The Secret Pool

By Dan Burnett, Penitentiary Glen Nature Center Manager

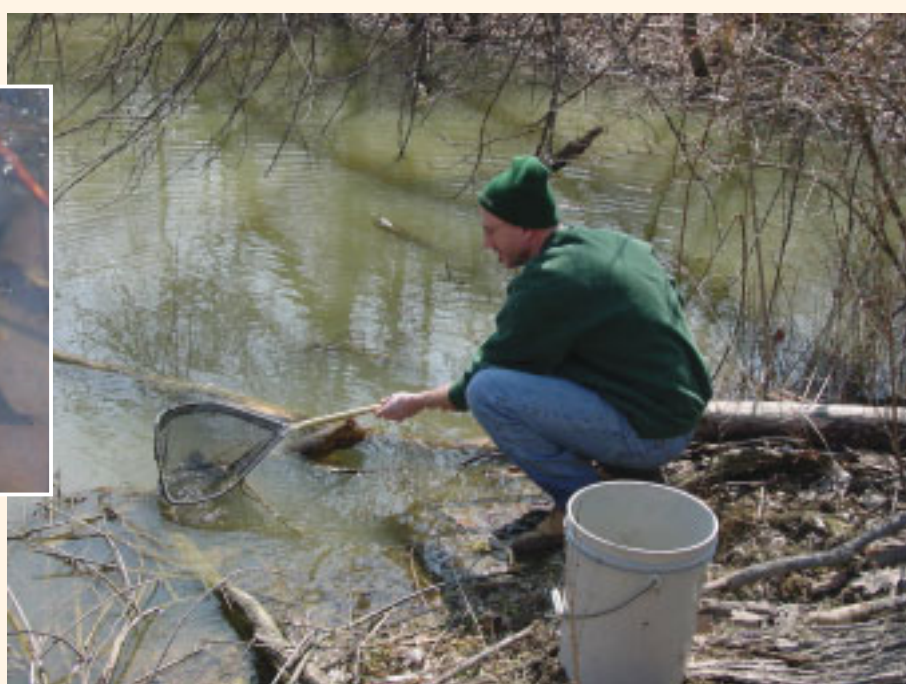
Imagine a world where you are so dependent on your environment that rain arriving one day too late or a chance encounter with a water scorpion means the difference between life and death. And so goes life in a vernal pool. These small, but very dynamic wetlands blossom with life every spring. The organisms that inhabit them compete with each other in a daily struggle for food and space, all in a race against dryness.

> Vernal pools derive their name from Latin "vernus," meaning "belonging to spring."

Vernal pools, also know as ephemeral pools, autumn pools, spring ponds or woodland ponds, temporarily fill with water in autumn or winter due to rising ground water, melting snow or rainfall and usually dry up by late summer. Amphibians and invertebrates (such as insects) living in vernal pools rely on breeding habitat that is free of fish predators. Occasional drying prevents fish from establishing permanent populations in these pools. Although these depressions may not look like important habitat, they are vital to the life cycle of many salamander, frog and insect species that get a relatively predator-free start in life. A vernal pool is a productive hatchery for terrestrial amphibians. During its short period of intense growth, the nutrients and energy of fallen leaves on the pool bottom cycle into the frogs and salamanders of the adjacent woodlands. Most people, even the avid woodsman, rarely encounter any of these secretive creatures. On rainy spring nights, hundreds of them make the migration trek to the pool to breed and within a few short days return to disappear into the woodlands, living out their 20 years of life within a few hundred feet of the pool.

Some animals have evolved to be completely dependent on these temporary pools for part of their life cycle. These are known as "indicator" vernal pool species. If the indicator species are in the wetland, then it is in fact a vernal pool.

- **Fairy shrimp** are tiny crustaceans that spend their entire lives (a few weeks) in a vernal pool. Eggs hatch in late winter/early spring and adults may be observed in pools in the spring. Females eventually drop an egg case that remains on the pool bottom after the pool dries. The eggs pass through a cycle of drying and freezing and hatch a year later when water returns.
- **Wood frogs** are an amphibian species of the woodlands. They venture to vernal pools in early spring, lay their eggs, and return to the moist woodland for the remainder of the year. Tadpoles develop in the



Dan Burnett collects spotted salamander eggs from a nearby site to "seed" the new pool the following spring. Naturalists were pleased to observe that local salamanders had also found their own way to the new pool.

pool, emerge and eventually join adults in the adjacent woodlands.

- **Mole salamanders** (such as the spotted and Jefferson salamanders) spend most of their lives in burrows on the forest floor. Annually, on certain rainy spring nights, they migrate to ancestral vernal pools to mate and lay their eggs. They soon return to the woodlands. The eggs develop in the pool and, by the time the pool dries, the young emerge to begin their life in the surrounding woodlands.

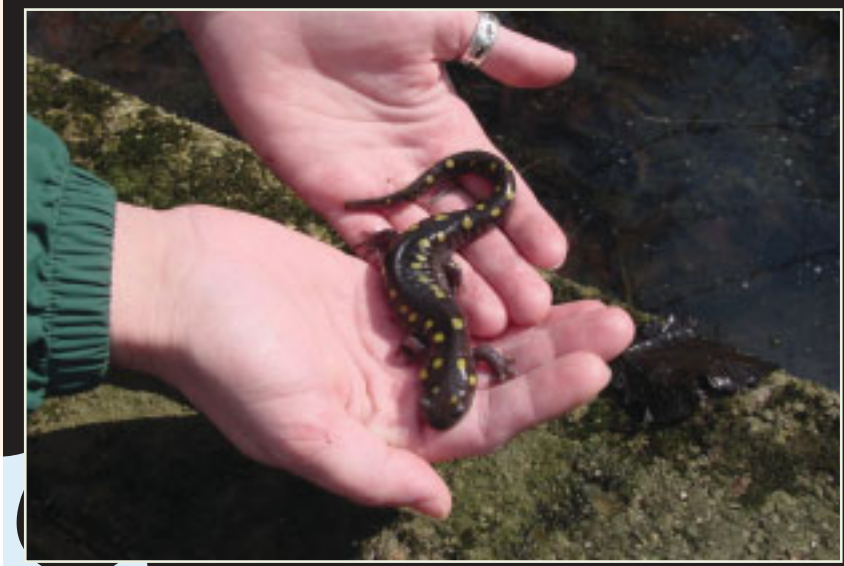
Over 80 vernal pools have been documented within the Lake Metroparks system. Many of these pools are naturally occurring, however, Lake Metroparks Natural Resources staff created some. The newest is at Penitentiary Glen Reservation.

Why do we create vernal pools? By creating vernal pools, we help preserve the rich biodiversity of our woodlands. Vernal pools are an important food resource for the entire forest. Ohio has lost over 90% of its original wetlands over the past 200 years. Many vernal pools have simply been plowed under or turned into fishing ponds.

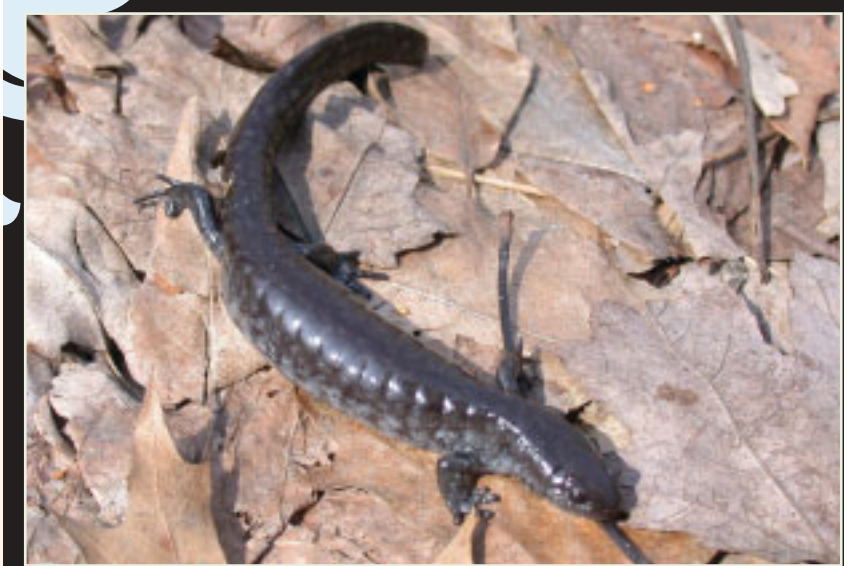
Vernal pools are essential habitat for portions of the life cycles of many species. They are a virtual hot bed of activity within the food chain. Forest leaves dropping into the pool in fall are decayed by bacteria and fungi, which in turn become food for larger zooplankton. A variety of insect larva feed on the shredded leaves and zooplankton. Other insects such as water boatmen feed on the leaves and smaller organisms. Upon hatching, frog tadpoles feed upon the leaves and algae in the pool. This fuels the growth of developing forms of predaceous beetles that in turn may be eaten by turtles and snakes. An owl or raccoon may consume the larger invertebrates. Vernal pools may provide a refreshing drink for a deer on a hot summer day or serve as an overland link for reptiles and amphibians as they travel from wetland to wetland. By the time the pool dries, the nutrients from the fallen leaves have cycled up through the food chain and returned to the forest.

Vernal pools are also great sites for naturalists and budding young scientists to experience nature. With one swoop of a dip net, the fascinating stories and secret lives of a host of creatures can be discovered!

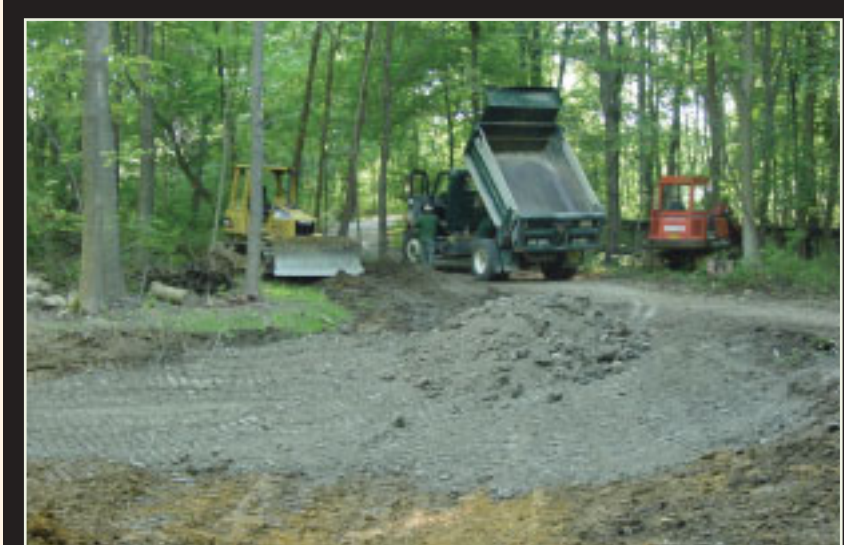
Marvel at life... visit a vernal pool!



Spotted salamander



Jefferson salamander



Lake Metroparks' newest vernal pool was created at Penitentiary Glen Reservation in fall 2005. A clay liner was added to prolong the pool into summer.