

## **Short Sessions ~ 1:15 pm – 2:00 pm**

Resources submitted by:

Amphibian Monitoring Workshop  
Alina Ruiz

Alien Invaders: Exotic Invasion Plant Activity Guide  
Judith Cocus

Hunting for Great Outdoor Learning! Letterboxing, Geocaching, and  
Questing – Claire Hayes

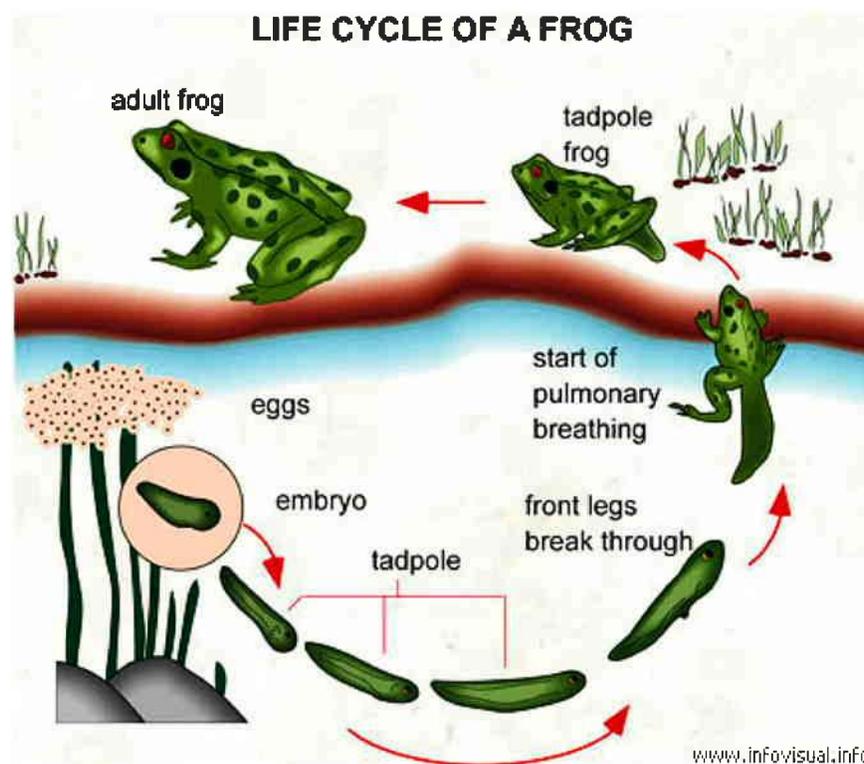
Eating the Garden: Tips on Preparing Delicious Snacks and Meals with  
Children – Seth Freedman

Log on to Grant Writing for Your Outdoor Classroom  
Sarah Visser

## What is an amphibian?

The word *amphibian* means double life. Many species have two phases during their life cycle. As larvae, they live in aquatic environments, and as adults they live mainly in terrestrial environments. Amphibians are ectothermic, meaning they are unable to regulate their own body temperature. Therefore, they must move into areas that provide the right temperature for their survival. Amphibian skin is thin and permeable and is used for exchanging gases. Most species require a water source for survival, and several require water for reproduction.

Many amphibians go through a life change called metamorphosis. During metamorphosis, larvae slowly change from fishlike (completely aquatic animals with gills), to animals better suited for life on land. Lungs are developed, and in the case of frogs, tails are reabsorbed giving way for the development of limbs. The length of time required for metamorphosis varies among different species. Other species have abandoned metamorphosis altogether and retain larval morphology, remaining entirely aquatic throughout their lives. Furthermore, some amphibians have direct development, meaning eggs are laid on land, skipping the aquatic larvae stage.



## There are 3 orders of amphibians:

Order Anura (frogs and toads)

Order Caudata (salamanders and newts)

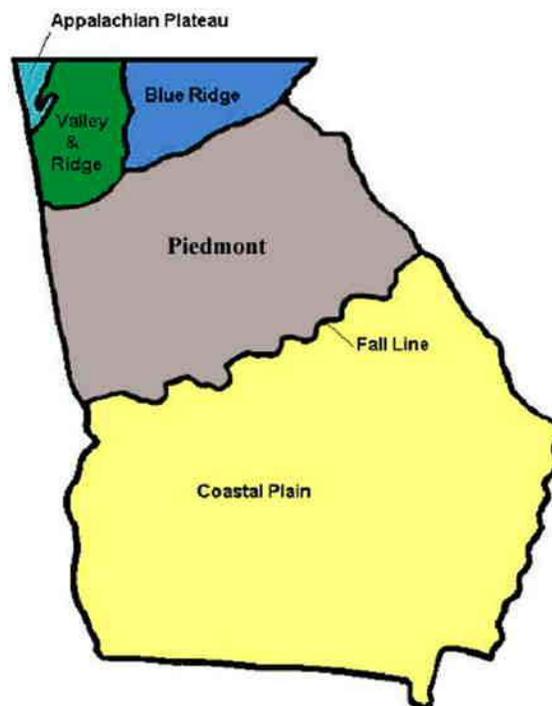
Order Gymnophiona (caecilians)

Amphibians range in size from the giant salamanders in China and Japan, which can exceed 5 feet in length, to the tiny gold frog that only reaches  $\frac{1}{2}$  inch in length. Adult amphibians typically have limbs that enable them to move around on land as well as in the water. Anurans are equipped with hind limbs that are strong and long, which enable them to jump. Webbing of hind toes varies among species (the more aquatic they are the more webbing they will have). Most salamanders have four short legs and a long tail, which they use for balance while walking on land and to propel them through the water when swimming. Caecilians have no limbs at all.

## Range and Habitat

Scientists have recognized more than 6,000 species of amphibians. Anurans are the most abundant, with over 5,000 species. Frogs are the most widespread of all amphibians, inhabiting every continent except Antarctica.

Georgia has the highest diversity of amphibians (and reptiles) in the United States. There are approximately 87 amphibian species. Georgia is made up of several geographic regions, allowing for a high diversity of amphibians.



## Risks to Amphibians

Amphibians have survived for more than 300 million years through numerous and drastic environmental changes that led to the extinction of dinosaurs and many other species. Yet scientists are alarmed by the recent rapid decline of amphibians in many parts of the world. These declines could be caused by natural fluctuations, however, it is very likely that humans are impacting the environment at a greater rate than amphibian species can sustain. Their complex life cycle and permeable skin make amphibians particularly sensitive to environmental disturbances such as drought and pollutants. This sensitivity makes them excellent biological indicators, organisms whose well being provides clues to the health of an ecosystem.

No single factor has been identified as the cause of this disturbing trend. Instead there are a variety of factors that may be responsible:

1. Habitat loss or fragmentation
2. Disease (chytrid fungus)
3. Pollution
4. Climate change (depletion of ozone layer)
5. Invasive species
6. Exploitation



Habitat loss and fragmentation is the number one threat to amphibian species worldwide.

## Monitoring Activities

In Georgia, volunteer amphibian monitoring activities are in their infancy. Without an established protocol, Georgia volunteer monitors rely on vocalizations to assess presence of frogs and photo-documentation to assess the presence of salamanders. Georgia-Adopt-A-Stream amphibian monitoring is a pilot program that hopes to engage volunteers in the process of learning about amphibian populations.

There are 2 different methods volunteers can use to monitor amphibians in their area, tree pipes and cover boards. Tree pipes are typically 3 feet long PVC pipes with a 1 ½ inch diameter. Place tree pipes vertically on the trunk of a large tree (about 4-5 feet from the ground). Make sure the tree is close to a water source. Cover boards can be placed on the ground in a forested area nearby. They are typically 18 inches x 18 inches (1 inch thick) of untreated wood. Make sure to remove all leaf litter so that the board is lying on top of moist, bare soil. Wetland areas are the most ideal sites for both types of monitoring equipment. Report your finding to the website at the bottom of this page.



Tree frog inside of a tree pipe



Cover board in the forest

### References:

Georgia Adopt-A-Stream, Department of Natural Resources, Environmental Protection Agency. Amphibian Monitoring. (2008)

For more information:

[www.georgiaadoptastream.org](http://www.georgiaadoptastream.org)

# Amphibian Monitoring Workshop



## Hands-on education promoting amphibian conservation

Stone Mountain Park, Confederate Hall Historical and Environmental Education Center

May 2009

### Why monitor amphibians?

The two-stage life cycle and permeable skin make amphibians particularly sensitive to environmental disruptions such as drought and pollutants. This sensitivity makes them excellent bioindicators—life forms whose well-being provides clues to the health of an ecosystem. In the 80's scientists began to notice a worldwide decline in amphibian populations. In response, action was taken to begin to study these disappearing creatures. Studies include understanding amphibian populations and life history traits, measuring and monitoring environmental characteristics, and conducting research into potential causes of decline. If you would like to learn more about the amphibian population in Georgia, this workshop is perfect for you.

This hands-on field based educational workshop, led by experienced herpetologists, provides citizens with the tools and training to begin their own monitoring program. This includes information about site selection, creating equipment, animal identification, and data collection.

**Program is FREE. Registration is required.**

For more information, contact Alina Ruiz at 770-498-5629 or [a.ruiz@stonemountainpark.org](mailto:a.ruiz@stonemountainpark.org)



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[http://trc.ucdavis.edu/biosci10v/bis10v/week9/9webimages/SalamanderSpotted\\_4.jpg](http://trc.ucdavis.edu/biosci10v/bis10v/week9/9webimages/SalamanderSpotted_4.jpg)

<http://www.dnr.state.wi.us/org/caer/ce/eek/critter/amphibian/images/toadCalling.jpg>

[http://www.caudata.org/cc/images/species/Plethodon/P\\_glutinosus1GRAZIANO.jpg](http://www.caudata.org/cc/images/species/Plethodon/P_glutinosus1GRAZIANO.jpg)