

We Should Protect Vulnerable Vernal Pools

by David Gibson



A Spotted Salamander near Ski Tow Road, Tupper Lake, en route to a vernal pool. Photo © David Gibson

Wander into a wood with your ears open in early spring and you are likely to quizzically turn your head to try and locate an indistinct sound, far off but not too far off, remarkable but subtle, an undertone of – castanets? That’s how we described the sound 29 years ago when as new homeowners we explored our forest and discovered the breeding quacks of the wood frog.

I learned by wandering that wood frogs bred in the hundreds, not just in that one forest pond (a vernal pool), but in several others hundreds of yards apart – but not in every pool, just in some. Twenty-nine years later, they continue to breed just in those same pools between March 15 (the earliest date I’ve recorded their sounds) and April 15 (the latest), depending on temperature.

I discovered that the female wood frog is the larger, the smaller males competing to mount her, bumping into each other in the process and together a joined male and female sink to the bottom of the pool in a blissful state of affairs.

A week or less later, the sounds of breeding males had vanished for another year, while their egg masses are attached to wetland shrubs near the deepest section of the pool. I learned that those breeding ponds completely dried up by July, leaving a dank, dark layer of red maple leaves, and I joyfully discover a young froglet or two or three – no, dozens – dispersing out into the forest from their natal pool. The pooled waters lasted long enough, just enough, to nurture another generation of wood frogs.

To summarize, Vernal Pools are: 1. Within or adjacent to a woodland; 2. Small and shallow; 3. Ephemeral, meaning they fill up in spring snowmelt and rain and dry up in summer; 4. Isolated from flowing water; 5. Lack predatory fish populations, key to the success of reproducing frogs, salamanders.

What are the ecological values of vernal pools? Just to begin with, many amphibians depend upon them to breed, and just a single species of salamander (*Plethodon cinereus*) comprises more biomass in our northeastern forest than any other vertebrate. Salamanders and frogs are critical to the ecological functioning of northeastern forests. As conservation biologist and herpetologist Dr. Michael Klemens testified at the Adirondack Club and Resort public hearing in Ray Brook, wood frogs and salamanders are critical for proper energy transport out of vernal pools and into the adjoining forest. “For their small size, they pack an ecological wallop,” he said.

Good, readable books about vernal pools includes *Vernal Pools: Natural History and Conservation* by Elizabeth A. Colburn (2004).

Living as I do in one of the fastest growing counties in the country (Saratoga), I also discovered that there is little protection from subdivision and development afforded these ephemeral ponds we know as vernal pools, and afforded to the specialized critters dependent on them – from migrating wood ducks, and wood frogs, salamanders, to bugs like water boatmen, and fairy shrimp at the bottom of the food chain.

In fact, in the photos taken just this week you can make out heavy earth moving equipment beyond the vernal pool, the future access road cul-de-sac before the houses get built in a 16-lot subdivision. Neighbors like us had tried our best to limit and redesign this damaging subdivision, citing the town’s failure to conduct an environmental impact assessment. All we got was an unenforceable 50-foot buffer around the larger of the vernal pools.



A vernal pool full of chorusing wood frogs with earth moving machinery and silt fence fifty feet beyond. Photo © Dave Gibson

Why is recognition and protection of vernal pools difficult? Primarily because our species tends to care more about big fish, birds and mammals, and less about the small stuff, like the salamanders that form the critical foundations for the wildlife and larger ecosystems we do care about. Secondly, because of the small size of vernal pools, usually less than an acre, often 1/10-1/50th of an acre, they often escape New York's wetland protection laws.

While the Adirondack Park Agency (APA) regulates activities in all wetlands regardless of size, NYS Department of Conservation (DEC) regulations only begin at 12.4-acres, or 2.5 hectares in size. The federal Army Corps of Engineers (which is involved through the federal Clean Water Act) states that such small pools must be connected to a federal waterway, like the Hudson River, to merit their regulatory attention. After we unsuccessfully sued a town for permitting this subdivision in a forest full of "isolated" vernal pools without doing any biological assessment, the Army Corps refused to get involved – the pools were not physically "connected" to the Hudson River drainage, we were told.

In the Adirondacks, vernal pools for breeding salamanders and frogs may be isolated ponds, or they may be embedded within larger wetlands which fall under the regulatory jurisdiction of the Adirondack Park Agency. However, even the APA may not appreciate the fact that spotted salamanders and wood frogs must move out of those pools after breeding to upland forests to feed and find shelter the rest of the year.

In spring, 2011 Adirondack Wild hired the aforementioned Dr. Michael Klemens who in just one rainy night discovered 11 species of amphibians crossing Ski Tow Road in Tupper Lake to breed in vernal pools above Cranberry Pond. The problems for these amphibians from the ACR development are multi-fold. When built, the Adirondack Club and Resort housing subdivisions, and associated driveways, curbs and lawns on either side of Ski Town Road would isolate the vernal pools from the forested uplands, cutting off the migratory pathways; secondly, the more roads, driveways and curbs, the more cars, and the more lethal the environment for migrating, soft-bodied salamanders and frogs.

Then, of course, there are the impacts of runoff from housing subdivisions, and manipulation by their human occupants on the vernal pools themselves, which can radically alter the pool's hydrology, depth, temperature and chemistry – upsetting the delicate balance of these temporary pools. Keep in mind, it is the very fact that these pools eventually dry up that makes them fish-free, and good amphibian habitat.

Dr. Klemens, Adirondack Wild's expert witness at the ACR hearing, testified that the ACR design "completely ignores the interdependency between wetlands and surrounding uplands that most wildlife requires. For example, many amphibians move up to 1,000 feet or more from their natal wetlands into the surrounding uplands. What sense is there in protecting the wetlands where these amphibians return to breed one month each year, while destroying the upland habitat used for foraging and hibernating for the remaining eleven months of the year? How could such an approach be considered protective of the delicate physical and biological resources of the site?" (From his pre-hearing written testimony, April, 2011).

Dr. Klemens advised the hearing that vernal pools receive a fully protective 100 foot buffer around their edges, with only limited development out to approximately 750 feet in order to conserve their migratory routes, summer and overwintering areas. Dr. Klemens' testimony influenced APA staff, especially Dan Spada, who came forward later in the ACR hearing with recommended 750-foot buffers from development around wetlands with embedded vernal pools. Asked whether these were APA standards or regulations, he replied no (APA wetland buffers are 100 feet), but that in his professional opinion he agreed with Dr. Klemens that such buffers were justified as critical habitat for amphibians.



A breeding male wood frog. Photo © Dave Gibson

These buffers were not included in the final ACR permit issued by APA, but a “comprehensive” amphibian survey on some of the Resource Management land impacted by ACR (not in the other land use classification, Moderate Intensity Use, in which there is also critical amphibian habitat) is required to be performed by the developer as a permit condition. Under the permit conditions, I think the survey is supposed to be completed by this summer. I’m not holding my breath.

Naturally, Dr. Klemens and Adirondack Wild argued that this and all wildlife surveys should have been conducted years before so that the hearing could evaluate the quality of the survey, not argue about its non-existence. In six years of prehearing review, ACR developers had not looked for, and therefore never found a single species of amphibian living on the 6,200-acres. Dr. Klemens found eleven species in one night’s search on a small section of the site.

What can be done? As Dr. Klemens repeatedly advised regarding the ACR hearing, environmental site review should automatically conduct an inventory of vernal pools over 1-2 field seasons, and map those sites in advance. Such maps should become part of any assessment of potential adverse environmental impacts. Any town in NYS can consider their own vernal pool protective ordinances, which begins with an inventory of such habitats. The Adirondack Park Agency could definitely beef up its vernal pool recognition and protection through regulation out to 750 feet from the pool edge, as it could with a variety of other sensitive wildlife habitats throughout the park. Standardizing a requirement for comprehensive wildlife surveys to be completed before any major project application is deemed complete under the APA Act would be a great way for the APA to begin.

Also, efforts to reform New York's Freshwater Wetlands Act in the State Legislature should be stepped up so that vernal pools receive definition, recognition and some statewide protection. The NYS DEC website contains a nice graphic and description of the value of vernal pools, but then states, incorrectly, that "due to their small size, woodland pools are usually not afforded protection by state and federal wetland regulations, and are often missed during land-use planning reviews." Neighboring Massachusetts and Connecticut have taken important steps in law and regulation to recognize and protect vernal pools, as have many municipalities. So should New York State.

You can learn more about vernal pools in the Adirondacks from Stacy McNulty, Associate Director and Research Associate at SUNY ESF's Adirondack Ecological Center in Newcomb [here](#).

Photos: Above, a Spotted Salamander near Ski Tow Road, Tupper Lake, en route to a vernal pool; middle, a vernal pool full of chorusing wood frogs with earth moving machinery and silt fence fifty feet beyond; and below, a breeding male wood frog.