Seasonal Wetlands

A Landowner Packet

Spring Pools

Robert Frost

These pools that, though in forests, still reflect

The total sky almost without defect,

And like the flowers beside them, chill and shiver,

Will like the flowers beside them soon be gone,

And yet not out by any brook or river,

But up by roots to bring dark foliage on.

The trees that have it in their pent-up buds

To darken nature and be summer woods-

Let them think twice before they use their powers

To blot out and drink up and sweep away

These flowery waters and these watery flowers

From snow that melted only yesterday.







Amphibian Decline



The word "amphibian" is derived from the Greek words "amphi" and "bios," which together mean "two lives."

Become part of the solution to amphibian decline. Create a Certified Wildlife Habitat, protect existing habitat, and participate in a scientific monitoring project such as Nature Quest™

FrogWatch USA.

Frogs, toads and salamanders are all types of amphibians. Amphibians normally hatch from eggs laid in or near water and begin life as aquatic larvae with gills. During adulthood, amphibians live mostly on land, often returning to the water to breed and hibernate.

The Mystery of Amphibian Decline

- Historically, frogs and other amphibians are survivors. They lived through the last two extinction episodes, including the end of dinosaurs.
- At the 1989 First World Congress of Herpetology, scientists made a startling discovery and determined that amphibians were declining and disappearing all over the planet.
- In addition to widespread decline, there has been a high rate of amphibian deformities. Deformed amphibians are not a new phenomenon, but reports were not common until recently. Since 1995, reports have become increasingly common, and a number of scientists are looking for the cause.

What You Can Do to Help Amphibians

• **Protect existing habitat** - Help preserve habitat for frogs and other amphibians in your community by educating others about the importance of protecting existing natural surroundings, such as woodlands and wetlands, and how to keep your watershed healthy. To find your local watershed, visit the Environmental Protection

Inspiring Americans to protect wildlife for our children's future. National Wildlife Federation · 11100 Wildlife Center Drive · Reston, VA 20190 www.nwf.org/gardenforwildlife



Agency's Surf Your Watershed website at **cfpub.epa.gov/surf/locate/index. cfm**.

- Landscape naturally Keep local streams and wetlands healthy. Create a Certified Wildlife Habitat landscape and encourage your neighbors to do the same. Together, your actions and the actions of others can make a difference in the health of your watershed.
- Help scientists Become part of the solution to frog decline. Participate in a scientific monitoring project like National Wildlife Federation's Nature QuestTM FrogwatchUSA program. Data collected by volunteers becomes part of the global pool of information being used to understand why amphibians are disappearing and how we can save them. Visit www.nwf. org/frogwatchUSA for details.
- Create a pond These easy to create water features add wonderful diversity to your yard and provide endless hours of entertainment and educational opportunities for you and your family. Backyard ponds attract beneficial wildlife soon after they are created. Furthermore, balanced backyard ponds rarely attract unusual numbers of mosquitoes. For tips on how to create your own pond, visit www.nwf.org/backyardpond.
- Create or buy a toad abode A toad abode is a small ceramic house for toads. To create one yourself, turn a ceramic flowerpot upside down and, if it does not already have a toad-sized crack or hole in the side for an entrance, prop it up with a rock so the toad can get in and out. It is better not to have a floor in your toad abode because toads like to dig. Place your toad abode in a shady spot near a water source, such as a small pond or even a large saucer of water. For more information on toad abodes visit www.nwf.org/doteontoads.
- Be on the lookout for invasive species Invasive frog species, such as the Cuban treefrog found in Florida, will eat native frogs and compete with them for food. Try to keep them out of your habitat. For additional information about invasive species in your state, visit www.invasivespecies info.gov/unitedstates/state.shtml.



Visit www.nwf.org/gardenforwildlife for more information.

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A Backyard Field Guide: Ephemeral Pools



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Ephemeral Pools

What are they?

Ephemeral pools are seasonal wetlands formed by depressions in the terrain that are filled by rainwater, stream overflow, or groundwater for periods of time extending anywhere from a few months, or even years.

What makes them unique?

Since ephemeral pools are temporary, they are unable to support fish. The absence of fish makes them a safe haven for the development of early larval forms of a variety of species.

What can you find in ephemeral pools?

These pools are filled with all kinds of life. They support the larval stages of several salamanders, frogs, and invertebrates, as well as both larval and aquatic adult phases of newts.

Why should we protect them?

Ephemeral pools have become increasingly susceptible to threats from urban development, deforestation, and ditching. These pools may be small in size, but they are large in life. Their high biodiversity ensures the health of the surrounding woodland. A healthy pool is a healthy forest.



How to Be a Good Explorer

1. **Be prepared.** Bring a net to scoop up leaf litter, where several small organisms may be hiding. To view your discoveries further, bring a bucket or plastic bin and fill it with water. Finally, carry a notebook and pencil to record your findings, sketch pictures, and take down your observations.

2. Wear the right gear. Be prepared to get wet and muddy. This means that rubber boots or old tennis shoes are a good idea.

3. **Keep your field guide handy.** Until you have become practiced, your field guide will be helpful in identifying species found in and around your pool.

4. **Tread lightly.** These pools are home to several small, delicate organisms that can easily be harmed by stomping boots and rough handling so please be careful when exploring the site and handling the organisms.

5. Leave it as you found it. As explorers, we do not want to be disruptive to the environments in which we travel. If you remove an organism, egg mass, or any other object, be sure to return it to the location in which you found it. No organism should be kept or displaced.

6. **Clean your nets and boots** carefully before you enter another wetland. Diseases can be easily transferred from wetland to wetland by equipment



SALAMANDERS

Marbled Salamander

Ambystoma opacum

Range: Eastern United States

Physical Description: As adults they Shaded regions represent range of marbled can reach up to 3-5 inches in size and are easily identified by their smooth wet, skin and black bodies accented with a whitish-grey marbled design running along their back and tail.

Breeding time: Fall/ Early winter. The female will generally stay with her eggs, keeping them moist, until autumn rains fill the pool.

salamanders in NC.

Amphibians and Reptiles of North Carolina - www.HerpsofNC.org



Life Stages: Once the eggs are submerged, they will hatch as gilled larvae that will spend the next 2 to 3 months in the water developing lungs and legs, enabling them to make their first steps onto land and into their new woodland habitat.



SALAMANDERS

Mole Salamander

Ambystoma Talpoideum

Range: Southeastern United States

<u>Physical Description</u>: Adult mole salamanders can reachup to 5 inches in length and are identified by having a gray, black, or brown coloring with an overlying speckling that runs from their backs to their tails.

Breeding: December-March. Females will lay their eggs in the water, attaching her clutch of 200-700 eggs to a submerged twig or stem.

Life Cycle: After they are hatched, the gilled larvae spend anywhere from 60-90 days in the water until they make the transition onto land where they will wait 2 years before reaching sexual maturity and making the journey to their own ephemeral pool.



Shaded regions represent range of mole salamanders in NC.

Amphibians and Reptiles of North Carolina – <u>www.HerpsofNC.org</u>



SALAMANDERS

Spotted Salamander

Ambystoma maculatum

Range: Eastern United States

Physical Description:

Mature spotted salamanders can grow up to 9 inches in length and are easily characterized by the contrast of their dark grey skin to the bright yellow dots that run from their head to their tail.

Breeding: February-March. Females and males mate in the pool followed by females producing

egg masses of up to 300 eggs and anchoring them to leaves or sticks.

<u>Life Cycle:</u> They hatch as gilled larvae, transforming and moving onto land after 4 to 7 weeks of development



Shaded regions represent range of spotted salamanders in NC.

Amphibians and Reptiles of North Carolina – <u>www.HerpsofNC.org</u>





Frogs

Chorus Frog

Pseudacris feriarum



Range: Southeastern United States

<u>Physical Description:</u> Coloring of mature chorus frogs range from brown to green to reddish, varying highly throughout the region. They have a pair of dark stripes that run along the sides of their bodies. Although hard to spot sometimes, they can be heard and identified by their distinct call that sounds much like running fingers over a comb.

<u>Breeding</u>: November – March. Eggs are fertilized eternally as the females lay several clutches on the underside of leaves.

Life Cycle: After hatching, the larvae spend 60-90 days in a tadpole stage during which they will retract their tails and grow arms and legs which will be used to hop out of the pool to begin their adult lives.

Shaded regions represent range of chorus frogs in NC.

Amphibians and Reptiles of North Carolina – <u>www.HerpsofNC.org</u>





Frogs

Spring Peepers

Pseudacris crucifer

Range: Central and Eastern

United States

Physical Description:

Like the chorus frog, spring peepers also vary extensively in coloring. In their mature form they can be yellowish, red, pinkish or tan, but all have the same distinctive X-shaped blotch on their backs. Despite their small sizes they have a loud peeping call that sound like chirps in the night.

<u>Breeding</u>: January – March. The male will externally fertilize the eggs as the females lay individual clutches of up to 900 eggs under leaf litter or other debris.

Life Cycle: After a 6-week long tadpole stage they will progress onto land to live out their terrestrial adult stage.



Shaded regions represent range of spring peepers in NC.

Amphibians and Reptiles of North Carolina – <u>www.HerpsofNC.org</u>





Invertebrates

Caddisfly Larvae

Tricoptera

Range: Throughout the United States

<u>Physical description:</u> Resembling a caterpillar, caddisfly larvae are cylindrical and have thin extended gills. They are mostly found inside their cone shaped cases made from stones/pebbles, sand, leaves or sticks.

<u>Breeding</u>: Females will lay eggs on the edge of the waterline or will slightly submerge themselves.

Life Cycle: The larvae go through 4 stages, having to shed and rebuild their case at each stage as they grow. Once those stages are complete they will transform into their moth-like adult forms and leave the pool.







Invertebrates

Fairy Shrimp Anostraca

<u>Range:</u> Throughout the United States

<u>Physical Description:</u> At around one-half inch, fairy shrimp have 11 pairs of legs and are usually a white or reddish color. They are distinguished by their technique of swimming upside down.

<u>Breeding:</u> Males externally fertilize an egg sack carried by the female after several days of swimming attached to the female. The female will then fall to the bottom of the pool still attached to the egg sack and die. The clutches can reach up to 150 eggs.

<u>Life Cycle:</u> Once the eggs hatch, the larvae will develop and live out its lifespan in the pool where it will eventually breed and produce its own offspring.





Marbled Salamander North Carolina State Salamander

Marbled Salamanders

Ambystoma opacum

Marbled Salamanders are amphibians found throughout most of the eastern United States in damp woodlands. As adults they can reach up to 3-5 inches in size and are easily identified by their smooth, wet, skin and black bodies accented with a whitish-grey marbled design running along their back and tail.

The Secret Life of Salamanders

As amphibians, marbled salamanders live a "double life"; half in water and half on land. In the fall, salamanders travel to seasonal wetlands, or vernal pools, to mate and lay eggs in burrows dug in the soft ground (a). The female will generally stay with her eggs, keeping them moist, until autumn rains fill the pool. Once the eggs are submerged, they will hatch as gilled larvae (b) who will spend the next 2 to 3 months in the water developing lungs and legs, enabling them to make their first steps onto land and into their new woodland habitat



A Habitat in Trouble

Seasonal wetlands are formed by depressions in the landscape filled by rainfall, stream overflow, or underground springs, creating pools that can hold water anywhere from a few weeks to a few years before drying up.

Salamanders depend heavily on these pools for breeding purposes. They not only provide their young with the aquatic environment necessary for development, but the temporary nature of the habitat also prevents the establishment of predator fish populations, which are a threat to both salamander adults and their young, making these pools an ideal breeding spot.

Unfortunately due to increased development, ditching, and deforestation, many of these wetlands have been filled in or destroyed and the surrounding woodland degraded, reducing both the adult and juvenile salamander populations.

What Can You Do?

- If you have a seasonal wetland on your property:
- Maintain the wetland and surrounding wood land by eliminating invasive species.
- Put out tin or wooden boards for additional covering for salamanders.
- Share any amphibian findings with neighbors, especially children, and teach friends and family about the importance of these habitats.
- Report salamander findings on the Carolina Herp Atlas. http://www.carolinaherpatlas.org/

How can I protect this habitat?

The main threats to this habitat, and the species that depend on it, are:

- Physical destruction These habitats are small and vulnerable. Disturbance to the area can easily disrupt the ecosystem. One thing to note is that the wetland itself is not the only important area; many of the species that use the wetland live in the surrounding forest for most of the year. (See figure below.)
- Altering the water flow Ditching and damming are common threats to these habitats, where water is diverted from its normal path and can't fill the wetland for the wet phase.
- Chemical pollution Fertilizer runoff and insecticides are examples of pollution that often threatens these wetlands.
- Introduction of new species The addition of new species, especially fish but even some plants, can drastically alter these ecosystems.

By avoiding these threats and encouraging a natural, unaltered habitat, you will be protecting the Seasonal Wetland ecosystem, the greater woodland ecosystem within which it resides, and the many species that depend on it.



"Hope and the future for me are not in lawns and cultivated fields, not in towns and cities, but in the impervious and quaking swamps." -Henry David Thoreau's *Walking*



For More Information on Seasonal Wetlands:

- Vernal Pools: Natural History and Conservation, by Elizabeth A. Colburn
- Partners in Amphibian and Reptile Conservation - Wetland Conservation (http://www.parcplace.org/resources/1 87-wetland-conservation.html)
- NC Wildlife Resources Commission Small Wetland Communities (http://www.ncwildlife.org/Portals/0/Co nserving/documents/Coast/CP_Small_w etland_communities.pdf)
- Massachusetts Office of Energy and Environmental Affairs - Vernal Pools
- (http://www.mass.gov/eea/agencies/df g/dfw/natural-heritage/vernal-pools/)

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Photography by Ashley LaVere, Jeff Beane, and Dennis Burnette





Puddles of Possibilities



So, I have a Seasonal Wetland....now what?

What is a Seasonal Wetland?

Seasonal Wetlands, also known as ephemeral pools, vernal pools, or upland pools, are unique habitats that form during heavy rains or snowmelt. These areas are either dry or fairly shallow for most of the year, but temporarily become ideal habitat for many species of animals and plants. The wet phase of the habitat could last for months or years, and may occur yearly or every few years. Most common cycles, however, include the area being wet during the winter and spring months and then drying by mid-summer.

The fact that these wetlands are seasonal, and experience a cycle of wet and dry phases, means that you could have one and not even realize it! Below is a checklist to determine whether the area on your land is a seasonal wetland.



Does this sound like your land?

- ✓ Temporary Dries up during part of the year or every few years.
- ✓ Absence of fish These habitats cannot support fish due to the seasonal drying.
- ✓ No flow no continuous flow of surface water through the system.
- ✓ Wetland plants the presence of plants known to grow in wet areas
- ✓ Indicator species the presence of certain animals that only breed in these habitats, such as the Marbled Salamander (*Ambystoma opacum*) shown above.
- ✓ Water-stained leaves and tree trunks noticeable even during the dry phase.



Why are they Special?

Seasonal Wetlands support a wide range of plants and animals, such as Jack-in-the-pulpits, marsh ferns, salamanders, frogs, and invertebrates. The fact that fish cannot survive in these habitats makes them essential breeding habitat, especially for amphibians. Amphibians have a two-stage life cycle, with eggs laid in or near water hatching into an aquatic juvenile before changing into the terrestrial adult. Amphibian eggs have no "shell" and are particularly at risk to predators, as are the tiny young (shown above). Seasonal wetlands form nurseries for these fascinating and vulnerable animals.

Why do people want to study them?

Many amphibians, especially salamanders, are difficult to find. Adult salamanders generally spend the majority of their time in underground burrows, making them difficult to observe and study. Seasonal wetland habitats offer a rare opportunity to see these animals as they come out to breed, allowing us to count and study them. Amphibians have very sensitive, porous skin that is highly susceptible to pollution, making them important indicators of the health of the local environment. This makes it critical to know how these amphibian populations are doing. "Seasonal Wetlands are extraordinary habitats that people are beginning to take note of."

How does this affect me?

Having a Seasonal Wetland on your property is very special. It not only allows you to observe and appreciate animals that many people never get to see, it also gives you the chance to share these experiences with family and friends. Having this habitat on your land does *not* mean that your property can be taken away from you.



What are the possible benefits for me?

House Bill 1889 Wildlife Land Property Tax Changes (last updated in 2008)

Seasonal Wetlands are extraordinary habitats that people are beginning to take note of. In 2007, a bill was passed in North Carolina to provide a property tax relief for certain qualifying lands. Land of greater than 20 consecutive acres that is proven to protect priority animal species or wildlife habitat could qualify for tax relief under this bill after assessment.

For more information, go to www.ncleg.net and search "House Bill 1889".