness and understanding of the amphibian extinction crisis.
- To raise funds for implementing the ex-situ aspects of the Amphibian Conservation Action Plan (ACAP).

Frogs Matter.

Jump In.

- To create partnerships among zoos, aquariums, botanical gardens, and private and public institutions (universities, etc.) around the world to ensure the global survival of amphibians.
- To highlight ways in which the public can make positive contributions to conservation through activities in their daily lives.
- To stimulate a sustained and long-term interest in amphibian conservation and related interactions with the wider environment.
- To raise increased awareness about the protection of biodiversity through the conservation of amphibians.
- To position the zoo community as leaders in global conservation.

Long-Term Partnerships

2008 Year of the Frog campaign participants are invited to commit themselves to *ex-situ* conservation programs after the campaign year. The organizers set high hopes on the success of this scheme. Please consider a longer-term participation and join! A long-term commitment of your institution offers the following benefits:

- Raise and donate money for an *ex-situ* amphibian conservation program over a fixed time period of several years and in return receive exciting up-to-date information related to the program.
- The information received can be communicated directly to the visitor. This will boost your institution's credibility and may lead to further donations.
- Engagement in *ex-situ* and *in-situ* conservation becomes a reality.
- Your institution's name will be carried to other countries. Locals and tourists will take note of your involvement.
- A long-term engagement will enrich your activities and lead to an interesting world-wide exchange.
- You add a substantial contribution towards nature's conservation.

10 Good Reasons to Join the Campaign

1. After surviving for 360 million years, one-third to one-half of all amphibian species are in danger of becoming extinct ... potentially the single largest disappearance of a species since the dinosaurs.

Frogs Matter. Jump In.

- 2. Amphibians matter. They play a critical role in the ecosystem as both predator and prey, they perform invertebrate pest control important to agricultural efforts, and their skin has substances that offer promising medical cures for humans.
- 3. The *ex situ* program provides a real solution for those amphibians endangered by the most urgent threat, chytrid fungus. The chance to participate in an effort with a tangible solution, where success is real and viable, shouldn't be passed up.
- 4. Many people don't know the importance of amphibians, nor how threatened they are. This is a chance for zoos and aquariums to excel at one of our most important roles: education.
- 5. This is the first truly global conservation initiative to save endangered animals. Local zoos can and should play a role in this unified effort.
- 6. Participation provides an opportunity to engage your local community in a global crisis.
- 7. The crisis provides a unique opportunity to demonstrate to the world that zoos and aquariums are valid and powerful conservation partners.
- 8. The success of this global collaboration can lay the groundwork for future global conservation efforts.
- 9. Zoos and aquariums must not stand by and watch hundreds of these exquisite species become extinct in our lifetime ... especially when *ex situ* captive breeding provides a viable, yet simple, solution. 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.
- 10. Amphibian Ark demonstrates to humankind what can be accomplished by people working together for a common cause. The result will be empowerment for the public to get involved in solving future problems and responding to future crises.





Frogs Matter.

Jump In.

COMMUNICATIONS AND FUNDRAISING OVERVIEW

amphibian

Critical to the development and deployment of communications and fundraising plans for Amphibian Ark's 2008 "Year of the Frog" is an understanding of the "big picture" ... the goals of Amphibian Ark, its leadership, and its member institutions; some fundamental assumptions about the situation; a look at the many key audiences; and, agreement on measurement criteria.

Goals of Amphibian Ark 2008 "Year of the Frog"

- As the emergency response component of the ACAP, help avert the mass extinction of amphibian species by:
 - Raising awareness and understanding of the situation.
 - Educating all audiences on what must be done.
 - **Raising \$50-\$60 million** in funding through a global call to action.
- By raising awareness and educating the general public through global outreach about the amphibian crisis, international organizations, groups, and individuals will be empowered to preserve nature and wildlife for future generations.

Fundamental Assumptions

- There is **competition for mindshare** in the environmental and ecological discussion.
- The "Year of the Frog" campaign can be likened to a **political campaign**.
 - Focus on simple messages that cut through clutter, unite audiences, and quickly build momentum.
 - Impart a greater sense of urgency to "Turn Out the Vote" to rescue amphibians, utilizing the "Year of the Frog" as the key platform.



Audiences

There are many target audiences for Amphibian Ark, and they are often interconnected.

- Drawing from the key messages, additional messaging will be created and targeted to each audience based upon and for:
 - Level of awareness and understanding of the amphibian crisis.
 - Sophistication level (e.g., scientific community vs. general public).
 - Media, the ultimate audience (e.g., *Scientific American* vs. *People* magazine).
 - Type of potential donor (e.g., corporate vs. philanthropic).



Measurement

- Funds raised
- Message impact
 - Pre- and post-campaign measurement of awareness of amphibian crisis and Amphibian Ark initiative
 - Multiple samples:
 - Public: national and international
 - Corporations
 - o Philanthropists
 - o Educators



Situation

amphibian

The IUCN/SSC Conservation Breeding Specialist Group (CBSG) and Amphibian Specialist Group (ASG) have come together with the World Association of Zoos and Aquariums (WAZA) to form the Amphibian Ark, a high-profile, global program to help ensure long-term survival of those amphibian species around the globe that cannot be saved in nature.

Frogs Matter. Jump In.

Amphibian Ark represents one portion of the larger Amphibian Conservation Action Plan (ACAP), which covers research, assessment, long-term conservation programs, and emergency responses to immediate crises.

It is the emergency response portion of the ACAP – saving species that cannot be safeguarded in nature – for which Amphibian Ark was formed. In performing the emergency response phase of the ACAP, Amphibian Ark provides a high profile, easily identifiable, and interest-generating call-to-action platform for media, donors, the general public, and other stakeholders. In fact, it is a viable anchor for an international communications, marketing, and fundraising plan for the amphibian crisis.

The goal of Amphibian Ark is to save amphibians facing rapid extinction (due primarily to amphibian chytrid) through captive breeding. In what may be mankind's biggest lesson and concerted effort to date in working together to protect our planet, Amphibian Ark will coordinate *ex situ* programs with zoos, aquariums, and other partners, with biosecure facilities placed around the world to shelter, protect, breed, and, ultimately, reintroduce these amphibians to the wild, using global coordination, technical guidance, training, and more.

The communications plan – the 2008 "Year of the Frog" campaign – will raise awareness of the amphibian crisis and, most important, the urgent need to generate funds to execute the emergency response captive breeding phase of the program, ultimately helping to ensure amphibians' long-term survival. Creative, strategic, and tactical communications, special events, and media outreach will be necessary to elevate the dialogue among the general public, corporations, philanthropists, and governments in order to raise the necessary funds for this program.

The 2008 "Year of the Frog" global campaign is designed to generate international awareness and understanding of the amphibian extinction crisis. Without an immediate and sustained conservation effort to support captive management, hundreds of species of these wonderful creatures could become extinct in our own lifetime.

Objectives of 2008 Year of the Frog

The primary objective of Year of the Frog is to position Amphibian Ark as the intuitive choice for companies, organizations, individuals, and other parties to support the global effort to respond quickly to save the most endangered amphibians and help to ensure long-term survival of threatened amphibian species. Specifically:

- Develop, implement, manage, and measure global, targeted, and comprehensive media relations, communications, and special events, including engaging prominent third-party experts and ambassadors.
- Use these programs to raise awareness of the amphibian threat globally among companies, organizations, individuals, political leaders, and other stakeholders.

Frogs Matter. Jump In.

- Cut through media clutter, unite audiences, and quickly build momentum.
- Meet and exceed Amphibian Ark's fundraising goals of \$50-\$60 million by leveraging increased public awareness to motivate potential funding sources.
- Educate and empower the global public to save endangered species and support Amphibian Ark.
- Drive participation in local educational and promotional programs and events.

Execution

The communications and fundraising effort will be executed at multiple levels, each designed to include media relations, education, political outreach, events to garner public participation, and stakeholder communication. Because of the complexity of the relationships and the number of parties involved, it's critical that strong communication is maintained between all.

<u>Global</u>

- Communications: The following communications plan will be implemented on a global basis, working closely with the various international, regional, and national associations. Several key major events that are planned include the official launch of the "Year of the Frog" on New Year's Eve, Kiss a Frog Day, International Day of the Frog on Leap Day, Frog Fashion Week, Wearing of the Green, Olympians Jump for Frogs, and Amphibian Art. These events will serve to generate global awareness of the amphibian crisis, providing a platform from which associations and individual institutions can execute amphibian communication programs and from which corporate partners can develop impactful marketing programs that engage the public. The global campaign will keep the associations fully informed of activities and media results.
- Fundraising: Major global Amphibian Ark corporate sponsors as well as philanthropists (both foundation and individual) will be sought to generate the \$50-\$60 million needed to support the efforts of Amphibian Ark. These sponsors, depending on their investment level, will have exposure at all global Amphibian Ark events and promotions and on all Amphibian Ark media and collateral materials. Payments will be made to the Global Conservation Network, a 501(c)3 that is incorporated as part of the CBSG. Solid communications and media results will support this effort by raising international awareness and understanding of the crisis.



Regional Associations

- Communications: Regional associations will execute amphibian awareness programs customized to their region. These programs, in concert with global and national events and/or created specifically by the organizations, should use the Amphibian Ark-approved global graphics and key messages (as outlined in Section 1) to ensure consistency of messaging throughout the world. Regional association logos can be added to the Amphibian Ark logo for these regional programs.
- *Fundraising:* To further the reach of international efforts, associations will execute fundraising efforts to implement their regional programs as well as to support the global work of Amphibian Ark.

Individual Participating Institutions

- Communications: Individual participating institutions, under the guidance of their regional association, will execute local programs, events, and activities to support what each is doing to participate in Amphibian Ark, whether providing biosecure facilities or educational information to its visitors. These programs should also use the approved Amphibian Ark global graphics and key messages (as outlined in Section 1), but individual institution logos (as well as the appropriate regional association logo) may be added.
- *Fundraising:* Individual institutions may execute their own local fundraising to support their Amphibian Ark participation.

AMPHIBIAN ARK COMMUNICATIONS TOOLS

amphibian

The following are some of the tools that will be used by the global Amphibian Ark campaign to tell the story. These efforts will provide a platform for and complement the work of the regional associations and individual institutions.

Frogs Matter.

Jump In.

Message Development

Amphibian Ark has a newsworthy and compelling story to tell. Clear messaging is the cornerstone to ensure that a consistent, single voice is used in global, regional, and local media outreach, Web sites, materials, speaking engagements, and all communications opportunities. Key messages have been drafted (as outlined in Section 1) that:

- Identify Amphibian Ark as part of the Amphibian Conservation Action Plan (ACAP).
- Position Amphibian Ark as the global thought leader on captive management and the intuitive choice for those wishing to support the emergency response to the amphibian crisis.
- Explain Amphibian Ark's expertise and capabilities.
- Capture the worldwide benefits of this effort.
- Compel stakeholders to get involved:
 - Media to tell the story of the amphibian crisis and what's being done.
 - Public to gain awareness and understanding of the amphibian crisis, prompting personal donations and word-of-mouth communication.
 - Corporations to recognize the importance of the amphibian crisis to the public and to get involved through cause marketing and donations.
 - Philanthropists to recognize the importance of the amphibian crisis and to provide funding to help with the solution.

Ambassadors, Advocates, Spokespeople

To further educate all stakeholders in the global effort, it's important to put "faces" on the stories told. The use of third-party ambassadors will play a key role in Amphibian Ark communication. Many ambassadors have already been identified; others will be added:

- Engage official Amphibian Ark patron Sir David Attenborough to maximize his endorsement of Amphibian Ark.
- Reach out to and engage Jeff Corwin, Terri and Bindi Irwin (Australia), Kermit, Jack Hanna, and other well known experts and celebrities, including zoo and aquarium leaders, political supporters, conservationists, etc.
- Utilize spokespeople at major events, during high-profile interviews, meetings with major companies, etc.

Materials Development

An attention-getting, comprehensive, up-to-date media kit will be developed in both print and electronic form. The global kit will include the materials below. Regions and individual institutions will be encouraged to use this kit and add regional and local elements as appropriate. (A preliminary version of this media kit is included on this CD.)

Frogs Matter. Jump In.

- Press releases
- Fact sheets
- Amphibian crisis background information
- Amphibian Ark executive biographies
- Ambassador biographies and comments
- Case studies (to be developed and updated on an ongoing basis)
- List of participating zoos, aquariums, and other institutions
- Amphibian Ark "Year of the Frog" logo
- Links to amphibian photos, highlighting positive images

Other public relations tools will be created based on regional media nuances around the world to tell the Amphibian Ark story. These tools could include:

- Satellite Media Tour (SMT): Show the story through a pre-scheduled television "tour" featuring interviews with a prominent spokesperson and b-roll (video footage) of amphibians and rescues.
- Radio Media Tour (RMT): Tell the story through pre-scheduled radio interviews featuring program leaders and prominent third parties.
- Public Service Announcements (PSAs): Show and tell the story through attention-grabbing announcements featuring key third parties and share with major television and radio stations.

Media Relations

The global campaign will develop targeted media lists and maximize international and national relationships with reporters, editors, and producers through the following:

- Target individual pitches to the program or publication.
- Conduct deskside briefings with key reporters.
- Involve reporters in select rescues.
- Create a news bureau to identify editorial opportunities.
- Cast a wide international net with unique story pitches to earn media placements.
- Monitor international and national print and broadcast coverage and analyze message pullthrough, provide regular news clips and recap summaries, and capitalize on news coverage by identifying reporters, editors, and producers supporting the cause.

Educational Outreach

The global campaign will help to publicize the national and international learning campaigns that will be developed by the regional associations, including teacher workshops, newspaper partnerships, adopt a species, etc.

Frogs Matter. Jump In.

Digital/Grassroots

The global campaign will develop grassroots programs to generate buzz and drive word-of-mouth communications. These efforts could include:

- Enhancing the current Amphibian Ark Web site (www.amphibianark.org) to share news, provide RSS feeds, build grassroots support groups (Amphibian Advocates, Friends of Frogs, etc.), show rescue videos and photographs of biosecure facilities around the world, entertain and educate children, process donations, etc.
- Developing a blog for Amphibian Ark Web site.
- Partnering with Google Earth to highlight participating zoos and aquariums, as well as the transportation of amphibians to biosecure facilities.
- Identifying, reaching out to, and interacting with science, conservation, zoo and aquarium, and other appropriate bloggers.
- Creating a worldwide online petition to secure names of people interested in supporting Amphibian Ark and the amphibian crisis. This list can then be leveraged to demonstrate public support when approaching potential donors.
- Creating and posting YouTube videos of amphibian rescues.
- Creating an Amphibian Ark MySpace page.

Special Programming

In addition to ongoing media outreach outlined above, as well as media coverage based on the events and activities outlined further in this plan, there are key media partners with whom Amphibian Ark should partner to create special programming. Such media partners will be identified around the world; in the United States, for example, they could include:

- National Geographic: Regular Amphibian Ark programs on the cable channel and ongoing feature stories/updates in *National Geographic* magazine and *National Geographic for Kids* magazine.
- Animal Planet: Ongoing Amphibian Ark programs, including coverage of amphibian rescues, with information on what families can do at home to help protect the environment for amphibians.
- Jeff Corwin Experience: Solicit Corwin to devote portions of his show on a regular basis to the amphibian crisis and Amphibian Ark information.
- Discovery Channel: Ongoing Amphibian Ark programs.
- *Time for Kids*: Ongoing Amphibian Ark features in elementary school publication produced by *Time*.



Sustainable Amphibian Ark Communications

In addition to the media relations activities outlined above, it will be important to establish routine and ongoing Amphibian Ark communication tools. These tools could include:

- Weekly Amphibian Ark updates
 - Send weekly e-mail updates to key media highlighting activities for the week.
- Monthly Amphibian Ark teleconference
 - Hold a monthly Amphibian Ark teleconference with international media to provide updates on rescues and successes.
 - Each call could feature a different participating institution as a case study.
- Monthly Amphibian Ark e-newsletter
 - Send a monthly Amphibian Ark e-newsletter to international media and all stakeholders, providing an update on rescues and successes, special events and activities, corporate sponsors, promotions, etc.
- Blog on www.amphibianark.org
 - Develop a blog on the Amphibian Ark Web site to be updated regularly by Amphibian Ark personnel.
- Amphibian Ark speakers bureau
 - Identify appropriate Amphibian Ark speakers in every participating country.
 - Proactively solicit speaking opportunities and coordinate speakers, working through regional associations.

GLOBAL AMPHIBIAN ARK EVENTS

amphibian

In addition to ongoing and aggressive media outreach as outlined above, the Amphibian Ark global campaign will focus on several major events and activities leading up to and during the "Year of the Frog." These events will serve as opportunities for public involvement in the campaign as well as key media hooks to generate coverage ... which will ultimately benefit sustained fundraising efforts.

Frogs Matter. Jump In.

Global media outreach will be executed around each of these events (except where noted for the internal launch).

Ideas for major global events include:

August/September 2007: Internal Launch of "Year of the Frog" at WAZA and Regional Association Conferences

Use association conferences to build internal momentum for Amphibian Ark and begin seeding program with global media.

- Official "Year of the Frog" media kit (press release, fact sheet, amphibian crisis backgrounder) to be issued to media covering conferences.
- WAZA and other regional association conference spokespersons to use Amphibian Ark key messages in media interviews.
- Media outreach for each conference to be handled by individual association, with support as needed.

November 2007: "Leap of Faith" (Holiday Gift-Giving Program)

Use the holiday gift-giving period to begin to educate the public about Amphibian Ark in preparation for the official launch on New Year's Eve, asking people to take a "leap of faith" by donating to Amphibian Ark to help save amphibians.

- Partner with a major shopping mall developer or international and national retailers for cause marketing programs in which an Amphibian Ark customized mall gift card would be developed and promoted, with a portion of the proceeds to benefit Amphibian Ark. For example, cards might include photographs of frogs in Santa hats, salamanders draped in holly, etc.
- Create "Hop 'Till You Drop" events where a portion of all purchases at the malls or stores on a specified day would benefit Amphibian Ark. Participating shoppers would receive an Amphibian Ark "I Hopped 'Till I Dropped" eco-friendly shopping bag.
- Create an Amphibian Ark holiday greeting card for sale at retail and through participating zoos and other institutions with proceeds to benefit Amphibian Ark.
- Promote the opportunity for holiday gifts to Amphibian Ark (individual or corporate donations) in lieu of traditional gift-giving.



December 2007: 2008 Year of the Frog Global Launch on New Year's Eve

Create multiple high profile, attention-getting events around the world on New Year's Eve to ensure media exposure and buzz for Amphibian Ark.

- Identify iconic New Year's Eve events in 10-20 cities (e.g., Times Square in New York City, Jackson Square in New Orleans, Sydney Harbor in Sydney, Newmarket Square in Amsterdam, Copacabana Beach in Rio de Janeiro, London Eye or Trafalgar Square in London, etc.) and tie in with those events.
- Place an Amphibian Ark ambassador at the event in each city (e.g., Kermit in NYC, Sir David Attenborough in London, Terri and Bindi Irwin in Sydney, etc.).
- Distribute a visible frog or amphibian item to all attendees (frog "ribbit" noisemakers, Amphibian Ark hats, buttons, etc.).
- Create and place two global PSAs, one featuring Sir David Attenborough and another featuring Kermit.
- Create and place regional PSAs featuring other ambassadors.

February 14, 2008: Kiss a Frog Day

Take advantage of the Valentine's Day holiday to use the fun visual of people kissing frogs to draw media attention to Amphibian Ark. (Note: While most countries celebrate some form of Valentine's Day on Feb. 14, there are some that celebrate on an alternate day. In those countries, Kiss a Frog Day could be held on the appropriate date.)

- In Europe, secure famous princesses (possibly Crown Princess Victoria of Sweden, Princess Caroline of Monaco, Princesses Eugenie and Beatrice of the U.K.) kissing a frog to signify their support of Amphibian Ark and to challenge the public to participate in local frog kissing events. (Note: For health and welfare reasons, model or stuffed frogs would be used.)
- Create frog kissing events at zoos, aquariums, botanical gardens, and science centers, using the princess frog-kissing photos as a "challenge" to encourage participation. Anyone who kisses a frog receives an "I Kissed a Frog for Amphibian Ark" sticker and is entered into a sweepstakes for prizes (amphibian stuffed animals, free tickets to the zoo or aquarium, etc.). (Note: For health and welfare reasons, model or stuffed frogs would be used.)

February 29, 2008: International Day of the Frog (Leap Day in U.S.)

Stage multiple amphibian rescues on Feb. 29 and create educational programs around them.

- Invite select media to accompany rescue teams all over the world and report on the rescue.
- Have scientists participating in the rescues do a live feed that can be picked up by schools. Allow selected students to ask questions to create interactive dialogue with the scientists. Programming can be carried online at www.amphibianark.org.
- Partner with Google Earth to provide mapping of rescue locations.
- Secure official recognition of International Day of the Frog by the United Nations.



February/March/July 2008: Frog Fashion Week

Leverage eco-friendly designer to support Amphibian Ark.

- Identify eco-friendly designers (e.g., Stella McCartney) to create an Amphibian Ark t-shirt or scarf for women and a cap or tie for men to unveil at Fashion Week in New York City (February), and show at Fashion Weeks in Los Angeles (March) and Berlin (July).
- Item to be sold at retail, at participating institutions, and at <u>www.amphibianark.org</u>, with proceeds to benefit Amphibian Ark.

March 17, 2008: Wearing of the Green

Use worldwide St. Patrick's Day activities as a platform to wear green in celebration and support of frogs and other amphibians.

- Create Amphibian Ark floats to appear in major St. Patrick's Day parades around the world (e.g., Boston, New York City, Chicago, Toronto, Dublin, Oslo, etc.).
- Sell Amphibian Ark t-shirts from Frog Fashion Week to wear on St. Patrick's Day.

June/July 2008: "Jump for Frogs" (Olympic Track & Field Trials)

Partner with Olympic Track & Field long jumpers and hurdlers to promote Amphibian Ark.

- Invite Olympic track and field long jumpers and hurdlers to wear an Amphibian Ark cap, shirt, or button during warm-ups for the Olympic Trials (identify countries with leading track and field teams that use an official "event" format to choose their Olympians).
- Stage a media event with athletes serving as "coaches" for frogs in a frog-jumping contest.

September-November 2008: Amphibian Art

Develop a high-profile, worldwide art program to continue to build and sustain awareness of Amphibian Ark and provide a media hook to discuss the status of the program.

- Sponsor an art competition requesting outdoor amphibian art (paintings or sculptures), with the winning entries placed in high visibility locations in major cities around the world.
- Identify a well known artist interested in conservation to sponsor and support the program.

OTHER PROGRAMS AND ACTIVITIES

amphibi

Other programs and activities that the global campaign could pursue include:

"The Princess and The Frog" Disney Movie

- This movie, featuring the first African-American princess in Disney history, is slated for release sometime in 2009. Tie-ins that can be pursued include:
 - Feature Amphibian Ark message and logo on movie posters and ads.
 - Run Amphibian Ark PSA prior to all showings of the movie.
 - Use the stars voicing the movie (Anika Noni Rose as princess, frog voice to be determined) to create testimonials in support of Amphibian Ark to run following the movie.

Frogs Matter. Jump In.

 Create a cause marketing tie-in with the eventual DVD release of the movie, with on-package exposure and a portion of the sale price benefiting Amphibian Ark.

Budweiser Frogs

- Work with Anheuser-Busch and Budweiser to create a customized series of spots featuring Frank and Louis (the Budweiser lizards) and the three Budweiser frogs talking about the frogs' endangered status.
- Spots can be seeded virally using You Tube and other social networking sites.

International Amphibian Photo Contest

- Sponsor a photo contest requesting submissions of amphibian photos taken at zoos and aquariums, in the wild, or in back yards.
- Create categories for amateurs (both adults and children) and professionals.
- Photos are uploaded to www.amphibianark.org.
- Winning photos can be on display at zoos, aquariums, and other participating institutions.
- Contest can potentially be sponsored by Kodak, Canon, or another photographic equipment company.

Cause Marketing Merchandise Tie-Ins

The global campaign will work with companies to create a variety of merchandise tie-ins to Amphibian Ark. A portion of the sale of each product would benefit Amphibian Ark. These companies will be solicited as corporate sponsors (e.g., significant cash donation to Amphibian Ark); however, even without corporate sponsorship, their cooperation in creating branded products with a cause marketing tie-in would provide incremental funding as well as outstanding exposure for Amphibian Ark. Opportunities could include:



- Parker Brothers/Hasbro: "Frogopoly" (themed Monopoly game).
- Pepperidge Farm: frog crackers (special version of goldfish crackers).
- Gund: Amphibian Ark stuffed frog.
- Webkinz: Amphibian Ark frog Webkinz with Amphibian Ark activities on www.webkinz.com.
- Sour Patch or Haribo: "Gummy Frogs."
- Harper Books: special edition release of Frog and Toad children's books by Arnold Lobel with Amphibian Ark forward.
- Brown Trout Publishing: frog calendar.
- AT&T: frog ring-tones and cell phone skins.
- Hallmark Cards: series of frog-themed cards.



AMPHIBIAN ARK FUNDRAISING PLAN

Objective

• Raise \$50-\$60 million in funding (corporate, philanthropic, government, public).

Key Targets

- Corporate Partners
 - Develop a tiered corporate sponsorship program and proposal packages, including pricing and benefits.

Frogs Matter. Jump In.

- Identify a "top tier" list of corporations that would be ideal sponsors and schedule meetings to solicit funding.
- Philanthropic Funding
 - Identify appropriate foundations (those that have demonstrated interest in supporting conservation and/or environmental causes).
 - Determine the decision-making and funding cycle, as well as grant proposal formats and deadlines.
 - Write and submit grant proposals.
 - Seek early symbolic grant with high media value and publicize to foster additional funding.
- Government Funding (U.S.)
 - Raise the visibility of the amphibian threat and opportunities among key government decision-makers through a lobbying and awareness campaign.
 - Execute targeted media outreach to "inside the beltway" publications.
 - Conduct lobbying for federal funds and legislative support.
 - Conduct meetings with key agencies.
 - Hold meetings with targeted congressional offices, including personal and committee staff.
 - Recruit champions within government, environmental, and scientific communities to lend third-party voices.
- Government Funding (Other Countries)
 - Create template documents for outreach to other governments for funding.
- General Public
 - In addition to the public funding resulting from the various cause marketing programs outlined above:
 - Provide regional associations and their member institutions with messages and graphics to use for donor solicitation.
 - o Create tools for consumer participation in fundraising
 - Collection boxes at Amphibian Ark displays inviting the public to make a "Leap of Faith."
 - > "Adopt a Species" program for schools and individuals.
 - Personal pledge opportunities.

Section 3 Suggested Campaign Activities

Public Relations and Marketing

Global Campaign

As outlined above, the global Amphibian Ark campaign will plan and execute a variety of major, worldwide marketing programs on behalf of the global Amphibian Ark initiative, including an international public launch of The Year of the Frog at the end of 2007. These programs will be supported with global media outreach, with the goal of raising awareness of the amphibian crisis and the Amphibian Ark program among the public, as well as corporations and foundations.

Frogs Matter.

The global Amphibian Ark campaign will communicate throughout The Year of the Frog with all regional associations, to keep them informed of all activities. Each regional association, in turn, will pass that information on to their membership and participating organizations.

Local Efforts

Local zoos, aquariums, and other participating institutions are encouraged to plan and execute their own marketing and public relations programs on a local level. Such efforts will complement and reinforce the efforts of the global campaign, just as the global campaign initiatives will complement the local activities.

Local marketing and public relations activities should follow these guidelines:

- 1. Make sure messages used in local marketing and public relations activities are consistent with the messages outlined in Section 1 ("Why a Campaign?") of this InfoPack. These messages are consistent with those being used by the global Amphibian Ark campaign.
- Use the approved Amphibian Ark Year of the Frog logo presented in this InfoPack on all collateral materials and press releases related to your local Year of the Frog activities. Additionally, please follow the style guide on this CD outlining proper usage of the logo, including incorporation of local association and institution logos. No other Amphibian Ark or Year of the Frog logos should be used.

3. Use the following paragraphs in all local press releases to explain the global Amphibian Ark program:

amphibian

"One half to one third of all amphibian species are threatened with extinction due to habitat loss, climate change, pollution and pesticides, introduced species, over-collection and, most urgently, a parasitic fungus called amphibian chytrid, a deadly disease that is rapidly eradicating amphibian species throughout the planet. This represents the greatest species conservation challenge in our history. The World Conservation Union (IUCN) Global Amphibian Assessment indicates that hundreds of species face threats that cannot be mitigated in the wild and, therefore, require zoos and other institutions to save them in the short term until adequate conservation measures to secure wild populations can be developed. In response to this crisis, Amphibian Ark (AArk) was formed by the World Association of Zoos and Aquariums (WAZA) and two branches of the IUCN Species Survival Commission (IUCN/SSC) – the Conservation Breeding Specialist Group (CBSG) and the Amphibian Specialist Group (ASG).

Frogs Matter.

Jump In.

Amphibian Ark will help zoos, aquariums, and other participating institutions to save as many amphibian species as possible by bringing into those institutions species for captive breeding that cannot be safeguarded in nature. Amphibian Ark will provide global coordination, technical guidance, training, necessary linkages to other IUCN groups, communications, and guidance on publicity and capital campaigns. The global conservation community has named 2008 'The Year of the Frog' as a means of building public awareness of the amphibian crisis."

4. Identify a knowledgeable spokesperson who can speak to local media about your local institution's efforts on behalf of amphibians, as well as the global Amphibian Ark Year of the Frog program. Develop consistent key messages for your spokesperson, using the information in Section 1 of the InfoPack.

A few ideas for local marketing and public relations activities include (only for those institutions planning to use containers):

- Container decorating contest: Have local students submit designs for decoration of one side of the container in which the amphibians will be housed. (Note that this should cover only one side of the container; the other sides of the containers will bear consistent Amphibian Ark graphics at all locations, and potentially logos of corporate sponsors.)
- "Welcome The Frogs:" Host a housewarming party for the amphibians to welcome them to the neighborhood when the container is installed at your local institution. Include themes, music, and food specific to your local area as a means of helping the amphibians "adapt" to their new surroundings. Invite children to send cards and letters to the amphibians welcoming them to the area. Participants in the event should include institution VIPS and stakeholders, key donors, the public, and, of course, media.
- Adopt an Amphibian: Invite members of the public to adopt, for a fee, one of the amphibians at your institution, with the "parent" to receive "adoption papers" and a special Amphibian Ark supporter i.d. card.

Education

Suggested Education Activities

During the entire duration of the campaign, regional zoo associations should act as information centers for the Amphibian Ark campaign. A special calendar of events should involve a full range of 'days of action,' events, workshops, festivities, etc. in which the focus will be on amphibians (in zoos, but also with community outreach programs).

Frogs Matter. Jump In.

Following are ideas for educational activities that can be executed at local institutions:

Workshops

- All about toads and frogs how do they live, what do they eat, etc.?
- Experiencing the local amphibians and their habitat learn interesting aspects about their life cycles
- Photography
- A year in the life of a frog
- Metamorphosis, reproductive biology, etc.
- Breathing pulmonary breathing, mouth-breathing, skin-breathing
- Amphibian workshop for all senses
- Camouflage / warning: amphibians and their colors
- Sustainable resources "green" workshop

Amphibian Trail

- Create a specific entertaining trail with four-six stations, where visitors can take action by answering questions to receive a prize
- Why protect amphibians?
- Ecological aspects
- Local and exotic amphibians

Activities

- Frog and toad call contest
- Frog-jumping contest
- Clay modeling courses for kids
- Amphibian rally
- Frog masks
- Face painting
- Dice game activities
- Guided tours through backstage areas
- Keeper's talk
- Feeding information shows
- Puppet theatre
- Info Mobile
- Frog origami



- Interactive play-games
- Amphibian tattoos
- Creative corner: A special handicrafts corner for young children

Events

- Storyteller featuring amphibian stories from the public point of view
- Frog Day frogs and toads in myth and tradition
- Frog Party children could visit the "creative corner" and make their own fantastic amphibian masks or have themselves painted at a face-painting station. The best masks can then be selected and awarded zoo prizes.

Frogs Matter. Jump In.

- Amphibian action week (for example, around the International World Water Day on March 21)
- Trail parade "look out for amphibians"

Materials

- Poster exhibition: "What does this campaign hope to achieve?"
 - use *ex situ* captive management programs to help save the amphibians
 - preserve their natural habitats
 - educate the public about the specific threats they face
 - support scientific projects
- Peek boxes a thrilling 'peek box' can be set up: everyone who takes a peek gets a firsthand look at the main threats that amphibians face
- Information brochures
- Leaflets and signs
- Coloring book
- Amphibian quiz-book
- Memory cards
- Puzzle rally
- Amphibian cartoons

Outreach Programs

- Habitat conservation actions
- Networking with national and regional organizations and national parks and/or protected areas

Fundraising

Following are ideas for ways local institutions can raise funds to support Amphibian Ark:

Sell amphibian merchandise

• The Amphibian Ark campaign has selected various amphibian merchandise items that can be sold in zoo shops (see Section 4). Part of the revenue can be donated to the campaign. Local institutions can also develop their own amphibian merchandise items.

Frogs Matter.

Solicit cooperation of companies that have a frog in their logo

• Many companies and organizations use amphibians in their logo. Contact these companies to support your campaign, either financially or in another way.

Adopt a frog

 Offer visitors the possibility to adopt amphibians in your collection during the campaign period.

Collection boxes

• The easiest way to collect funds is by putting up a collection box near your amphibian campaign exhibition or amphibian enclosures in the zoo. Money-spinners are present in many zoos and can be decorated with the campaign logo and amphibian images for the campaign. You can also design your own frog money collector that croaks at every coin that is thrown in!

Award donations

• Stimulate donations by providing a small gift (e.g., frog sticker or button) to all visitors who donate money.

Amphibian quiz, puzzle, or trail

• Develop an amphibian puzzle or quiz that visitors can buy at the entrance and complete during their zoo visit. This can be extended to a "Frog Trail" that leads visitors through the zoo with activities at various locations.

Guess the weight contest

Visitors can guess the weight of an amphibian species in your collection for a small fee.
 Various prizes can be awarded to the person(s) whose guess is closest to the actual weight of the animal.

Organize an auction or raffle

 Collect as many amphibian-related products as you can find and organize a raffle or auction where visitors can win or buy these special collectors items. This auction could be on site, or online.



Involve artists

• Local artists might be willing to make a painting, drawing, or sculpture that you can sell to zoo visitors in an auction or give away as a prize in one of your amphibian contests.

Frog hop race

• A sponsored run is always a very effective way to raise funds. For the amphibian campaign, you could adapt this to a frog hop race where participants are sponsored for the distance they can cover hopping like a frog.

Face painting

• Children can get their face painted as a frog or salamander for a small fee.

If we do not have any amphibians in our collection, how can we get involved?

All zoos and aquariums can link their collections to the story of the amphibians and the campaign, not just those that actually house amphibians. Non-amphibian holding members can develop related displays and activities by focusing on the following aspects:

- 1. amphibians in ponds and pools on zoo grounds
- 2. educational panels on the food chain next to exhibits on amphibian-feeding predators
- 3. simply referring to our obligation to support activities that lead to conservation or biodiversity



Frogs Matter.

Jump In.

Section 4 Merchandise

amphibian

Selling merchandise in your souvenir shop is a good way to raise funds for the Campaign ... that is, if you allow part of the profit from the sales to go to the Campaign. This can be done in addition to putting up a collection box and/or organizing all kinds of activities to collect money for the Year of the Frog Campaign.

Source Your Own Amphibian Ark Year of the Frog Merchandise

Registered participants in the Campaign are encouraged to produce their own products to support the Campaign financially. The Amphibian Ark Year of the Frog logo must be used on these products.

To assist you in setting up a special Amphibian Ark Year of the Frog Campaign corner in your gift or souvenir shop, the campaign has made arrangements with a number of companies to prepare special merchandise with the official Campaign logo. Of course, you can also produce your own souvenir products, for which we sincerely hope you will contribute a part of the profit made to the Campaign.

For further information on available amphibian Campaign merchandise, please refer to the Amphibian Ark and WAZA Web sites. Merchandise information will be regularly updated during the Campaign period in the "Shop."

Section 5 Campaign Guidelines

amphibian



Frogs Matter.

Jump In.

Participation and Registration

The 2008 Year of the Frog Campaign will be officially launched on New Year's Eve 2007 and will last through December 2008. Members of Regional Associations of Zoos, Botanical Gardens, and Aquariums are invited to join the Year of the Frog Campaign. A registration form for participation is available in this InfoPack. The form should preferably be completed and returned before January 2008, although it is also possible to register throughout the year.

Campaign InfoPack

This InfoPack contains information that participating institutions can use for Campaign activities throughout the year, as well as information on the rules and guidelines of the Campaign and useful information on amphibian biology and conservation status.

Information Updates

Throughout the year, all participating institutions will be kept updated on the developments of the 2008 Year of the Frog Campaign on the regional Web sites; we suggest regions develop their own Web sites accordingly. Regional associations should keep themselves updated through the Amphibian Ark Web site (<u>www.amphibianark.org</u>), WAZA Web site (<u>www.waza.org</u>), and newsletters.

The main focus of the information updates will be successful fundraising and awareness activities from participating institutions, as well as other relevant information. Please send your campaign updates to the Regional Campaign Coordinator.



Contact

Registration Form:

Each regional association should name a Regional Campaign Coordinator or Representative for each area in order to help promote and support the 2008 Amphibian Ark Year of the Frog Campaign. Regional Associations may approach private institutions and universities to participate and support the campaign under their responsibility. All institutions interested in participating should submit an application for an InfoPack to the Regional Association's Office. The regional association will be responsible for the distribution of Campaign information.

Registration Form

Those who would like to participate in the 2008 Year of the Frog Campaign should complete this form and return it to WAZA as soon as possible.

By signing this form, your institution declares that:

- All photographs and other publicity material contained in the InfoPack will only be used to support the 2008 Amphibian Ark Campaign, following the relevant copyright details (see "use of images"). Full credits must be given when using the photographs.
- 2. When raising funds for the campaign, these funds must be transferred to the campaign's account (see "fundraising money transfer details").

Name of Institution:
Date:
Name & Signature:
Contact person for the 2008 Year of the Frog Campaign:
E-mail address:
Fundraising goal (in dollars/Euros):
Estimated start date of the Campaign in your institution:
Estimated closing date of the Campaign in your institution:



Please return the completed Registration Form to:

WAZA Executive Office 3012 Bern, Switzerland phone: ++41-31-300 20 30 fax: ++41-31-300 20 31 e-mail: waza.secretariat@bluewin.ch waza.director@bluewin.ch

Use of Images

Amphibian Ark has been incredibly fortunate to have been supplied with a generous number of images for the 2008 Amphibian Ark Year of the Frog Campaign by a number of photographers across the world. All of the images have been compiled by Kevin Johnson on the Amphibian Ark staff and they are available for use in the Campaign, free of charge, by all participating institutions as part of their Campaign activities. These images can be found at:

Frogs Matter. Jump In.

http://zims.isis.org/aark/YOTF%20Campaign%20Pack%20images/Forms/AllItems.aspx.

Images available on this site are low resolution; if you would like a higher resolution, please contact Kevin Johnson at KevinJ@amphibianark.org

Please note the following restrictions regarding all images supplied in connection with the Amphibian Campaign:

- The use of the images is restricted to **only by registered participating institutions** to the 2008 Amphibian Ark Campaign.
- Use of images *is only allowed during the period of the Campaign* (December 2007 December 2008). Any signs, brochures, etc. produced for your 2008 Year of the Frog Campaign that contain any of these images cannot be used after the end of the Campaign (December 2008) without special permission. If you need to continue to use them for any reason, contact your regional coordinator.
- Images are to be used only for educational and fundraising purposes and only in material relating directly to the 2008 Year of the Frog Campaign. They are not available for general use.
- If you want to supply any image to an external agency such as a newspaper or magazine, to
 make any commercial use of a picture (e.g., to print on a t-shirt), to place a picture on a Web
 site (other than at low resolution), or to use any picture after the Campaign has ended
 (December 2008), you must contact your Regional Association to request permission. They
 will then contact the owner of the image or will have a pre-arranged process.


- Images are only allowed for use on Web sites of participating institutions in low-resolution format.
- When using any of the images, it is essential that full credit is given to the photographer. The correct credit line is included on the Web site above. If you have any further questions regarding the use of images, please contact your regional representative.

Use of Logos

All printed material associated with the Campaign **must** include the Amphibian Ark 2008 Year of the Frog Campaign logo. The Regional Association and/or individual institution logos can also be included for regional and local initiatives. The Amphibian Ark 2008 Year of the Frog logo and style guide are included on this CD.

An example is shown below:



The correct wording of the Campaign for all printed materials is as follows:

Amphibian Ark 2008 Year of the Frog

The following slogan may also be used: **Frogs Matter, Jump In.** The slogan may be translated as appropriate for each language. For example, if "Jump In" does not adequately translate, the phrase "Join In" may be substituted.

Fundraising Money Transfer Details

Preferably, funds should be transferred bank-to-bank, but if necessary, sending a check is acceptable.

Please make checks payable to CBSG and send to:

12101 Johnny Cake Ridge Road Apple Valley, MN 55124 USA

OR



Please also send an e-mail to Elizabeth Townsend <u>elizabeth@cbsg.org</u> for any other information about making contributions.

Frogs Matter.

Jump In.

Contributions can be also directed to:

WAZA - Amphibians Funds may be wired to UBS AG Basel, Switzerland IBAN Number: CH19 0029 2292 1036 1533 1 Account name: WAZA, World Association of Zoos and Aquariums Account number: 292-10361533.1 SWIFT Code: UBSWCHZH40M

Please also send an e-mail to Elizabeth Townsend <u>elizabeth@cbsg.org</u> every time the fundraising money is transferred to the global account of the 2008 Year of the Frog Campaign. Indicate in this e-mail the amount of money that has been transferred and the name of your institution. If the funds are sent by check, please send the check together with a message stating the name of your institution and amount. This will enable easy labeling once the money arrives on the account.

Please send any funds you raise at intervals throughout the year, rather than waiting until the end of the Campaign. Doing this will enable us to:

- Ensure global survival of amphibians by making possible the Amphibian Ark responsibility to develop, promote, and guide short term *ex-situ* management
- Allow Amphibian Ark to continue its year round amphibian management workshops
- Help fund regional initiatives
- Establish partnerships
- Support Amphibian Ark global coordination
- Send news and updates from these projects during the lifetime of the Campaign
- Send out the Fundraising Certificates for your zoo or aquarium as you reach the Bronze, Silver, Gold, Platinum, and "You Have Saved a Species" levels (see further information in this Section).

Sharing Information and Materials

During and after the 2008 Year of the Frog Campaign, the regional associations will keep everyone in their regions informed of the progress of the Campaign. Ideas for fundraising and awareness activities from your fellow members should be provided to stimulate the membership in successful campaigning and consequently making the 2008 Year of the Frog Campaign a huge success.

Frogs Matter.

Jump In.

We need regional associations' help in order to provide everyone else participating in this campaign with successful ideas for raising awareness and fundraising for the selected projects. Please provide Amphibian Ark and your Regional Association with your success stories, which will then be shared with the rest of participants. Your Campaign activities should be published on the regional Web sites and will also appear on the Amphibian Ark Web site, <u>www.amphibianark.org</u>. Please submit your success stories by writing a brief article in English and submitting it by e-mail to <u>lisette@amphibianark.org</u>. Relevant photos (in jpeg format, at least 300dpi) or illustrations are welcome and encouraged.

Awards and Certificates

amphibian

2008 Amphibian Ark Campaign Special Awards

(Each regional association is free to choose if they want to give these awards)

We do not just want the Amphibian Ark Campaign to be about successful fundraising since not all zoos and aquariums have the same fundraising potential. We are therefore inviting applications for special awards in the following categories:

Amphibian Campaign Education Award

This will be awarded to the most innovative and original school and/or public education program or product produced by any zoo or aquarium in support of the awareness target of the Amphibian Ark Campaign.

Amphibian Campaign Fundraising Award

This award is for the most innovative and imaginative fundraising scheme or event in support of the fundraising target of the Amphibian Ark Campaign. This award will be judged only on the imagination and innovation involved – not on the amount of money raised.

These Amphibian Campaign Special Awards will be presented at the closing of the Amphibian Campaign. The panel of judges will consist of members named by each Regional Office.

Written nominations should be no more than 500 words long and should be supported with photographs wherever possible.



Fundraising Certificates

Special fundraising certificates may be awarded to participating institutions in recognition of the fundraising achievements (to be decided by each regional association). All participants may receive a special Campaign fundraising certificate when they reach – and hopefully pass – the following fundraising targets:

Frogs Matter.

Jump In.

Award Target

(Amounts may be changed by each Regional Association; these serve as an example.) Bronze €2.000 Silver €5.000 Gold €10.000 Platinum €20.000 "You have saved a species" €100.000

These certificates will be sent to the participating institutions as soon as the funds arrive in the Campaign account (see "Fundraising Money Transfer Details"). Please transfer raised funds during the campaign (rather than at the end of the campaign) so certificates can be sent during the campaign as soon as one of the targets has been reached.

Campaign Contacts

Regional Representatives:

The regional representatives for your area are available as contact points in order to help you promote and support the Amphibian Campaign in your zoo or aquarium. They will be able to help with translation of the Campaign materials into your language and provide you with additional sources of information. If they are unable to help you directly, they will be able to put you in contact with someone who can. Furthermore, they may assist in case of media interest in the Campaign.

Please contact your representative if you or your institution can help by either suggesting a sponsor to support the Campaign in your region or by taking on some of the work or responsibility for the promotion of the Amphibian Campaign. Please note that all potential sponsors of the Campaign must be approved by the Regional Campaign Planning Group before work can begin.

Please visit <u>www.amphibianark.org</u> or <u>www.waza.org</u> for a list of regional representatives.

Section 6 Amphibian Information

Introduction

amphibian

The Global Amphibian Assessment of the World Conservation Union (IUCN) revealed in 2005 that one third to one half of the world's 6,000 amphibian species are threatened with extinction and over 120 already disappeared in recent years. The IUCN has previously urged that "All Critically Endangered and Extinct in the Wild taxa should be subject to *ex situ* management to ensure recovery of wild populations." Scientists around the world have recognized that captive management is necessary as a temporary solution and as part of an integrated conservation effort to prevent the extinction of hundreds of additional amphibian species. Fortunately, this conservation challenge is one that the *ex situ* community including zoos, aquariums, botanical gardens, research centers, museums, nature centers, and private breeders is uniquely capable of addressing.



Frogs Matter.

Jump In.

During the 2005 Amphibian Conservation Summit – convened by the IUCN and Conservation International (CI) – the Amphibian Conservation Action Plan (ACAP) was also developed. In that meeting the IUCN/SSC Conservation Breeding Specialist Group (CBSG) was commissioned with the implementation of the ex-situ aspects of the ACAP.

A year later, the CBSG, the IUCN/SSC ASG and the World Association of Zoos and Aquariums (WAZA), set up a collaborative program called Amphibian Ark (AArk) to develop, promote and guide short-term *ex situ* management thus making possible long-term survival in nature of amphibians for which adequate protection in the wild is not currently feasible. The AArk coordinates *ex situ* programs implemented by partners around the world, with emphasis on programs within the range countries of each species, and constant attention to our obligation to couple *ex situ* conservation measures with efforts to protect or restore species in their natural habitats.

The urgent need for the AArk has been recognized for almost two years already. Since then, a considerable number of amphibians have probably been lost (perhaps 10 per year) and the survival of other species is uncertain. The spread of amphibian chytrid which is responsible for the current crisis is relentless and does not weaken, so the imperative to act is stronger now than ever before. The preferred solution is to create "Survival Assurance Populations" in zoos but that requires effort, engagement, and investment on an unprecedented scale. Before that can happen, there needs to be public awareness.

2008 has therefore been designated as the Year of the Frog to optimize the opportunity afforded by a one-year-long focus on amphibians and ensure sustainability of the "Survival Assurance Populations" by creating a cash fund for this conservation work that will extend far beyond 2008.



Amphibians in Danger

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. This is significantly more than any other group of organisms: by comparison, 12 percent of bird species and 25 percent of mammal species are threatened. The IUCN Global Amphibian Assessment (GAA) has alerted us to the fact that hundreds of species face threats that cannot be mitigated in the wild, i.e., they require zoos to save them in the short term until adequate conservation measures to secure wild populations can be developed.

Frogs Matter.

Jump In.

Threats [source: the Global Amphibian Assessment. www.globalamphibians.org]

A variety of threats are impacting amphibian species around the world, causing the massive declines. To better understand the leading threats to amphibians, GAA researchers recorded known threats to each amphibian species using a standardized list (IUCN Major Threat Authority Files <u>http://www.iucnredlist.org/info/major_habitats.html</u>) of major threats. A summary of the number of species affected by each threatening process is shown in Figure 1.







Frogs Matter.

Jump In.

Red List Status [source: the Global Amphibian Assessment. www.globalamphibians.org]

amphibian

A primary goal of the GAA is to assess each known amphibian species with respect to the IUCN Red List categories and criteria <u>http://www.iucnredlist.org/info/categories_criteria.html</u>. These categories provide an explicit framework for determining a species' conservation status, with an emphasis on identifying those at highest risk of global extinction. In this context, the term "Threatened" refers to those species classified under Red List categories of Vulnerable, Endangered, or Critically Endangered.

Of the 5,918 amphibian species assessed, nearly one-third of extant species (32.2%) are globally threatened, representing 1,896 species (Figure 2). This is considerably higher than the comparable figures for birds (12%) and mammals (23%), the only other animal groups for which comprehensive global assessments have been completed. Thirty-four species are considered to be Extinct (EX), and one Extinct in the Wild (EW). Another 2,604 species are not considered to be threatened at present, being classified in the IUCN Categories of Near Threatened (NT) or Least Concern (LC), while sufficient information was not available to assess the status of an additional 1,383 species.

Relative to other animal groups, a particularly high proportion of amphibians are in higher threat categories. For example, 7.7 percent of amphibians are listed as Critically Endangered (456 species) compared with 1.8 percent of birds (179 species) and 3.8 percent of mammals (184 species). Threat levels for amphibians are also undoubtedly an underestimate given that nearly a quarter (23.4%) of species are too poorly known to assess (i.e., Data Deficient), and a significant proportion of these are likely to be globally threatened. Comparable figures for birds and mammals are 0.8 percent and 5.3 percent respectively.

Documenting population trends is a key to assessing species status, and a special effort was made to determine which species are declining, stable, or increasing. The GAA found declines to be widespread among amphibians, with 42.5 percent of species reported to be in decline. In contrast, 26.6 percent appear to be stable and just 0.5 percent are increasing. Because trends information is not available for 30.4 percent of species, however, the percentage of species in decline may actually be considerably higher.



Figure 2. IUCN Red List Assessment for all 5,918 Known Amphibian Species



Extinctions [source: the Global Amphibian Assessment. www.globalamphibians.org]

Extinctions are notoriously difficult to confirm. Using the most conservative approach to documenting extinctions, just 34 amphibians are known to have become extinct since the year 1500. Of greater concern, however, are the many amphibians that are missing and can no longer be found. Until exhaustive surveys probing their disappearance can be carried out, these species cannot be classified in the Red List category of Extinct, but rather are flagged as "possibly extinct" within the Critically Endangered category. The GAA documents 130 such possibly extinct species.

Unfortunately, there is strong evidence that the pace of extinctions is increasing. Of the 34 known extinctions, nine have occurred since 1980, including such species as the golden toad (Bufo periglenes) of Monteverde, Costa Rica. Among those amphibians regarded as "possibly extinct," at least 113 have disappeared and have not been seen since 1980. Fortunately, a few amphibians that previously were thought to be extinct have been rediscovered. For example, Atelopus cruciger was not seen in its native Venezuela after 1986, until a tiny population was found in 2003.



Status by Taxonomic Group [source: the Global Amphibian Assessment. www.globalamphibians.org]

Amphibians comprise three major groups, or taxonomic orders: Anura (frogs and toads), Caudata (salamanders and newts), and Gymnophiona (caecilians). Significant differences exist among these groups in both species numbers as well as threatened status. For instance, there is an order of magnitude – more frogs and toads than salamanders and newts, and even fewer caecilians are known. Frogs and toads, with 5,211 species, very much drive the average threat level for amphibians as a whole with 32.1 percent (1,675 species) either threatened or extinct. Salamanders and newts, however, show significantly higher threat levels, with 46.9 percent (251 species) of their species threatened or extinct. Caecilians, in contrast, appear to be relatively secure with just 2.9 percent (five species) threatened. However, two-thirds (66%) of caecilians are so poorly known that they have been assessed as Data Deficient.

Order	Total	EX	EW	CR	EN	VU	NT	LC	DD	% Threatened or Extinct
Anura Frogs & Toads	5,211	32	1	401	659	582	311	2,028	1,197	32.1
Caudata Salamanders & Newts	535	2	0	54	109	86	58	155	71	46.9
Gymnophiona Caecilians	172	0	0	1	1	3	0	53	114	2.9
Total	5,918	34	1	456	769	671	369	2,236	1,382	32.9

Table 1.	Red List	Status	by 7	Faxonomic	Order
10010 11	I to a Liot	0.0.00	~ ,		0.00

Significant difference in threat levels is also exhibited at the level of taxonomic Family, as shown in Table 2. Very diverse families of frogs and toads that are more threatened than the global average include the Bufonidae, Leptodactylidae and Rhacophoridae. Sadly, both species of the Australian endemic family Rheobatrachidae (the gastric-brooding frogs) are now Extinct. Two other families at severe risk of disappearing altogether are Leiopelmatidae (New Zealand frogs) and Rhinodermatidae (Darwin's frogs in Chile and Argentina). Diverse families that are less threatened than the global average include Ranidae, Microhylidae, and Hyperoliidae. Among larger salamander families, Hynobiidae and Plethodontidae exhibit much higher levels of threat than Salamandridae.



Frogs Matter. Jump In.



Darwin's frog (*Rhinoderma darwini*), Chile and Argentina / Photo by Michael and Patricia Fogden



Nasikabatrachus sahyadrensis (a frog), India / Photo by S.D. Biju



Maud Island frog (*Leiopelma pakeka*), New Zealand / Photo by Phillip Bishop



Seychelles palm frog (*Sooglossus pipilodryas*), Seychelles / Photo by Justin Gerlach



Southern gastric-brooding frog (*Rheobatrachus silus*), Australia / Photo by Michael J. Tyler



Table 2. Red List Assessment by Family source: the Global Amphibian Assessment. <u>www.globalamphibians.org</u>]

Frogs Matter. Jump In.

Family	TOTAL	EX	EW	CR	EN	VU	NT	LC	DD	% Threatened or Extinct
Allophrynidae	1	0	0	0	0	0	0	1	0	0
Ambystomatidae	30	0	0	9	2	2	1	13	3	43.3
Amphiumidae	3	0	0	0	0	0	1	2	0	0
Arthroleptidae	51	0	0	3	9	2	3	18	16	27.5
Ascaphidae	2	0	0	0	0	0	0	2	0	0
Astylosternidae	29	0	0	2	11	8	2	5	1	72.4
Bombinatoridae	10	0	0	0	1	4	0	5	0	50.0
Brachycephalidae	8	0	0	0	0	1	1	1	5	12.5
Bufonidae	476	5	1	85	71	52	26	171	65	45.0
Caeciliidae	113	0	0	1	1	1	0	41	69	2.7
Centrolenidae	138	0	0	6	16	29	10	28	49	37.0
Cryptobranchidae	3	0	0	1	0	0	2	0	0	33.3
Dendrobatidae	234	0	0	20	29	16	14	58	97	27.8
Dicamptodontidae	4	0	0	0	0	0	1	3	0	0
Discoglossidae	12	1	0	0	0	2	4	5	0	25.0
Heleophrynidae	6	0	0	2	0	0	0	4	0	33.3
Hemisotidae	9	0	0	0	0	1	0	4	4	11.1
Hylidae	804	1	0	71	64	47	27	431	163	22.8
Hynobiidae	46	0	0	5	10	12	2	11	6	58.7
Hyperoliidae	253	0	0	1	19	29	17	133	54	19.4
Ichthyophiidae	39	0	0	0	0	2	0	5	32	5.1
Leiopelmatidae	4	0	0	1	1	2	0	0	0	100.0
Leptodactylidae	1,238	2	0	145	247	172	61	351	260	45.7
Limnodynastidae	50	0	0	1	7	2	1	37	2	20.0
Mantellidae	158	0	0	7	12	16	12	77	34	22.2
Megophryidae	128	0	0	3	14	27	13	40	31	34.4
Microhylidae	430	0	0	6	27	39	18	177	163	16.7
Myobatrachidae	71	1	0	6	2	4	3	49	6	18.3
Nasikabatrachidae	1	0	0	0	1	0	0	0	0	100.0
Pelobatidae	4	0	0	0	1	0	1	2	0	25.0
Pelodytidae	3	0	0	0	0	0	0	3	0	0
Petropedetidae	102	0	0	3	13	8	10	39	29	23.5
Pipidae	30	0	0	1	2	0	1	21	5	10.0
Plethodontidae	365	1	0	36	82	58	37	91	60	48.5
Proteidae	6	0	0	0	1	1	1	3	0	33.3
Ranidae	666	2	0	19	61	82	60	295	147	24.6
Rhacophoridae	277	18	0	18	51	34	26	64	66	43.7
Rheobatrachidae	2	2	0	0	0	0	0	0	0	100.0
Rhinatrematidae	9	0	0	0	0	0	0	4	5	0
Rhinodermatidae	2	0	0	1	0	1	0	0	0	100.0
Rhinophrynidae	1	0	0	0	0	0	0	1	0	0.0
Rhyacotritonidae	4	0	0	0	0	1	2	1	0	25.0



Frightening Statistics!

 50 percent of ~6,000 described amphibian species, are threatened with extinction. 33 percent known to be threatened plus 23 percent data deficient but believed threatened mean ~3,000 species are in trouble.

Frogs Matter.

- 122: minimal number of amphibian species believed to have already gone extinct.
- 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.
- 10: number (not percentage) of amphibian species North American zoos are currently prepared to manage long term.
- 50: that same number extrapolated (extreme best-case scenario) to the global zoo community.
- 10 percent: portion of amphibian species threatened with extinction that the global zoo community is at best currently prepared to manage.
- 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.

Amphibians as indicators of environmental health and their contribution to humanity

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 treefrog (*Litoria chloris*) and relatives give us a compound capable of preventing HIV infection, the cause of AIDS.

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 United States 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.



Frogs Matter.

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 U.S. 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 ~1,000 cricket frogs (*Acris crepitans*) could consume almost 5 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.

Geographic Patterns [source: the Global Amphibian Assessment. www.globalamphibians.org]

Diversity

Global patterns of amphibian diversity are dramatically illustrated in Figure 3. This map clearly shows certain areas of high global diversity, including tropical South America and tropical West Africa. In contrast to the usual pattern of high species diversity occurring in the tropics, the southeastern United States is a global center for amphibian diversity, being particularly rich in salamanders. The problem of uneven survey efforts around the world, however, complicates interpretation of this map. Regions such as Indonesia, New Guinea, and the Congo Basin are especially likely to be underrepresented on this map due to lack of adequate surveys.



Figure 3. Global Diversity of Amphibian Species



Looking at amphibian diversity from a country perspective, Brazil, with at least 751 species, has the greatest number of amphibians of any country on Earth, followed closely by Colombia. Table 3 lists the 20 most diverse countries and reveals some interesting findings. For instance, Colombia traditionally has been considered to be the richest country for amphibians, but has recently been surpassed by Brazil. Overall, though, these results must be considered in relation to the level of survey effort. Both Colombia and Brazil have received extensive survey efforts in recent decades, and although both countries can be expected to add significantly to their totals, the level of increase is likely to be less than in some of the other highly diverse countries. In South America, Peru in particular is relatively poorly sampled and is almost certain to rise very substantially in its species total, and can be predicted to pass the level of Ecuador. The diversity in Ecuador is, however, remarkable for such a small country.



Rank	Country	Total
		species
1	Brazil	751
2	Colombia	697
3	Ecuador	447
4	Peru	411
5	Mexico	363
6	Indonesia	347
7	China	326
8	Venezuela	298
9	United States	261
10	Papua New Guinea	244
11	India	239
12	Madagascar	226
13	Australia	214
14	Democratic Republic of the Congo	211
15	Bolivia	209
16	Malaysia	202
17	Cameroon	196
18	Panama	195
19	Costa Rica	179
20	Tanzania	162

Table 3. Countries with Most Amphibian Species

Among the Old World countries, the level of survey effort is often much lower than in the Americas. Indonesia can be predicted to be the richest country outside the Americas, but it is doubtful if even half of its species are yet known. It may end up with a level of diversity comparable with Brazil and Colombia. The situation in India is set to change dramatically with over 100 species in the process of description. Very large increases in species totals can also be predicted for Papua New Guinea and the Democratic Republic of Congo, the latter country having received almost no amphibian survey work in the last 40 years.

Countries that are not far behind that are set to pass the 200 species mark include Malaysia, Cameroon, Tanzania, Panama, Costa Rica, and Tanzania. The United States of America and Australia can be predicted to fall down the ranking over time, though the former will remain the most important country for salamanders, with the possible exception of Mexico.



Geography of Threatened Species [source: the Global Amphibian Assessment. www.globalamphibians.org]

A map showing the global distribution of threatened amphibians (Figure 4) reveals patterns very different from depictions of overall species diversity. The greatest concentration of such species—including well over half of the currently known threatened amphibians – is in a relatively limited area running from southern Mexico south to Ecuador and Venezuela, and in the Greater Antilles (details in Figure 5). This region is dominated by species with small ranges, often living in montane areas. Many of these species have been subjected to severe habitat loss, and exposure to the fungal disease chytridiomycosis.

Other important concentrations of threatened species are in the Atlantic Forests of southern Brazil (Figure 6), the Upper Guinea forests of western Africa, the forest of western Cameroon and eastern Nigeria (Figure 7), the Albertine Rift of central Africa, the Eastern Arc Mountains of Tanzania, East Africa and Madagascar (Figure 8), the Western Ghats of India, Sri Lanka (Figure 9), central and southern China, Borneo (Figure 10), the Philippines (Figure 10) and eastern Australia.



Figure 4. Global Distribution of Threatened Amphibians



Figure 5. Distribution of Threatened Amphibians in Central America, Northern South America, and the Caribbean [Source Global Amphibian Assessment]

Frogs Matter. Jump In.



Figure 6.Distribution of Threatened Amphibians in the Atlantic Forest of Brazil. [Source Global Amphibian Assessment]





Figure 7. Distribution of Threatened Amphibians in Cameroon and West Africa. [Source Global Amphibian Assessment]



Figure 8. Distribution of Threatened Amphibians in Madagascar and Eastern Africa. [Source Global Amphibian Assessment]





Figure 9. Distribution of Threatened Amphibians in Southern India and Sri Lanka. [Source Global Amphibian Assessment]



Figure 10. Distribution of Threatened Amphibians in Borneo and the Philippines. [Source Global Amphibian Assessment]





Table 4 lists the 20 countries with the highest number of threatened amphibians. These countries are in many cases different from those listed in Table 3, suggesting that either amphibians in some countries are more susceptible to threats, that threats vary between countries, or that there are other factors influencing the distribution of threatened species.

Rank	Country	Threatened Species
1	Colombia	209
2	Mexico	196
3	Ecuador	163
4	Brazil *	110
5	China	88
6	Peru	81
7	Guatemala	76
8	Venezuela	69
9	India	66
10	Costa Rica	61
11	Honduras	55
11	Madagascar	55
11	Panama	55
14	Cameroon	53
15	Sri Lanka	52
15	United States of	
	America	52
17	Philippines	48
18	Australia	47
18	Cuba	47
20	Haiti	46
20	Malaysia	46

Table 4. Countries with Highest Number of Threatened Amphibians [Source Global Amphibian Assessment]

The countries listed in Table 4 have a particularly great responsibility for protecting the world's threatened amphibians. Colombia, the second-most diverse country, has the highest number of threatened species. The major threats to amphibians in Colombia are habitat loss although there have been many as yet unexplained declines also occurring, and the dramatic topography of the Andes means that many of the amphibians have very restricted ranges making them more vulnerable to threatening processes. Brazil, the most diverse country, is ranked only fourth for number of species threatened, most of which are in the Atlantic Forest region, and has a significantly lower percentage of its amphibians threatened than the global average* (see note below.).

Considering the percentage of a country's amphibian fauna that is threatened provides a stark contrast to the previous table, which focuses on the number of threatened species. Table 5 lists the countries with the highest percentage of threatened amphibians.



Table 5. Countries with Highest Percentage of Threatened Amphibians [Source Global Amphibian Assessment] Note: only countries with 10 or more species are included.

Frogs Matter.

Rank	Country	% Threatened
1	Haiti	92.0%
2	Dominican Republic	86.1%
3	Jamaica	81.0%
4	Cuba	79.7%
5	Puerto Rico	72.2%
6	Sri Lanka	62.7%
7	Guatemala	55.1%
8	Mexico	54.5%
8	Seychelles	54.5%
10	Philippines	49.0%
11	Honduras	47.4%
12	Ecuador	36.5%
13	Chile	36.4%
14	Japan	35.7%
15	Turkey	34.6%
26	Costa Rica	34.1%
17	Colombia	30.0%
18	Panama	28.2%
19	El Salvador	28.1%
20	India	27.6%

The top five countries are all in the Caribbean, and at least 70 percent of all the amphibians in these countries are threatened. Compared to other regions, the Caribbean stands out as the region with by far the highest percentage of threatened species. This is mostly a result of extensive habitat loss as well as some incidents of disease, in particular in Puerto Rico. In Mexico, ranked fifth for diversity, but second for the number of threatened species, more than 50 percent of amphibians are threatened. Severe habitat loss as well as disease outbreak in some regions are the main threats. Most of the other countries in Table 5 are in Central or South America. The main causes of threat here are also disease and habitat loss.

* It should be noted that for certain species endemic to Brazil, it has not yet been possible to reach agreement on the Red List Categories between the GAA Coordinating Team, and the experts on the species in Brazil. The Red List Categories displayed for individual species are those that were agreed at the GAA Brazil workshop in April 2003. However, in the subsequent consistency check conducted by the GAA Coordinating Team, many of these were found to be inconsistent with the approach adopted elsewhere in the world. Under the notes on Red Listing for each species, the likely consistent Red List Category is given for these species, and it is these consistent Red List Categories that are used in the analyses presented here.



Patterns of Endemism [source: the Global Amphibian Assessment. www.globalamphibians.org]

The number and percentage of endemic amphibians by country shows some important patterns. Table 6 lists the 20 countries with the largest numbers of endemic species (i.e., occurring in no other countries), while Table 7 lists the twenty countries with the highest percentage of endemism.

Rank	Country	Country
	,	Endemics
1	Brazil	489
2	Colombia	337
3	Mexico	246
4	Madagascar	225
5	Australia	200
6	United States of America	182
7	Peru	181
8	China	171
9	Papua New Guinea	164
10	Indonesia	161
11	Ecuador	159
12	Venezuela	155
13	India	154
14	Philippines	77
15	Sri Lanka	67
16	Tanzania	65
17	Cuba	57
18	Malaysia	56
19	Cameroon	55
20	Bolivia	53
20	Democratic Republic of the Congo	53

Table 6. Countries with the Most Endemics [Source Global Amphibian Assessment]



Rank	Country	%			
		Endemics			
1	Jamaica	100%			
2	Seychelles	100%			
3	Sao Tome and Principe	100%			
4	New Zealand	100%			
5	Fiji	100%			
6	Palau	100%			
7	Madagascar	99.6%			
8	Cuba	96.6%			
9	Australia	93.5%			
10	Sri Lanka	80.7%			
11	Japan	80.4%			
12	Philippines	78.6%			
13	Puerto Rico	77.8%			
14	United States of America	69.7%			
15	Chile	69.1%			
16	Mexico	67.8%			
17	Papua New Guinea	67.2%			
18	Brazil	65.1%			
19	India	64.4%			
20	China	52.5%			

Table 7. Countries with the Highest Percentage of Endemics [Source Global Amphibian Assessment]

Frogs Matter.

Jump In.

To a considerable extent, the countries with the largest number of endemic species (Table 6) match those with the largest total diversity of species (Table 3), which is not surprising. However, it is noteworthy that several island countries that do not appear in Table 3 do appear in Table 6: Sri Lanka; the Philippines; and Cuba. Brazil and Colombia have many more endemics than any other countries, with Mexico, Madagascar, and Australia each having 200 or more endemics.

The percentage of endemism (Table 7) shows a very different pattern, with six island countries each having 100 percent endemism (none of these with very diverse amphibian faunas). Of the countries with high amphibian diversity (Table 3), Madagascar and Australia (both essentially very large islands) stand out with by far the highest levels of endemism.

In Figure 10, a preliminary look at Endemic Amphibian Areas is provided. This map is based on the same approach adopted by BirdLife International <u>http://www.birdlife.org/</u> in defining Endemic Bird Areas (EBAs) <u>http://www.birdlife.org/datazone/ebas/</u>. We define an Endemic Amphibian Area as any place where at least two species with ranges of less than 50,000 km2 overlap. About 70 percent of amphibians have ranges of less than 50,000 km2 compared with just 25 percent of bird species.



Figure 10. Endemic Amphibian Areas



Figure 10 looks remarkably similar to the global map of Endemic Bird Areas (and also to other priority-setting mechanisms such as CI's Hotspots

http://web.conservation.org/xp/Hotspots/hotspotsScience/. Clearly, amphibians with small ranges are concentrated in generally the same areas as birds. Preliminary results for mammals reveal a very similar pattern as well, suggesting some fundamental biogeographic patterns that tend to span diverse taxonomic groups, with different life history patterns, and different alpha-beta diversity tendencies. These fundamental patterns are clearly key to guiding the development of conservation strategies in the future. A few differences are apparent, though, the most notable being the Appalachian Mountains in the eastern United States of America, which are the world's center of salamander diversity and endemism, and are also extremely rich in other aquatic life forms, such as freshwater fishes, turtles, mussels, and crayfishes.

Our analysis of Endemic Amphibian areas includes Data Deficient species, which perhaps should have been omitted, since these include a number of species currently known only from their type localities, but which may be more widespread. We suspect that if these Data Deficient species are removed, some of the Endemic Amphibian Areas in places such as the Amazon and Congo basins would disappear, resulting in a map even more similar to that of Endemic Bird Areas.

Chytrid Fungus

amphibian

Chytrid fungi were once thought to be predominantly free-living saprophytes, with a few species capable of infecting only invertebrates and vascular plants. In 1998, a new species – *Batrachochytrium dendrobatidis* (hereafter Bd) – was described infecting amphibians. Bd has now been identified in association with amphibian die-offs on every amphibian-inhabited continent. From the site of its introduction, it generally spreads in a wave-like fashion at 28-100km/yr, often destroying entire amphibian communities as it goes. Where it thrives (generally cooler riparian habitats), 50 percent of species and 80 percent of individuals can be expected to disappear within one year. It cannot be stopped in the wild, and it persists for an unknown period of time even after the amphibians disappear. A few species seem able to live with it as adults, likely serving as reservoirs and vectors for future outbreaks. An element of hope: while many species disappear, at least one that declined appears to be coming back after 10 years. For a detailed accounting of Bd and a model regional response, see the Australian's Threat Abatement Plan http://www.deh.gov.au/biodiversity/threatened/publications/tap/amphibians.pdf and Action Plan for Australian Frogs http://www.deh.gov.au/biodiversity/threatened/publications/tap/amphibians/pubs/amphibians.pdf and Action Plan for Australian Frogs

Frogs Matter.

Jump In.

The only way to avoid getting chytrid fungus in your collection is to never bring in another amphibian, from the wild (global or local) or from any other facility (zoo, commercial, lab, etc.). Obviously, this practice would make it impossible for any conservation institution to function! The realistic way to proceed is to do what most/all institutions are already doing – quarantine all incoming amphibians. Many tropical amphibians will be dead by the time a problem is visibly detected; incubation time can be 9-76 days, with most succumbing in 18-48 days. But if animals are suspected to be positive, or just as prophylaxis, an established treatment can be started as soon as they arrive. For others, and for those that die, specimens can be tested for chytrid infection. A simple skin scraping viewed under a microscope can suffice to indicate spores (see online article

<u>http://www.jcu.edu.au/school/phtm/PHTM/frogs/papers/briggs-2003.pdf</u>), histology of samples from the deceased can also confirm infection (see online instruction

<u>http://www.jcu.edu.au/school/phtm/PHTM/frogs/histo/chhisto.htm</u>). The surest technique is the PCR test. Swabbing techniques to collect samples for PCR and a demonstration video are included in this on line <u>http://www.amphibiaweb.org/aw/chytrid/index.html</u>.

Note: all zoos get chytrid sooner or later! While it does require a swift, thorough response, it is not the end of the world. You have probably already had it in your collection and not even known it. The key to managing chytrid is to test all suspicious sick and dead animals, and treat the survivors accordingly. Treating chytrid in captivity is easy and effective; it is the wild situation that is causing us gray hairs!



For Regional Associations that adapt this Global InfoPack for their use, it is suggested that they include here information about amphibians in their regions and a list of amphibians in their regional institutions.

Frogs Matter.

Jump In.

Amphibians Role in Culture and Religion

Humans have viewed amphibians in a variety of fascinating roles. 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 (see section by Adler in Hutchins 2003, also Hofrichter 2000).

Pre-biblical Shamanism, dating back to the Stone Age, is believed to have given rise to all religions. The Shaman was the leader whose essential role was that of mediator between his people and the spirit world. Toads were important to the Shaman for their symbolic value and for creating hallucinogenic brews. In early Asiatic cultures and in the pre-Columbian civilizations of the Americas the toad was regarded as a divinity, the great Mother Earth, the source and the end of all life. The Egyptian goddess of childbirth, Heqet, is usually pictured with a frog's head. Lamps and amulets with frog shapes were placed in Egyptian tombs to repel demons from the underworld.

The Bible. Christian religion does not portray amphibians in such a positive light. One of the plagues of Egypt was an army of frogs sweeping over the land. Note though that the plague of the frogs' mass exodus from water preceded by plague of water pollution and succeeded by plague of insects – how prophetic!

I will smite with the rod that is in my hand upon the waters which are in the river, and they shall be turned to blood. And the fish that are in the river shall die, and the **river shall become foul**, and the Egyptians shall loathe to drink water from the river. (Exodus, 7:15-22)

And if thou refuse to let them go, behold, I will smite all thy borders with **frogs**. And the river shall swarm with **frogs**, which shall go up and come into thy house, and into thy bed-chamber, and upon thy bed, and into the house of thy servants, and upon thy people, and into shine ovens, and into thy kneading-troughs. And the **frogs** shall come up both upon thee, and upon thy people, and upon all thy servants. (Exodus, 7:28-29) And Aaron stretched out his hand over the waters of Egypt; and the **frogs** came up, and covered the land of Egypt. (Exodus, 8:2)

And the LORD said unto Moses: 'Say unto Aaron: Stretch out thy rod, and smite the dust of the earth, that it may become **gnats** throughout all the land of Egypt.' And they did so and Aaron stretched out his hand with his rod, and smote the dust of the earth, and there were gnats upon man, and upon beast; all the dust of the earth became gnats throughout all the land of Egypt . (Exodus, 8:12-13)



Middle ages. Since the Middle Ages, witches and toads have been closely connected. By some accounts, witches cohabited with and even dressed their amphibian associates. Chemicals in the toads' skin made them popular ingredients in magical concoctions. In Shakespeare's Macbeth, the witches chant:

Frogs Matter.

Round about the cauldron go; In the poison'd entrails throw. **Toad**, that under cold stone Days and nights has thirty-one Sweltered venom sleeping got

Boil thou first i' the charmed pot. Double, double toil and trouble; Fire burn and cauldron bubble. Fillet of a fenny snake, In the cauldron boil and bake; Eye of **newt** and toe of **frog**, Wool of bat and tongue of dog, Adder's fork and blind-worm's sting, Lizard's leg and owlet's wing, For a charm of powerful trouble, Like a hell-broth boil and bubble.

Modern indigenous cultures. The hunters in some indigenous tribes of the Amazon rub the skin secretions of the giant monkey frog (*Phyllomedusa bicolor*) into self-inflicted burns. The toxins in the skin secretions induced nausea and hallucinations in the hunters, who claim to then have heightened awareness and increased hunting success (Daly et al. 1992). Aborigines use waterholding frogs (genus *Cyclorana*) as a water source during drought; they dig in dried-up ponds until they find the cocooned amphibians, then squeeze the bladder-stored water out into their mouths. The Amerindians of Columbia rub their hunting darts across the backs of golden dart frogs (*Phyllobates terribilis*), or sometimes stab the frogs with the darts, to poison the dart and create a deadly projectile with which to shoot monkeys from the canopy (Myers et al. 1978).

Popular culture. Kermit the frog, one of the original Jim Henson Muppets, made his television debut in 1955. He continues to charm children of all ages with his talent, warmth, and sincerity.

Some notable Kermit quotes:

"I'm a very lucky frog. I've gone everywhere, done a lot of fun things, and I've met a lot of really nice people. It doesn't get any better than that."

"It's not easy being green."

"It seems to me that if you wait until the frogs and toads have croaked their last to take some action, you've missed the point."



Other pop culture amphibians include the Michigan J. Frog and the Budweiser Frogs. Frogs also show up in stories like the Frog Prince, the Adventures of Frog and Toad, and the Celebrated Jumping Frog of Calaveras County.

Cultural abuses. Biology classes in high schools and colleges generally require a frog dissection laboratory. Some involve using preserved animals; others require the students to kill the frogs with an overdose of ether, by decapitation, or by pithing (scrambling the animal's brain with a sharp wire). None of these options is humane. In any case, the animals have almost certainly been collected from the wild by biological supply companies, usually by the thousands from one small area of habitat. Such overcollecting is likely not sustainable. Most students do not need to dissect frogs or other animals. The career paths they will follow will have nothing to do with animal anatomy. They can learn everything they need to know from detailed textbooks and videos. For those students planning a career in zoology or medicine who need that information, there are alternatives. Video recordings of dissections and virtual dissections are viable options that are readily available. A Yahoo search for 'virtual frog dissection' yielded over 10,000 results, including:

curry.edschool.virginia.edu/go/frog/ www-itg.lbl.gov/ITG.hm.pg.docs/dissect/info.html www.froguts.com/flash_content/index.html step.sdsc.edu/projects95/Frog.Dissection/

In those cases where it is absolutely necessary for the student to use animals, for example, a medical student studying the effect of a new drug on the physiological interactions between nerves and muscles, farm-raised frogs are readily available (www.ranaranch.com, www. researchamphibians.com) and can be euthanized humanely with an appropriate anesthetic (see monograph on diseases).

Another cultural abuse is the consumption of frog legs as human food. The United States consumes over 1.25 million pounds of frog legs annually, primarily from the American bullfrog. Some bullfrog ranches exist, and frog-farming is far better for the environment (in terms of pollution) than raising beef or chicken. However, most of the frogs for restaurants are wild-caught. The method of collection is quite inhumane – a practice called 'gigging' in which the animal is skewered alive on a barbed, metal stick before its legs are cut off and it is tossed back to the water to die. If you choose to order frog legs in a restaurant, ask and make sure they were farm-raised. Unfortunately, bullfrogs have been introduced for human food into places outside their natural range, including Hawaii, many Caribbean islands, Mexico, Venezuela, the Netherlands, Italy, Java, Japan, Thailand, China, and throughout the western United States. Introduced bullfrogs compete with or eat the native animals, and often bring in new diseases. There is a great *discussion* of frog leg consumption at *AmphibiaWeb*:



is the second largest market for frog leg consumption, where the most common species consumed is the Chinese Edible Frog, Hoplobatrachus rugulosus (Jensen and Camp 2003). In just one year, over 6 million Chinese Edible Frogs were imported to Hong Kong from Thailand (Wai-Neng Lau et al. 1999). It is presumed that all these frogs are being collected from the wild since most of the frog farms in Thailand only raise American bullfrogs (Wai-Neng Lau et al. 1999). Given the shear number of frogs collected, this species is likely being overharvested and if this practice continues could wipe out remaining wild populations.

Overharvesting has had devastating effects on amphibians in the United States. In the West, the California red-legged frog, Rana draytonii, began to be exploited for food during the gold rush of 1849 and heavy harvesting continued until the early 1900s (Jennings and Hayes 1985). By the mid-1870s, their numbers had been significantly depleted in the vicinity of San Francisco (Lockington 1879). The overharvesting of this species was driven by a significant commercial demand. Frog legs from California were selling for \$4.09/lb in France at the turn of the century. California red-legged frogs are currently listed as federally threatened and are no longer being harvested, but their populations are still in trouble. To compensate for diminishing wild populations, people began to farm and also release into the wild American bullfrogs, Rana catesbeiana (Jennings and Hayes 1985). Today, American bullfrogs pose a serious threat to red legged frog populations (see introduced species page)." See also the chapter in Hofrichter (2000).

Literature Cited

- Daly, J.W., J. Caceres, R.W. Moni, F. Gusovsky, M. Moos Jr, K.B. Seamon, K. Milton, C.W. Myers.1992. Frog secretions and hunting magic in the Upper Amazon: identification of a peptide that interacts with an adenosine receptor. Proceedings of the National Academy of Sciences 89:1096-3.
- Hofrichter, R (ed.). 2000. Amphibians: The World of Frogs, Toads, Salamanders and Newts. Buffalo: Firefly Books.
- Hutchins, M., W.E. Duellman, N. Schlager (eds.). 2003. Grzimeck's Animal Life Encyclopedia, 2rd Ed. Vol.6, Amphibians. Farmington Hills, MI: Gale Group.
- Myers, C.W., J. Daly, B. Malkin. 1978. A dangerously toxic new frog (*Phyllobates*) used by Emberá Indians of western Colombia, with discussion of blowgun fabrication and dart poisoning. Bulletin of the American Museum of Natural History 161:307-66.

Section 7 How Will My Money Be Used?

amphibian a

The Amphibian Ark Campaign will contribute to the goals of a simultaneous worldwide capital campaign coordinated by the regional associations and organized at the level of the individual institutions. This campaign is mostly focused on *ex-situ* breeding programs and *in-situ* conservation projects related to captive breeding for conservation. Zoos, botanical gardens, aquariums and many scientific/research institutions play an important role in providing *ex-situ* breeding grounds for immediate conservation action.



Frogs Matter.

Jump In.

We recommend that every zoo independently target their normal donor base (public, local corporations, etc.) and more, to raise money for amphibian conservation. It is also suggested that sixty percent (60%) of this money will stay in the region that raised it to fund their amphibian programs, and forty (40%) will go to support Amphibian Ark global coordination. We understand that smaller zoos might do less while larger zoos will do more. We expect that while individual institutions are campaigning to their normal donor base, regional and national associations will engage in a simultaneous program targeting regional and national corporations at a higher level.

The money raised from this global campaign will help fund regional initiatives such as workshops, rescues, cooperatively managed centers and coordination of activities within each region. When raising funds for the global amphibian crisis, everyone will benefit and local zoos will develop campaign exhibitions that will become permanent. It will also allow the Amphibian Ark to implement the *ex-situ* aspects of the ACAP, as well as execute the global communications plan to raise awareness of the crisis. Funds will be made available in accordance with the overall priorities as set by the Amphibian Ark and regional Zoological organizations, therefore local organizations may apply to use global and regional funds. As a result, countries that may not be able to raise too many funds will get the benefit from those who have better capacity of raising funds.

If enough funds are raised it can be turned into an Endowment Fund, which can provide a long-term guarantee for the amphibian conservation activities. This also means that the fund will remain active after the campaign has ended, i.e. funds can continue to come in many years after the campaign is closed.



amphibian

Amphibian Ark and the 2008 Year of the Frog Campaign

Frogs Matter.

Jump In.

Authors

Lissette Pavajeau¹, Kevin C. Zippel², Richard Gibson₃, and Kevin Johnson₄

¹Lissette Pavajeau. Amphibian Ark Communications and Development Officer lisette@ amhibianark.org

²Kevin C. Zippel. Amphibian Ark Program Officer kevinz@amphibianark.org ³Richard Gibson. Amphibian Ark Taxon Officer richard@amphibianark.org ⁴Kevin Johnson. Amphibian Ark Taxon Officer kevinj@amphibianark.org

Corresponding author

Kevin Zippel kevinz@amphibianark.org

Abstract

The world's amphibians are disappearing. More than one hundred species may have already gone extinct and thousands more are threatened with extinction. Many of the threatened species cannot be safeguarded in the wild and require *ex situ* management if they are to persist. The Amphibian Ark (AArk) draws together diverse stakeholders to save select species until *in situ* threats can be mitigated. Amphibian Ark work includes species prioritization, husbandry training, capacity building, fostering partnerships, fundraising, and education. A campaign entitled *2008 Year of the Frog* is helping to raise awareness among governments, media, educators, and the general public, and to support a capital campaign to fund amphibian conservation programs worldwide.

Key Words

Amphibian declines, extinctions, Amphibian Ark, *ex situ*, Year of the Frog Campaign, captive breeding, endangered species.

Introduction

amphibian

Amphibian species are becoming extinct at a pace never before seen among any animal group.

Frogs Matter.

Jump In.

For the first time, scientists have gathered ample evidence to assert that we might be facing the biggest extinction crisis in the history of humanity (McCallum, 2007; Mendelson *et al.*, 2006; Beebee & Griffiths, 2005; Stuart *et al.*, 2004; Blaustein *et al.*, 2003; Carey & Alexander, 2003; Daszak *et al.*, 2003; Kiesecker *et al.*, 2001; Houlahan *et al.*, 2000; Pounds & Crump, 1994). Species, genera, and even families are vanishing at alarming rates. In 2004 the Global Amphibian Assessment (GAA) conducted by the World Conservation Union (IUCN) revealed that between one third and one half of the world's 6,000+ amphibian species are currently threatened with extinction and over 120 have already disappeared (Stuart *et al.*, 2004; Moore & Church this volume).

It is widely believed that many more species may go extinct before we react sufficiently and the current generation will be held responsible for this loss. It is of the utmost importance that we raise awareness among national governments, world media, school educators and the general public regarding the fragility of amphibians and the enormous responsibility that each of us has for trying to safeguard the highest number of species from extinction.

The global conservation community has come forward with a response to this crisis in the form of the Amphibian Conservation Action Plan (ACAP; Gascon *et al.* 2007), the *ex situ* components of which will be addressed by the **Amphibian Ark** (AArk) www.AmphibianArk.org. The AArk is an initiative started by a group of concerned conservation organizations (IUCN/SSC Conservation Breeding Specialist Group (CBSG), World Association of Zoos and Aquariums (WAZA), and IUCN/SSC Amphibian Specialist Group (ASG)) to support *ex situ* actions around the world whereby select species will be maintained in captivity until they can be secured in the wild. Zoos, aquariums, and botanical gardens can play a crucial role as part of the immediate response by providing *ex situ* breeding facilities for some of the most threatened species (Zippel, 2005). The *ex situ* conservation community includes other currently under-utilized components, e.g., universities, natural history museums, government, and the private sector. A response from the *ex situ* community that is proportional to the crisis will require financial and political support from all corners of the world. Zoos as committed advocates of conservation are in the forefront of a worldwide effort and face the challenge of generating attention that translates into resources and good will towards amphibian safekeeping.

Consequently, the Amphibian Ark has launched a global campaign under the name of "2008 Year of the Frog" with the aim of generating support for global and regional amphibian conservation initiatives. Individual and collective support for this campaign will help develop the capacity to coordinate crucial *ex situ* programmes implemented by partner organizations around the world. In the absence of an immediate and sustained conservation effort of this kind, hundreds of species could become extinct in our lifetime.



Captive Management and the Role of Zoos

The GAA alerted us to the fact that hundreds of species face threats that cannot be easily or quickly mitigated in the wild and therefore require *ex-situ* programs to save them until adequate conservation measures can be developed to secure wild populations. Amphibians are often suitable candidates for captive breeding programs as they are relatively inexpensive to maintain compared to other animal groups, many show high fecundity rates and face few behavioural problems under captive conditions (Bloxam & Tonge, 1995; Marsh & Trenham, 2001; Trenham & Marsh, 2002; Wiese & Hutchins, 1994). This conservation initiative is one that the *ex situ* community is uniquely capable of addressing.

Frogs Matter.

Fortunately, a thriving industry already exists that specializes in captive management of animals. Zoos and related facilities worldwide include over 1,200 institutions, employing more than 100,000 staff and receiving about 600 million visitors per year, equivalent to one in every 10 people in the world! Zoos can assist with initiatives such as rapid response rescues, captive assurance colonies, providing animals for release and research, conservation education, capacity building, fundraising and helping to develop species recovery plans.

The *ex situ* conservation community faces many challenges in order to meet these expectations, first and foremost is the need of rapidly increasing capacity. It is estimated that the world's zoos can currently manage viable populations of ~50 amphibian species, amounting to perhaps 10 percent of those requiring *ex situ* intervention. A dramatic increase in resources is therefore needed urgently and, would include construction of additional biosecure facilities wherever they are needed, training keepers and ensuring that resources are appropriately allocated to support these requisite actions. Of course, some zoos are already making valuable contributions to amphibian conservation by, among other things, constructing dedicated facilities in their own and other regions of the world. Zoos are also leading dozens of amphibian conservation programs, including habitat restoration, translocations, conservation education and research, (Zippel, 2005) and region-wide amphibian community rescues (Gagliardo *et al.* this volume). Additionally, there are now several zoo-led courses designed to develop husbandry expertise, including AZA's Amphibian Biology & Management course (Zippel 2007) – which has generated similar courses in Mexico, Ecuador, and Colombia – and Durrell Wildlife Conservation Trust's Amphibian Biodiversity Conservation course (Gupta 2006).

Amphibian Conservation Action Plan

During the 2005 Amphibian Conservation Summit (IUCN, 2005) convened by the IUCN and Conservation International, the Amphibian Conservation Action Plan (ACAP) was drafted (Gascon *et al.* 2007). While the ACAP's greatest conservation priority is *in situ* action, some threats like chytrid fungus cannot currently be addressed in the wild. The 2005 IUCN ACAP white papers state that "survival assurance colonies are mandatory for amphibian species that will not persist in the wild long enough to recover naturally once environments are restored; these species need to be saved now through *ex situ* measures so that more complete restoration of ecosystems is possible in the future." Comparable calls to action are included in the GAA and other IUCN documents. The ASG specifically tasked the CBSG with implementation of the *ex situ* aspects of ACAP's goals.

The Amphibian Ark

amphibian

In 2006 CBSG, WAZA, and ASG founded the Amphibian Ark to develop, promote, and guide shortterm *ex situ* management thus making possible the long-term survival of amphibians for which adequate protection in the wild is not currently feasible.

Frogs Matter.

Jump In.

The Amphibian Ark is rapidly developing capacity to coordinate *ex situ* programs implemented by partners around the world, with emphasis on programs within the range countries of each species, and combining *ex situ* conservation measures with efforts to protect or restore species in their natural habitats. Amphibian Ark's vision is to maintain *the world's amphibians safe in nature*. Amphibian Ark's mission is *working in partnerships in order to ensure the global survival of amphibians – focusing on those that cannot be safeguarded in nature*.

The urgent need for the existence of an organization such as the Amphibian Ark has been recognized for almost two years already. Since then many additional amphibian species have probably been lost and the survival of other species has become increasingly uncertain. While traditional threats like habitat destruction, pollution, and climate change continue to erode away at amphibian biodiversity, the spread of chytrid fungus is alarmingly fast and the imperative to act is stronger now than ever. The AArk solution is to create survival assurance populations in zoos, aquariums and other institutions but that requires engagement and investment on an unprecedented scale.

Members of the Amphibian Ark are WAZA members and WAZA affiliates, members of regional or national zoo associations, ISIS, AArk-approved private partners, and AArk-approved museums, universities and wildlife agencies. Amphibian Ark is led by a Steering Committee made up of a representative from each of the associations of the organized zoo world, aquariums, botanical gardens, museums, and private sector. An Executive branch of the Steering Committee has Co-Chairs from each of the three principal partners (CBSG, WAZA, ASG) and provides strategic guidance and ensures excellent communication with all stakeholders. Advisory Committees are being formed to consult on specific issues; for example, reintroduction, gene banking and veterinary, legal, and ethical concerns. Four officers coordinate all aspects of Amphibian Ark activity; they assist Amphibian Ark members in identifying priority taxa and regions for ex situ conservation work; lead development and implementation of training programmes for building capacity of individuals and institutions; and develop communications strategies, messages, and materials to promote understanding and action on behalf of amphibian conservation. The Amphibian Ark officers make it much easier for all Amphibian Ark partners to contribute effectively to the global effort. The Amphibian Ark activities are just one part of the comprehensive ACAP, the ex situ component which will help stave off many extinctions, but safeguarding these species in situ will be the ultimate measure of success.

2008 Year of the Frog

In 2008 Amphibian Ark will help lead the *ex situ* community in a globally coordinated public awareness campaign "Year of the Frog" (YOTF). The main goal of this campaign is to generate public awareness and understanding of the amphibian extinction crisis and ensure sustainability of the survival assurance populations by creating a cash fund for this conservation work that will extend beyond 2008. The money raised from this campaign will help fund the Amphibian Ark global coordination activities and regional initiatives such as rescue operations, training workshops, cooperatively managed centers, and coordination of activities within each region.

Frogs Matter. Jump In.

The 2008 YOTF campaign will be officially launched in New Year's Eve 2007 and will last until December 2008. Members of regional zoo and aquarium associations, botanical gardens, museums and others are invited to join the YOTF campaign. While we expect individual institutions to target their campaigning at their normal donor base (public, local corporations, etc.), regional/national associations are expected to engage in a simultaneous program targeting regional/national corporations at a higher level and even governments.

Possibilities for long-term relationships/partnerships

The 2008 YOTF campaign participants are also invited to commit themselves to *ex situ* conservation programs beyond the campaign year. The organizers set high hopes on the success of this scheme. A long-term commitment by individual institutions could consist of efforts to raise and donate money for an *ex situ* amphibian conservation program over a fixed time period of several years to be carried out in specific locations across the world. In return, donating institutions can be expected to receive valuable and up-to-date information related to these programs.

Long-term engagements of this kind enrich institutional conservation activities and lead to worldwide co-operation. The reality of conservation both *in situ* and *ex situ* will expand into new domains and the contribution thus made to nature conservation will boost the institution's credibility and may lead to further donations.

Involvement of organizations not holding amphibians

All zoos and aquariums can link their collections to the story of amphibians and the 2008 YOTF campaign, not just those that actually house amphibians. The YOTF campaign information pack will include essential information and graphics to help develop creative displays and activities focusing on, for example, amphibians in danger, threats, extinctions, Red List status, chytrid fungus, amphibians as indicators of environmental health, climate change, geographical patterns, endemism, etc.



The main goals for the 2008 YOTF campaign are:

- To educate our visitors about the threats facing amphibians and raise global awareness and concern.
- To engage the public in amphibian conservation by highlighting ways in which they can make positive contributions through activities in their daily lives.
- To draw the attention of zoos and aquariums to the importance and urgency of amphibian ex *situ* conservation.
- To create partnerships among zoos, aquariums, botanical gardens, private and public institutions (universities, museums etc.) around the world to ensure the global survival of amphibians.
- To raise funds for implementing the ex situ aspects of the ACAP through Amphibian Ark activities, and other amphibian conservation initiatives.
- To stimulate a sustained and long-term interest in amphibian conservation and related interactions with the wider environment.
- To raise increased awareness about the protection of biodiversity through the conservation of amphibians.
- To strengthen zoo communities as fundraisers and global promoters of conservation.

Conclusion

Addressing the amphibian extinction crisis represents the greatest species conservation challenge in the history of humanity. The global conservation community has formulated a response in the ACAP. An integral part of that response is the Amphibian Ark, in which select species that would otherwise go extinct will be maintained in captivity until they can be secured in the wild. Without immediate captive management as a stopgap component of an integrated conservation effort, hundreds of species could become extinct. The outcome of the Amphibian Ark will be that we will have saved hundreds of species from extinction; developed capacity both within our institutions and globally to continue to provide amphibian species with care and protection when needed; formed true partnerships between *ex situ* and *in situ* components of conservation; established a model framework for responding to future species conservation crises; and demonstrated to the world that zoos and aquariums are essential and unique conservation organizations.

References

- Bloxam, Q.M.C., & Tonge, S.J. 1995. Amphibians: suitable candidates for breeding-release programmes. Biodiversity and Conservation. 4:636-644.
- Beebee, T.J.C. & Griffiths, R.A. 2005. The amphibian decline crisis: A watershed for conservation biology? *Biological Conservation* **125**:271-285.
- Blaustein, A.R., Romansic, J.M., Kiesecker, J.M. & Hatch, A.C. 2003. Ultraviolet radiation, toxic chemicals and amphibian population declines. *Diversity and Distributions* **9**:123-140.


- Carey, C. & Alexander, M.A. 2003. Climate change and amphibian declines: is there a link? *Diversity and Distributions* **9**:111-121.
- Daszak, P., Cunningham, A.A. & Hyatt, A.D. 2003. Infectious disease and amphibian population declines. *Diversity and Distributions* **9**:141-150.
- Gascon, C., Collins, J. P., Moore, R. D., Church, D. R., McKay, J. E. & Mendelson, J. R. III (eds). 2007. Amphibian Conservation Action Plan. IUCN/SSC Amphibian Specialist Group. Gland, Switzerland and Cambridge, UK. 64pp.
- Gupta, B. K. 2006. Amphibian Biodiversity Conservation (ABC) Course. Solitaire 17: 11. Houlahan, J.E., Findlay, C.S., Schmidt, B.R., Meyer, A.H. & Kuzmin, S.L. 2000. Quantitative evidence for global amphibian population declines. *Nature* **404**:752-755.
- IUCN. 2005. Amphibian Conservation Summit Declaration. http://intranet.iucn.org/webfiles/doc/ SSC/SSCwebsite/GAA/ACAP_Summit_Declaration.pdf
- Kiesecker, J.M., Blaustein, A.R. & Belden, L.K. 2001. Complex causes of amphibian decline. *Nature* **410**:681-684.
- Marsh, D.M., & Trenham, P.C. 2001. Metapopulation dynamics and amphibian conservation. Conservation Biology 15:40-49.
- McCallum, M. 2007. Amphibian decline or extinction? Current declines dwarf background extinction rate. Accepted manuscript Journal of Herpetology.
- Mendelson III, J.R., & 49 other authors. 2006. Confronting amphibian declines and extinctions. Science 313:48.
- Pounds, J.A. & Crump, M.L. 1994. Amphibian declines and climate disturbance: The case of the Golden toad and the Harlequin frog. *Conservation Biology* **8**:72-85.
- Stuart, S., Chanson, J.S., Cox, N.A., Young, B.E., Rodrigues, A.S.L., Fishman, D.L. & R.W. Waller. 2004. Status and trends of amphibian declines and extinctions worldwide. Science 306:1783-1786.
- Trenham, P.C., & Marsh, D.M. 2002. Amphibian translocation programs: reply to Seigel and Dodd. Conservation Biology 16:555-556.
- Wiese, R.J. & Hutchins, M. 1994. The role of zoos and aquariums in amphibian and reptile conservation, p. 37-45. In J.B. Murphy, K. Adler, and J.T. Collins (eds.), Captive Management and Conservation of Amphibians and Reptiles. Contributions to Herpetology, vol. 11. Ithaca:SSAR.



Zippel, K.C. 2005. Zoos play a vital role in amphibian conservation. See: http://elib.cs.berkeley.edu/ aw/declines/zoo/index.html 26 July 2005.

Zippel, K.C. 2007. Prepare your staff to aid in the amphibian extinction crisis. AZA Connect Magazine February issue: p.67.

The Amphibian Ark

Selections from www.amphibianark.org

amphibian a

The Amphibian Ark vision is the world's amphibians safe in nature and its mission is working in partnerships to ensure the global survival of amphibians – focusing on those that cannot be safeguarded in nature.

Frogs Matter. Jump In.

The Amphibian Ark is a collaborative partnership of WAZA – the World Association of Zoos and Aquariums, the IUCN – CBSG Conservation Breeding Specialist Group, the IUCN – SSC Amphibian Specialist Group, and zoo associations, zoos and aquariums, botanical gardens, and other conservation organizations. The primary goal of Amphibian Ark is to facilitate coordination of the global zoo community's response to the amphibian extinction crisis. Amphibian Ark's undertaking is to support long-term survival in nature utilizing short term ex-situ management of select amphibian taxa for which adequate protection in the wild is not currently possible. Amphibian Ark will coordinate *ex situ* programs implemented by partners around the world, with the first emphasis on programs within the range countries of the species, and with a constant attention to our obligation to couple *ex situ* conservation measures with necessary efforts to protect or restore species in their natural habitats

Amphibian Ark Conservation Plan is one part of a comprehensive Amphibian Conservation Action Plan, and Amphibian Ark task is implementing the *ex situ* component of this plan.

It is NOT a goal of the Amphibian Ark to acquire pretty frogs to exhibit in zoos or sell in the pet trade, but rather to implement agreed priority actions, which may include collection from the wild, but only to meet such goals.

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 percent 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.



Through the Amphibian Ark initiative we will respond appropriately, we will save many species that would otherwise be lost forever, and we will demonstrate to the world that the zoos and aquariums are essential contributors to nature conservation.

Amphibian Ark Organization

Functionally, the Amphibian Ark serves as the *ex situ* branch of ASG's Conservation division, i.e., to carry out the *ex situ* components of the ACAP.

	AS	G	
Conservatio	n R	esearch	Assessment
ex situ in s	situ		

But to help a diverse set of stakeholders achieve that goal, Amphibian Ark is led by three Principal Partners.





A magnified view of the core of Amphibian Ark reveals its functional levels



i) **Principal partners and the Executive Committee** The vision, mission, and priorities of the Amphibian Ark are determined by a triumvirate of conservation organizations: WAZA and two branches of the IUCN SSC (CBSG – Conservation Breeding Specialist Group and ASG –Amphibian Specialist Group). These three principal partners contribute one representative each to form the Executive Committee. The members of the Executive committee are: Jeff Bonner from CBSG – Executive Committee Chair, Gordon Reid from WAZA, Joe Mendelson from ASG

ii) **Steering Committee** The Executive Committee oversees the Steering Committee, which comprises representatives from regional zoo associations, the private sector, and government. The Steering Committee provides strategic guidance on the activities of the Amphibian Ark, including:

- serving as communication conduit for WAZA, CBSG, ASG
- providing a communication mechanism within and among regional zoo associations, private sector, other branches of ASG
- developing and monitoring strategies for implementing the *ex situ* component of ACAP and proposing revisions as necessary
- approving the appointment of Taxon Management Coordinators who initiate the formation of the Taxon Management Groups and leading the production of the Taxon Management Plans
- working on recommendations from the Taxon Conservation Officer and regional groups (e.g., TAGs), fully reviewing the progress of each Taxon Management Group and its associated Plan on at least an annual basis
- overseeing Amphibian Ark membership and requirements for membership



- developing policies to support ex situ plans and programs, including proposal of policies to international bodies and lobby for their adoption
- helping to determine the priorities and activities of the Advisory Committees
- coordinating fundraising and marketing activities
- ensuring excellent communication with all stakeholders

iii) **Advisory Committees** Representatives from each of the Advisory Committees are available for consultation with Taxon Management Groups on species-specific issues and with the Steering Committee on general strategy and policy. Some committees include:

- Data/Population Management Advisory Committee
- Education Advisory Committee
- Ethical Advisory Committee
- Field Conservation Advisory Committee
- Fundraising Advisory Committee
- Gene Banking Advisory Committee
- Husbandry & Biosecurity Advisory Committee
- Legal Advisory Committee
- Marketing/Publicity Advisory Committee
- Rapid Response Advisory Committee
- Regulatory Advisory Committee
- Reintroduction Advisory Committee
- Research Advisory Committee
- Taxon Prioritization Advisory Committee
- Veterinary Advisory Committee

iv) Amphibian Officers

- The Amphibian Program Officer, Kevin Zippel, coordinates all aspects of implementation within the Amphibian Ark initiative to fulfill the mandate for *ex situ* components of the ACAP, and works with and oversees a team of Amphibian Ark officers to accomplish prioritization of efforts for taxa and geographic regions; designs sound conservation plans and management protocols; builds capacity to implement programs; monitors successes and ongoing needs; oversees communication within the Amphibian Ark, to other conservation partners, and to the public; and fundraising.
- Two Taxon Conservation Officers, Kevin Johnson and Richard Gibson, assist Amphibian Ark partners in identifying priority taxa and regions for *ex situ* conservation work and help coordinate among Taxon Management Groups.



Frogs Matter.

Jump In.

• A Communications Officer, Lisette Pavajeau, develops communications strategies, messages, and materials to promote understanding and action on behalf of amphibian conservation and assist Amphibian Ark partner organizations in reaching multiple audiences within AArk organizations, the conservation community, governments, and the public.

v) Taxon Management Groups, Coordinators, and Plans

amphibian

The functional unit of the Amphibian Ark is the Taxon Management Group. Each taxon identified as a priority for *ex situ* conservation will have a Taxon Management Group set up for it by the Amphibian Ark. Taxon Management Group participants are normally those institutions/individuals who are maintaining and breeding the specific taxon. A Taxon Management Plan Coordinator is responsible for developing and implementing each Taxon Management Groups and their associated Taxon Management Plans. Each Taxon Management Group Coordinator's responsibilities include:

- development of a draft Taxon Management Plan for Steering Committee approval; this includes comprehensive management and husbandry guidelines for the taxon
- development of an effective communication network between all management plan participants for the taxon
- liaison with all appropriate regional zoo/aquarium associations, private sector representatives and other ex situ facilities
- in conjunction with relevant Amphibian Ark Officers and with Steering Committee approval, develop/maintain linkages with the in situ conservation component for the taxon
- establish links through the Steering Committee with the other Advisory Groups and other components of the ASG, so that specialist advice is available when needed
- update of the Taxon Management Plan on an annual basis or as requested by the Steering Committee

vi) Amphibian Ark Membership

Participants in the Amphibian Ark ("Members") are organizations or individuals accepted into membership by the Steering Committee, and which shall sign and adhere to the conditions of this Constitution, as they may be amended from time to time.

Frogs Matter.

Members may be any zoological institution, conservation organization, educational institution, research institution, governmental agency, corporate entity, or individual that has a commitment to promoting the conservation of amphibian species through collaborative *ex situ* programs that support the long-term survival of species in the wild. Founding Members are those organizations that are represented on the initial Steering Committee.

Additional Members may request to join the Amphibian Ark at any time by written application to the Steering Committee, stating adherence to items 3.2(a), 3.2(b), and 3.3(a), and agreeing to commit resources to the Amphibian Ark under 3.3(b). New Members will be accepted into membership by a positive vote of at least 2/3s of the Steering Committee.

Obligations of the members

Each Member shall commit to participation in the Amphibian Ark for a 3-year period and shall abide by the policies and decisions of the Amphibian Ark Steering Committee. Each Member shall provide its share of resources to support the activities of the Amphibian Ark as determined by the Steering Committee.

Limitations

No part of the revenues of the Amphibian Ark shall inure to the personal benefit of any Member of the Amphibian Ark or to its representatives. Notwithstanding the above, upon approval of the Steering Committee or bodies authorized by the Steering Committee, employees of Amphibian Ark Members may be fairly compensated for such services as they may render the Amphibian Ark program, and the Amphibian Ark may reimburse Members for the value of services or material assets provided to the Amphibian Ark.



Amphibian Ark – ESCAP: the *Ex situ* Conservation Action Plan

The ACAP outlines four general phases of implementation for the *ex situ* community response:

1. Information gathering and emergency collections; preliminary captive operations.

Operating in response to recommendations from local biologists, national governments, and the various ACAP research branches, rapid-response teams would travel to sites predicted to suffer catastrophic losses to implement pre-emptive collections of animals that will form the basis of captive programs. A prototype of such a program has been used effectively to rescue the frog fauna of a site in Panama.

Frogs Matter. Jump In.

2. Establishment of captive operations in the range countries.

Central to the long-term success of a captive program is the establishment of captive operations in range countries. Infrastructure for such facilities may be reasonably established with portable, modular units (e.g., modified shipping containers) or by simply adapting local warehouses or houses. Local biologists or citizens must quickly be identified, hired, and trained in basic amphibian husbandry. A steady program of internships in established amphibian facilities in other countries will be critical to maintaining intellectual and practical capacity at range-country facilities. Close contact and communication among all facilities in the network must be maintained by a global supervisory staff. Range-country programs will operate in native languages, and will be aimed to ensure that operative protocols are matched to local conditions, culture, and infrastructure.

3. Research and long-term maintenance of captive operations.

In addition to securing captive colonies in small, modular facilities, back-up populations will be secured in larger, multispecies facilities that provide for efficient care, breeding, and research on many species. These larger facilities may be in the range country and/or in facilities and programs outside the range country.

4. Providing animals for research and reintroduction programs

The captive colonies will produce the animals needed to meet long-term research needs and to provide animals for the ultimate goal of reintroduction to natural habitats.



These phases translate into the following specific actions:

1. While it is clear from the GAA that hundreds of species will require *ex situ* intervention, it is not clear to many people which species should be prioritized and how. Several schemes have been proposed, and while it will be up to individual zoos/associations, partnerships, and countries to determine their own priorities, we highly recommend the use of the "Panama decision tool" as a starting point and basis for global consistency.

Frogs Matter. Jump In.

At the Amphibian *Ex situ* Conservation Planning Workshop in Panama, a decision tool was constructed to quantify the appropriateness for a given species to be included in an *ex situ* program. Phase One of the Decision Tree ensures there is justification for an *ex situ* program. It consists of three fundamental questions with "yes" or "no" answers. These questions should be applied to the taxon under consideration, answering each honestly and objectively. Phase Two of the Decision Tree takes those species that have 'passed' Phase One and attempts to prioritize them, i.e., with limited resources (space, staff, money, etc.) which species should have *ex situ* programs established ahead of others. It takes the form of a series of questions with weighted scores. The total score for a species indicates how 'important' an *ex situ* program for the species is in relation to others. Some questions may not be straightforward to answer and will require consultation with colleagues, taxonomic experts and other individuals/groups working with the species. Phase Three of the Decision Tree considers the practical feasibility of initiating and maintaining an *ex situ* program once justified and considered a priority.

This scheme has been successfully applied by EAZA in Europe and Madagascar (see Appendices E-F), and ARAZPA is working with it in Oceania as well. Amphibian Ark Taxon Officers will help ensure that the Panama tool is applied in new regions and the technique shared so it can spread as quickly as possible. Lists of prioritized taxa will be evaluated and approved by ASG and GAA team members.

1. Species Acquisition

Most species that need help are already in a critical situation and require a rapid response rescue. Ideally, animals would be brought into captivity within their range country. However, if capacity does not exist and cannot be created quickly enough, animals might have to be sent to the nearest biosecure facilities. In either case, Amphibian Ark staff and network can help identify taxa and areas where rapid response is required, provide models and advice on how to do so, even facilitate permits (through the IUCN ASG and Amphibian Ark Regulatory Advisory Committee), but it will likely be up to individual zoos, partnerships, or regional associations to make funding and staff available.

2. Capacity Building

amphibia

Unfortunately, the *ex situ* community is currently lacking the requisite capacity in terms of space, biosecurity, and expertise. The Amphibian Ark is asking that every zoo commit the resources necessary to save a single species, and in most cases, this will require building a dedicated facility, ideally within the range of the species.

Frogs Matter.

Jump In.

3. Facilities

It is estimated that currently the global zoo community has the dedicated space to manage viable populations of ~50 amphibian species, which amounts to perhaps 10 percent of those requiring exsitu intervention. An overlying aim of the Amphibian Ark is to build capacity in the countries where it is most needed, a challenge heightened by the fact that much of the existing capacity exists in the areas where it is least needed. The physical structures needed for captive breeding programs will range from simple, temporary facilities that can be erected adjacent to the species' habitat, to large, specialized multispecies facilities at remote locations. Several models for small, modular captive breeding facilities – e.g., climate-controlled shipping containers – have been developed and tested in Australia, and a model program using available buildings in local villages has been implemented in Panama.

4. Biosecurity

As Gerry Marantelli wisely points out, we would do well to follow the medical community's caveat of 'above all do no harm.' It is essential that animals removed from the wild and intended for eventual release be kept in strict isolation to prevent exposing them to novel pathogens and parasites. The risk is significantly increased as animals cross more or greater biogeographic barriers from their natural range. Moreover, specimens must undergo rigorous health screening prior to return or release to test that isolation has successfully excluded known organisms. If the ex-situ community is to be responsible, for amphibians or any organisms they move, they should not gamble on biosecurity issues and risk becoming the vector for a new disease outbreak in the wild by transfer of foreign pathogens to the range or host country. See Best practices: Quarantine at <u>www.amphibianark.org</u> documents to download. Shipping containers as facilities, because of their self-contained design, seem more conducive to meeting biosecurity needs (treatment on incoming and outgoing water, "bug tight," etc.) than buildings of typical construction.

5. Training Key

amphibian

In staffing these facilities, be they in range countries or abroad, will be training keepers. Several amphibian management training courses exist, including:

Frogs Matter. Jump In.

- AZA's Amphibian Biology & Management is about to run for a fourth time bringing the total number of students trained near 90. Latin American students comprise ~10 percent of that total, with several having gone back to run similar courses in their own countries (Mexico 5/06, Ecuador 12/06, Colombia 2/07). Plans are being made to run similar courses in Peru, Venezuela, and any other country with an interest and will to host.
- Durrell Wildlife Conservation Trust's Amphibian Biodiversity Conservation trained 18 students from 15 countries in its inaugural year, with plans underway to repeat the course in Madagascar and India.
- The Cali Zoo and ALPZA carried out an amphibian management training course in Colombia in March 2007.
- WAZA, VDZ, and DGHT had a similar course in Germany in the summer of 2007
- EAZA is also planning a similar management course.

While this is a wonderful start, we need more training courses throughout the world to continue spreading expertise. A key responsibility of the Training Officer will be to identify areas in need, work with local hosts, identify instructors, secure funds, and implement workshops, an estimated six per year.

6. Management

Managing ~500 taxa at a global level will be no easy task. An Amphibian Ark Taxon Officers are assisting Amphibian Ark partners in identifying priority taxa and regions for *ex situ* conservation work; they are monitoring and communicating needs, existing and planned projects, and gaps in coverage; coordinating taxon *ex situ* conservation programs among institutions, regions, and types of Amphibian Ark partners. The Taxon Officer are working closely with Taxon Management Coordinators to develop Taxon Management Groups and Taxon Management Plans (see Organization above). Taxon Management Plans must include plans for research (e.g., basic amphibian ecology and natural history, emerging infectious diseases and evolution of resistance, toxicity, climate change), and reintroduction in close communication with other branches of ASG.



amphibian

It is currently unknown (and unknowable) how long financial support for *ex situ* programs will be needed. All agree that the Amphibian Ark is a short-lived stopgap measure with the goal of shutting down as soon as it can. Perhaps the needs of some species will be met in five years, others 10-20. But for some, e.g., those impacted by chytrid fungus, there is currently no knowable endpoint to the need for *ex situ* care and programs could endure for decades. Moreover, new species will continue to be described for decades, and new programs will be needed to manage them. New threats will certainly emerge as well, causing previously stable populations to require more intensive management. All indications are that some amphibians will require *ex situ* management (and those programs will require funds) for decades. The zoo industry must evolve to meet the needs of this conservation challenge, reallocating resources and staff to cover all proposed functions of the Amphibian Ark, thereby obviating the need for an independent structure that requires ongoing independent funding. Alas, this too will likely require at least a decade. We therefore assume that the Amphibian Ark will need to aim for a 10-year coordination responsibility.

Frogs Matter.

Jump In.