Amphibian Conservation

Facts

Frogs with extra limbs, missing limbs, or grossly misshapen limbs have been observed across the US

Deformities have been reported in more than 70 amphibian species from more than 30 states

Deformed frogs typically do not survive to adults

Deformities can occur in 25% of more of some amphibian populations

No single cause can explain these deformities, but infection by a flatworm parasite called *Ribeiroia* has been linked to many malformation "hotspots"

Parasites burrow into the limbs of developing tadpoles, leading to death or malformations

This parasite is not known to be infectious to humans, but it does threaten amphibian populations

Amphibians play an important role in food webs both as predators of insect pests and as food for herons, raccoons, and snakes

Frogs, toads and salamanders are disappearing from many parts of the world at an alarming rate

Conservation efforts

We do not yet understand what factors control parasite abundance or how malformations affect frog populations over the long term

Available evidence suggests that runoff and pollution can increase parasite infections in frogs

You can help by limiting your use of fertilizers and pesticides on your lawn, which tend to runoff into nearby wetlands where amphibians live

You can also help by reporting your observations of malformed frogs (see contacts on following page)

We are working to determine how deformities affect frog populations over time

How you can help

Observe frogs and other amphibians you encounter for missing limbs, extra limbs, or deformed limbs

Report frog deformities at the websites below, and include photos and location information

North American Reporting Center for Amphibian Malformations (google "narcam")

Dr. Pieter Johnson Laboratory, U. Colorado
www.colorado.edu/eeb/facultysites/pieter
email: pieter.johnson@colorado.edu

Learn more about amphibians and their conservation issues at www.amphibiaweb.org

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What's with the FROGS?

Frog deformities and their causes

What causes deformities?

What we know...

Infection by the parasite *Ribeiroia ondatrae* is an important cause of deformed frogs, including frogs with extra limbs, missing limbs, or twisted limbs

Ribeiroia is a flatworm (or fluke) with a multi-host life cycle

To complete its life cycle, this parasite must infect not only frogs, but also freshwater snails and frog-eating birds, such as herons

Deformed frogs do not survive to adulthood

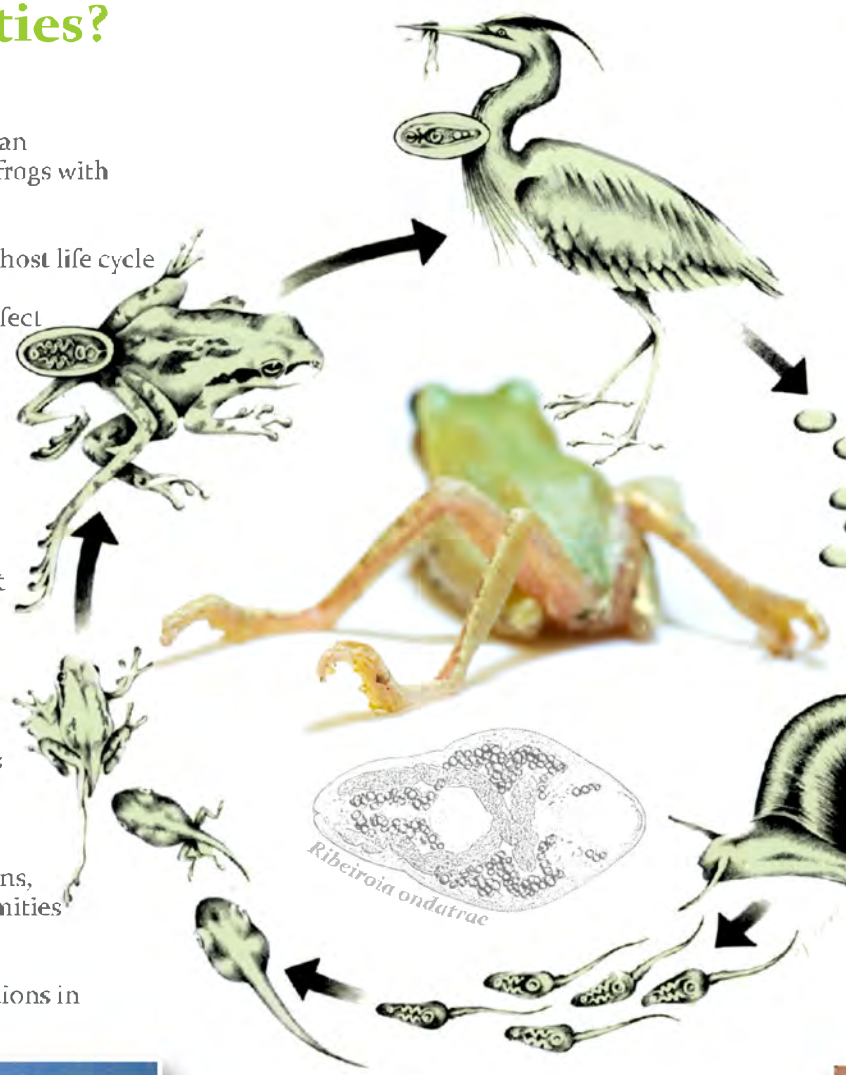
Deformities may help the parasite by increasing the chance that infected frogs are eaten by birds...yet high levels of deformities could drive local amphibian population extinct

What we don't know...

We still do not understand the factors that control parasite abundance or how deformities affect amphibian populations over time

We still do not understand why deformities appear to be increasing in some frog populations, or why some species of frogs suffer from deformities while others do not

We still know little about how to reduce infections in frogs and help prevent malformations



Current Research

Research lead by Dr. Pieter Johnson at the University of Colorado is examining the dynamics of frog malformations in different amphibian species, landscapes, and food webs across the country. This research is supported by the U.S. National Science Foundation, and involves private landowners and public land management agencies.

Our goals are to:

Determine the distribution of malformations and what species are affected

Explore how patterns of land use and biodiversity influence infection

Assess potential management strategies to reduce malformations in declining frog species

Understand the long-term consequences of deformities for amphibian populations

Needs

We need people to report observations of deformed amphibians (contact info on reverse). If possible, reports should include photographs of abnormal animals, what proportion were deformed, and how many frogs were examined (type of frog, date of observation, location)

The parasite life cycle

The flatworm's eggs hatch in water and infect rams horn snails. Infected snails eventually release large numbers of tiny free swimming parasites, which find and attack the developing limbs of tadpoles. As the tadpoles develop, their limbs become deformed, duplicated, or even fail to grow at all. Crippled frogs make easy prey for birds and other predators, which eventually become infected by the adult stage of the parasite and can then distribute the parasite's eggs to other water bodies through their feces.