CASE STUDIES

A Conservation Success Story – Mallorcan Midwife Toad

The Mallorcan midwife toad (*Alytes muletensis*) was discovered in 1977 in the remote, narrow limestone gorges on the island of Mallorca, in the Balearic Islands of Spain. Fossil remains of this species suggest that it was once widespread in Mallorca, but declined to Critically Endangered status due to invasive species and habitat loss. In 1985, a captive breeding program was started to slow the decline, and the first reintroductions took place in 1989. In addition, conservation measures were implemented to assist in the recovery of the existing wild populations. These efforts have been very successful, as both the range and number of populations of the Mallorcan midwife toad have significantly increased. While the current, successful recovery program will need to be continued, the conservation status of the species has improved so much that it is now considered Vulnerable.

The Loss of a Microendemic Species? – Kihansi Spray Toad

The Kihansi spray toad (*Nectophrynoides asperginis*) is only known to exist in the Kihansi Falls, in the Udzungwa Mountains, in eastern Tanzania. Its range covers a tiny area, and searches for the toad around other waterfalls have not uncovered any more individuals. Within its range, the species was once abundant; however, by 2002 the original population of about 17,000 individuals had declined to 1,000, and currently, no spray toads can be found. Scientists believe that if a true decline is occurring, it may be linked to a nearby hydropower project. The project has created a dam upstream on the Kihansi River, which has hugely reduced the volume of water spray at the falls. More recently, chytridiomycosis has been confirmed in this Critically Endangered species, which may also be responsible for the sharp population reduction. A captive breeding program for the toad is underway, and an artificial sprinkler system was installed to create a suitable habitat. The long-term success of these drastic conservation measures remains to be seen.

A Costa Rican treasure – Harlequin Toad

Once common across its range, the dramatically colored harlequin toad (*Atelopus varius*) of Costa Rica and Panama experienced widespread and rapid decline by the mid 1980s. The species could not be found for nearly ten years in Costa Rica, until discovery of a remnant population in 2003 gave conservationists renewed hope that the species may persist as a national symbol of Costa Rica's threatened amphibian treasures. Several researchers, organizations, and the Costa Rican government have united to search for viable populations that can be carefully managed in the wild. These populations will serve as a source for establishing captive colonies, ensuring that the species is not entirely lost. In turn, these colonies will supply offspring for strategic reintroductions into former portions of the species range, thereby increasing chances of survival in the face of epidemics and climate change.

IUCN CATEGORIES

The IUCN *Red List Categories and Criteria* is the most widely used system to determine a species' risk of extinction. The following terms all have specific meanings and are typically capitalized.

- Extinct (EX) - No reasonable doubt that the last individual has died.
- Critically Endangered (CR) - Facing an extremely high risk of extinction in the wild.
- Endangered (EN) - Facing a very high risk of extinction in the wild.
- Vulnerable (VU) - Facing a high risk of extinction in the wild.

For a full listing of categories and criteria, visit http://www.redlist.org/info/categories_criteria.html.

ABOUT CI

Conservation International (CI) believes that the Earth's natural heritage must be maintained if future generations are to thrive spiritually, culturally and economically. Our mission is to conserve the Earth's living heritage, our global biodiversity, and to demonstrate that human societies are able to live harmoniously with nature. www.conservation.org

ABOUT IUCN

IUCN - The World Conservation Union is a global partnership of sovereign States, government agencies and non-governmental organizations – more than 1,000 members in all. It seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. www.iucn.org

ABOUT NATURESERVE

NatureServe is a non-profit conservation organization that provides the scientific information and tools needed to help guide effective conservation action. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems. www.natureserve.org

FOR MORE INFORMATION

Complete data about each species, as well as country and regional breakdowns, are available in a searchable database at www.globalamphibians.org.

Global Amphibian Assessment

CENTER FOR APPLIED BIODIVERSITY SCIENCE at CONSERVATION INTERNATIONAL · IUCN The World Conservation Union · NatureServe A Network Connecting Science With Conservation

WHAT IS THE GLOBAL AMPHIBIAN ASSESSMENT (GAA)?

The Global Amphibian Assessment (GAA) represents the first time that every known amphibian species has been evaluated in order to assess its risk of extinction and distribution.

More than 500 scientists from over 60 countries contributed to the three-year study. The study's results provide the best baseline for monitoring global amphibian conservation, and will be used to design strategies to save the world's rapidly declining amphibian populations.

The black-eared mantella of Madagascar is a Critically Endangered amphibian. *Photo © Peter Weish*

WHAT ARE THE MAIN FINDINGS?

The GAA analyzed all 5,743 amphibian species known to science. It found that:

- At least 1,856 species are considered threatened with extinction, representing 32 percent of all amphibian species. By comparison, 12 percent of birds and 23 percent of mammals are threatened.

- At least nine species have gone extinct since 1980. Another 113 species have not been found in recent years and are considered to be possibly extinct. Scientists suspect that many species have declined due to chytridiomycosis, a disease found primarily in the Americas, the Caribbean, and Australia. These numbers suggest that we are experiencing an epidemic number of extinctions – hundreds of thousands of years' worth in just a century.

- 43 percent of all species are in population decline – fewer than one percent are increasing. Twenty-seven percent are stable, and the rest are unknown.

- 427 species are considered Critically Endangered (CR), 761 are Endangered (EN) and 668 are Vulnerable (VU). More information on these categories appears on page four of this fact sheet.

- Scientists estimate that the conservation status of 435 amphibian species has worsened since 1980.

WHAT ARE AMPHIBIANS?

Amphibians are a group of animals that include frogs and toads, salamanders and caecilians. The members of the Class Amphibia were the first terrestrial vertebrates, successfully colonizing the land about 350 million years ago. Amphibians have developed a remarkable diversity in life histories by adapting to many different aquatic and terrestrial habitats. Many of the species undergo a classic metamorphosis during their lives, as they develop from the familiar aquatic larvae to terrestrial adults. Other species may both metamorphose and spend their entire lives in either aquatic or terrestrial habitats, and in some species the young may even be born as miniature versions of the adults. Amphibians are today present on every continent except Antarctica, and can be found in almost all habitat types from dry, inhospitable deserts to lush tropical rainforests. While a few species are widespread and abundant, many more amphibians are found in specialized habitats that are often disappearing.

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MORE GAA RESULTS

Countries with the Largest Numbers of Threatened Species

Numbers in parentheses represent the number of threatened species, defined by the IUCN as Critically Endangered, Endangered, and Vulnerable.

1) Colombia (208) — Colombia has the second highest number of amphibians in the world, but the most threatened. Many of these species are endemic to the Colombian Andes, Chocó region, Caribbean coastline and Amazonian lowlands. The ongoing loss of habitat in montane areas, as well as unexplained declines in good habitats, have led to the decline and possible extinction of many species.

2) Mexico (191) — Mexico has 57 Critically Endangered species – more than any other country. A combination of chytridiomycosis and extensive habitat loss are threatening more than half the country's amphibians with extinction.

3) Ecuador (163) — In addition to the extensive habitat loss that has taken place in the Chocó and Andes regions of Ecuador, a number of species native to Ecuador have been found to have chytridiomycosis. At least two of Ecuador's amphibian species are now extinct.

4) Brazil (110) — Brazil has the greatest number of amphibian species in the world, with many new species still discovered each year. However, a number of unexplained amphibian declines have occurred, especially in the heavily degraded Atlantic forest region.

5) China (86) — China is especially rich in amphibian species in the Provinces of Sichuan and Yunnan. However, many of China's amphibians are threatened by habitat loss, pollution, and by overharvesting for both medicine and food.

6) Peru (78) — Although much of Peru's Amazonian forest remains, large-scale habitat loss has occurred throughout much of the Peruvian Andes. Many locally endemic species are now threatened, and the recent discovery of chytridiomycosis in this country is worrying.

7) Guatemala (74) — Amphibians in Guatemala have primarily been affected by deforestation. There is also evidence of chytridiomycosis among some species, particularly in high-elevation areas.

Other countries with large numbers of threatened species include Venezuela (68); India (66); and Costa Rica (61).

Countries With the Highest Percentage of Threatened Species

1) Haiti – (92%; 46 of 50) More than nine of every ten amphibians are threatened here, of which 62 percent are Critically Endangered. The country has been stripped of almost all of its original habitat, and the country is regarded by many scientists as an environmental disaster. The threatened amphibians are concentrated heavily in the Massif de la Hotte in the southwest of the country.

2) Dominican Republic – (86%; 31 of 36) Sharing the island of Hispanola with Haiti, it is not surprising that the Dominican Republic has the second highest percentage of amphibians under threat. Habitat destruction is also the main cause of threat here.

3) Cuba – (81%; 47 of 58) This Caribbean island has experienced significant habitat loss, but mysterious and sudden disappearances suggest that the disease chytridiomycosis may also be playing a role.

Other countries with a high percentage of threatened species include:: Jamaica (81%); Puerto Rico (72%); Guatemala (55%); Seychelles (55%); Mexico (54%); Philippines (49%) and Sri Lanka (47%).

Red-eyed tree frog of South and Central America *Photo © CI*

WHO ARE THE AMPHIBIANS?

Frogs and Toads

More than 5,000 frog and toad species are currently known. Frogs and toads are tailless amphibians that are most readily identified by their long hind legs. Species vary greatly in size; while many are only a few centimeters long, the West African Goliath frog can reach a size of about 30 cm (11.8 in.). Frogs and toads are present throughout most of the world's habitats, and while some familiar species are very common, many others are rare and restricted in their habitat requirements.

Salamanders and Newts

Salamander and newt species generally have long tails, and they usually have two pairs of legs that are equal in length. Many of the 508 known species are quite small, averaging about 10 to 15 cm (4 to 6 in.) in length. Still, the Chinese Giant Salamander can reach a size of about 1.5 m (5 ft.). Salamanders and newts are found throughout most of North and Central America, Europe, and much of Asia. They are also present in South America and North Africa, although there are fewer species in these areas. They inhabit a wide range of habitats; species can be found from under tree bark on high mountains to garden ponds in lowland areas. Salamanders and newts have many different courtship patterns and, with the exception of a few species, reproduce by internal fertilization.

Caecilians

Caecilians are elongated, limbless amphibians that are often highly specialized for burrowing. They are the least known of the three Orders of amphibian, with species found in Central and South America, Africa, and Asia. Many of the 168 known species are found on land, burrowing in soils or leaf litter, while others are completely aquatic. To move, caecilians generally use their strong skulls and muscular bodies to push themselves through the ground or to swim in aquatic habitats. It is believed that all caecilians have internal fertilization. The more primitive species have aquatic larvae, while the more advanced caecilians undergo the direct development of eggs into terrestrial young, or may even give birth to live young.

Pair of marbled salamanders of North America *Photo © Don Church*

WHY ARE AMPHIBIANS IMPORTANT?

Amphibian species are particularly sensitive to environmental change. They are often the first animals to noticeably decline in areas just beginning to experience environmental degradation. For this reason, amphibians are considered to be important *bio-indicators*, meaning that the status of their populations can be used to monitor the health of the surrounding ecosystem. While deforestation and pollution are two well-known causes of amphibian decline, some species are undergoing declines in seemingly undisturbed habitats. These population changes may indicate environmental deterioration that otherwise would not be visible. Some scientists believe that the subtle environmental changes created by global warming could be contributing to these mysterious die-offs, with sensitive amphibian species suggesting the fate of other forms of life.

CHYTRIDIOMYCOSIS

Chytridiomycosis, a highly infectious fungal disease, has been confirmed as the primary cause of a number of amphibian extinctions, and it is suspected to have caused the decline of many other species. The disease is severely affecting amphibian populations in the Americas and Australia, and there are reported outbreaks in Europe, Africa, and Asia. There is still very little known about the origins of the disease, how it is spread, or which species are most likely to be susceptible.