

## VERNAL POOLS

*In nature, size isn't everything. Vernal pools are small ecological gems of greater significance than their size would suggest. Learning more about these modest pools transforms them in our thinking from "big puddles" into critical wildlife habitat.*

### WHAT IS A VERNAL POOL?

Vernal pools are small, shallow, temporary wetlands that occur in or next to forests or wooded areas and lie in isolated basins with no inlets or outlets. The pools fill in the spring, dry down in the summer, may fill again in the fall and, as a result, lack fish populations.

### HOW TO IDENTIFY A VERNAL POOL:

Vernal pools change appearance seasonally and sometimes yearly (see front). They are most evident in early spring when the "big puddles" have filled with snowmelt. In wet years, water may flow over a filled pool, but after that, the pool will be isolated from other water sources. Once the breeding season begins in early spring, your ears should lead you to the pool. In summer, when the pools are dry, the clearest indication of a vernal pool may be dirt-covered, matted leaves in a shaded shallow depression that has little vegetation in its center. Pools often refill with autumn rains and freeze in winter. In fact, winter is a good time to scout promising locations for small frozen pools to pinpoint the best places to visit in late March and April.

## PROTECTING VERNAL POOLS WHAT CAN WE DO?

One of the biggest challenges is learning to recognize what vernal pools look like throughout the year. Their drastic change in appearance may be one reason so many of our vernal pools have been filled in or covered and destroyed. Vernal pools are very vulnerable to activities that alter water flows, disturb the bottom of the pools, or significantly alter the surrounding forest. Loss of vernal pools is a particularly nettlesome problem because restoring them in their original location is difficult and because certain amphibians always seek the specific pool from which they emerged. Destroying pools may make it difficult for amphibians to reach another pool.

According to a recent study in Vermont a zone within 410 yards of a vernal pool's edge can be considered the pool's "life zone" because 95 percent of a pool's salamander population resides within that distance, traveling to and from the pool. Road construction, development, logging and other such activities can affect vernal pool ecology by interfering with amphibian migration to and from breeding habitat, the ability of the basin to retain water, the amount of shade over the pool, and the influx of leaf fall and woody debris from surrounding vegetation. In order to protect the ecology of a vernal pool, it is recommended that no soil disruption or tree cutting occur within 50 feet of the edge of the pool and that only well considered activity occur within 500 feet of the edge.

## CONSERVATION NOTES VERNAL POOLS



Photos: Leo P. Kenney

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## WHAT'S SO SPECIAL ABOUT VERNAL POOLS?

Wetlands without fish are uncommon. So, in vernal pools, amphibians can breed without fish feeding on their eggs or their developing larvae. Despite being small, vernal pools contain a wealth of microscopic organisms that consume the decaying leaves collected in the pools each autumn. These organisms are food for small species, such as fairy shrimp, fingernail clams, snails, and insect larvae, which become food for other forest animals including snakes, turtles, birds, and small mammals.

The biodiversity of vernal pools is particularly impressive – more than 550 species are found in some Northeastern vernal pools – with many species restricted exclusively to these habitats. Vernal pool amphibians exert an important influence on the ecology of the surrounding forest up to one-quarter mile from the edge of the pool. Over an entire season at one site, the weight of vernal pool breeding amphibians was found to exceed that of all breeding birds and small mammals in the surrounding 50-acre upland forest.

A worldwide decline in amphibian populations has been documented in the last decade; these losses underscore the critical need for protection of vernal pools.

## SPECIES FOUND IN VERNAL POOLS

**Mole salamanders** are elusive except during the early spring migration and courtship, but their many egg masses will be evident in vernal pools. Except for the 2-3 weeks spent migrating and courting, spotted salamanders, the uncommon blue-spotted, and the rare Jefferson lead underground lives in deep burrows within a few hundred feet of their pool. It may take a migrating salamander as long as 2 weeks to reach its breeding pool. Spotted salamanders may live for 18 years; they don't reproduce until their 5<sup>th</sup> year.

**Wood frogs** emerge early. Their loud duck-like quacking chorus will lead you to the pool. They become quiet if disturbed, but if you remain still, they will resume calling. Most (80-90 percent) of wood frogs breed in the vernal pool where they developed; once they begin breeding, they return every year to the same pool.

**Fairy shrimp**, best seen with close range binoculars, live only in vernal pools and are active before the amphibian migration. When their pool dries up, the adults die, but the resting eggs (encysted embryos) survive heat, drying out, freezing, and being eaten by other animals to emerge with the next year's spring floods. In fact, the eggs must dry and be re-submerged to hatch.

## DISCOVER AND EXPLORE VERNAL POOLS

The best way to learn about vernal pools is by making a springtime visit. A daytime visit is fine (and easiest), but to catch the amphibian migration, you'll need to head out after dark on the first warm rainy nights when air temperatures are above 40° F. Wear raingear, walk carefully, and bring a flashlight but not a dog. You're likely to encounter the pool teeming with life. Try to identify the species whose survival depends on vernal pools: the spotted, blue-spotted, and Jefferson salamanders, wood frogs, fairy shrimp, and fingernail clams.



SPOTTED SALAMANDER  
6-8 INCHES LONG

### VERNAL POOL WEB SITES:

[www.vtfishandwildlife.com/cwp\\_elem\\_comm\\_vp.cfm](http://www.vtfishandwildlife.com/cwp_elem_comm_vp.cfm)

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