The Habitat

A newsletter of the Connecticut Association of Conservation & Inland Wetlands Commissions, Inc.

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CACIWC

The CAWS Vernal Pool Monitoring Program

by Edward M. Pawlak, MS, Certified Professional Wetland Scientist (PWS), Registered Soil Scientist

Vernal pools are among the most unique wetland habitats in Connecticut. Unlike permanent ponds and lakes, vernal pools are temporary waterbodies that dry out most years by mid to late summer, which excludes permanent predatory finfish populations. Over the millennia a suite of amphibians ("obligates") has adapted to and exploited this unusual alternating wet-dry hydrology, to the point that they cannot successfully breed and develop in any other wetland or aquatic habitat. Three of these amphibians are listed in the DEEP Natural Diversity Database, and three others are labeled as Species of Greatest Conservation Need in the 2015 DEEP Wildlife Action Plan (*Figure 1, page 12*).

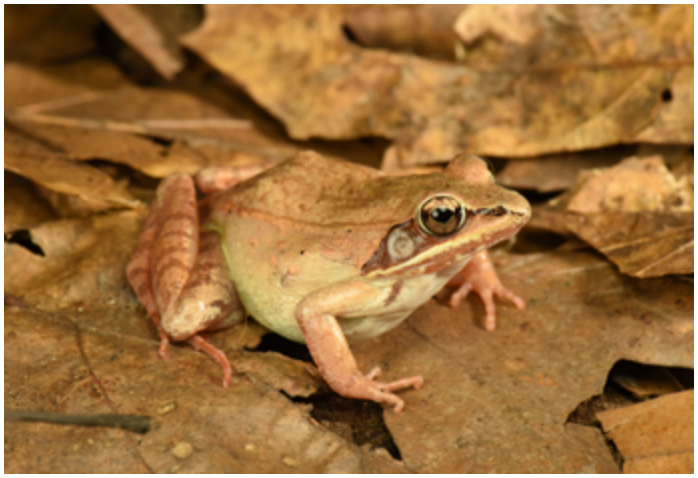
There are a number of reasons why these obligate amphibians are faring so poorly in Connecticut and beyond. Vernal pools are very difficult to identify on the landscape during their dry phase, so it is possible that they will not be recognized or protected during the permit review process. Additionally, the adult obligate amphibians only spend a few weeks in the pools to breed and lay eggs. They spend the majority of their lives in upland and wetland habitats on the surrounding landscape, sometimes many hundreds of feet from their breeding pools. Thus, in order to survive, they require the conservation of their breeding pools and these non-breeding habitats, which often are very large. A 2003 landmark State Supreme Court decision (Avalon Bay) significantly weakened the jurisdiction of wetland commissions over activities beyond the limits of wetland and watercourses. Since that decision it has been very challenging for commissions to protect and conserve non-breeding habitats of obligate vernal pool amphibians, leading to their further decline.

CAWS monitoring program, continued on page 12

Vernal Pools: Fact, Fiction and Fantasy

by Michael W. Klemens, PhD, Associate in Herpetology, American Museum of Natural History

In the late 1980s vernal pools, a hitherto poorly understood and little appreciated type of wetland, began to gain recognition as a complex wetland ecosystem which conjoined small wetlands with their surrounding upland (i.e., non-wetland) habitat. While the relationship between wetlands and watercourses to their surrounding upland habitats was understood



Wood frog (Rana sylvatica). Photo by Dennis P. Quinn

as providing a buffer for water quality, the ecological requirements of vernal pool breeding amphibians carried the wetland "on their backs" hundreds of feet beyond the conventional water-quality buffers. Not surprisingly, this led to a series of legal challenges that sought to establish the jurisdictional limits of a wetlands agency in conserving these unique resources. Issues that were litigated included whether the upland habitat of a vernal pool that occurred on an adjacent parcel fell within the purview of an inland wetlands agency (AvalonBay in Wilton), the need for substantial evidence of impact opposed to speculation (Riverbend in Simsbury), and culminating in 2010 with the codification that wood frogs (a vernal-pool breeding

vernal pools, continued on page 4

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CACIWC News

As we worked to complete this issue of *The Habitat,* we thought back to the dedicated group of legislators who developed the original **Connecticut Inland Wetlands and Watercourses Act (IWWA)** fifty years ago this month, which was approved by the Connecticut General Assembly in May 1972. It is hard to imagine that 50 years have passed since the passage of this important enabling legislation!

While we all continue to struggle to complete our work during the ongoing COVID-19 pandemic, we hope to take the time to highlight your town's many decades of service as part of our **IWWA 50th Anniversary Celebration**! We are requesting stories and photos of the early years of wetlands protection by both your town's inland wetlands and conservation commissions. Please watch our website for periodic 50th anniversary celebration updates.

As part of our year-long anniversary celebration, we will also be examining progress in wetlands and watercourse protection along with changes in Connecticut wetlands law through conference workshops and articles in upcoming issues of *The Habitat*.

This issue contains two articles on **vernal pools**, appropriate for our Spring issue. The first, a summary of the Connecticut Association of Wetlands Scientists (CAWS) vernal pool monitoring program by Edward Pawlak, based on his presentation at our Mid-Year Conference. This monitoring program provided data that highlights both the value of these unique habitats and the impact of development on their ability to support key amphibian species.

The second article by Dr. Michael Klemens, provides a frank discussion on why commissions should require good, seasonally appropriate, amphibian population data when evaluating applications for development that may impact these habitats. Data should first be collected to evaluate these pools to determine their true biological value and, if valuable vernal pools are identified, help guide

CACIWC news, continued on page 15

In This Issue

Journey to the Legal Horizon

by Attorney Janet Brooks

Part I: Thinking Back on the First 50 Years of the Inland Wetlands & Watercourses Act

This year we can commemorate the fiftieth anniversary of the enactment of the Inland Wetlands and Watercourses Act by both looking back on five decades of experience and forward. I will look back at the first decade or so in this column. The Act did not require wetlands permits as of a certain date. Rather some time passed in enacting municipal ordinances to establish wetlands agencies, in appointing members and thereafter promulgating the municipal wetlands regulations. The requirement for a permit for regulated activities was triggered once the municipal wetlands regulations were adopted, resulting in a roll-out of the Act throughout the state. The basic components of the skeleton of the Act are evident in Supreme Court case law by 1984, even if the flesh on the skeleton will take on a different appearance over time.

Let's start with the need for expert opinion on matters of pollution control. Our Supreme Court ruled in its first case on this topic clearly and unequivocally in 1980: "[A] lay commission acts without substantial evidence, and arbitrarily, when it relies on its own knowledge and experience concerning technically complex issues such as pollution control, in disregard of contrary expert testimony, without affording a timely opportunity for rebuttal of its point of view."[1]

That should sound familiar – it remains the current law. Voting to deny a permit for a septic system, one commission member, without relying on an expert or disclosing expertise from commission members, spoke of "an extreme possibility of septic failure."[2] The court set forth the procedure the agency should have utilized: if the commission wants to rely on the expertise of its own members, it needs to timely disclose that expertise and opinion, so that the applicant has an opportunity to rebut the opinion. The Appellate Court relied on that Supreme Court decision almost a decade later (1988) reversing an agency decision that ignored the four experts who stated the application would have no adverse impact on the wetlands. The court stated that the wetlands agency members could not rely on "their own insight."[3] An agency was not required to believe any expert, but neither could it rely on its own unsupported beliefs. Another fundamental issue, whether activities conducted outside of wetlands/watercourses are encompassed in the definition of "regulated activity", arose early in the case law. The Supreme Court in *Aaron* (1981) dealt deftly with an applicant who went directly to court complaining it shouldn't be required to get a permit for a septic system located 50 feet from the wetlands boundary. Relying on a University of Connecticut law professor's treatise, the Court held: " 'Obviously, one can 'cause' pollution (or many of the other regulated activities) of a wetlands by actions on parcels adjacent to and perhaps even remote from

legal, continued on page 16

vernal pools, continued from page 1

species) had a direct beneficial effect on the water quality of a wetland (Riversound in Old Saybrook).

For those of us who had been studying these complex wetlands for decades, it was mind- boggling that almost overnight vernal pools developed a cult-like following among sectors of the public. Well-intentioned people were moving salamanders across roads, coining a lexicon that included "Big Night" signifying the first major springtime nocturnal migrations of amphibians to the pools, or renaming vernal pools as "Wicked Big Puddles." My first book on Connecticut's amphibians and reptiles and was nearing completion and I was in the midst of a study with James Bogart of the University of Guelph (Canada) on the hybrids and genetic interactions between Jefferson and blue-spotted salamanders. Nocturnal visits to study areas were becoming increasingly crowded with people all wanting to observe firsthand the explosive reproductive activity of hundreds of amphibians crowding into small vernal pools. After one particularly difficult night of sampling, when prior observers had trampled through the shallows of the pools, one of my students asked me what I thought about this movement of pool watchers, who some referred to as vernal pool groupies. I could easily have expounded on the value of having people become aware of these resources and how that would ultimately aid conservation, but the turbid waters of the pool we had just left, and the detached damaged egg masses floating around were still fresh in my mind. In a moment of witty weakness, co-opting a line from a then popular country-western hit song, I retorted with irritation that "I was [into] vernal pools before vernal pools were cool." Subsequently, new data have shown that people casually moving between wetlands has led to the spread of amphibian diseases from pool to pool, spread by boots, dip nets, and minnow traps.

Female spotted salamander (Ambystoma maculatum) laying eggs. This species lays both clear and opaque egg masses. Spotted salamanders are distributed Statewide. Photo by Dennis P. Quinn

In 2005, well more than a decade after that night, noted land-use attorney and planner Dwight Merriam discussed the regulatory and land-use challenges presented by vernal pools, a type of ecosystem that was beginning to be widely recognized as presenting unique conservation and regulatory challenges. Merriam, in his book *The Complete Guide to Zoning*, [1] observed:

"If your wetlands expert tells you that you have a 'vernal pool,' sit up and pay attention! A vernal pool is a special type of wetland system that supports certain types of species not found in any other habitat, such as wood frogs, fairy shrimp, and salamanders. These pools are vernal in that they emerge in the springtime, have standing water in them until the early summer, and then dry up. As a consequence, these pools cannot support fish, and the fish are not there to eat the eggs of the salamanders and other species that thrive in these environments.

Vernal pools do not necessarily contain endangered species, but these pools are an uncommon type of wetland system, and their preservation has become increasingly important. Furthermore, to protect a vernal pool habitat, it is often necessary to protect large areas of upland, perhaps a buffer of as much as 300 to 500 feet for three-quarters of the way or more around the vernal pool. We have even seen instances

vernal pools, continued on page 6

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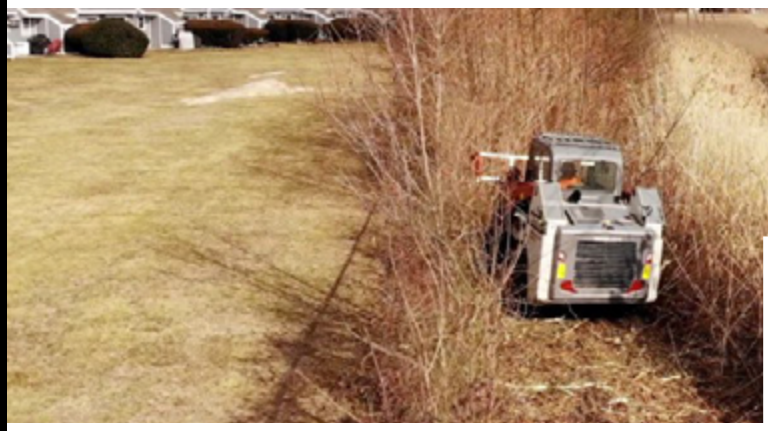

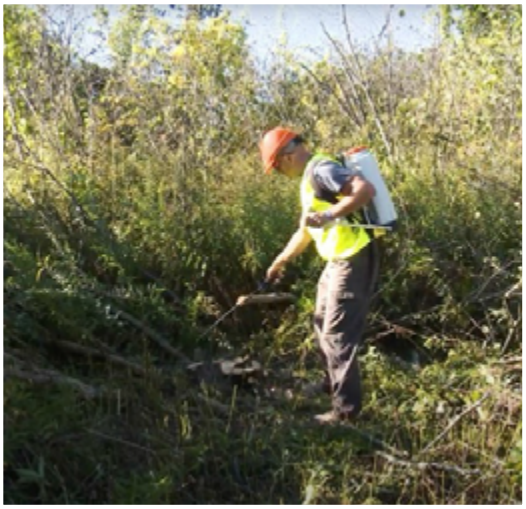

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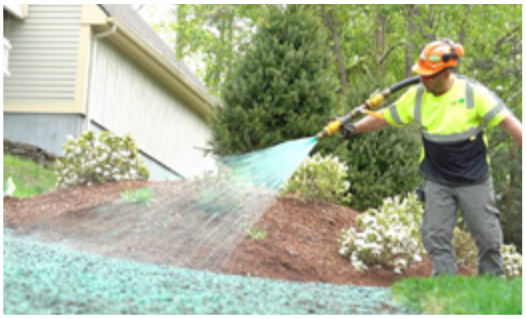

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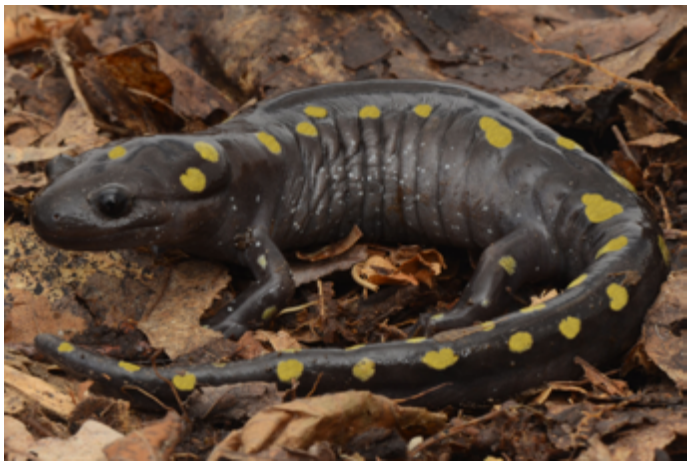
vernal pools, continued from page 4

where the upland habitats of the salamanders, which travel between the upland and the vernal pools at different points in their life cycle, were located some 1,200 feet or more away from the vernal pool, necessitating the preservation of the corridor between the upland habitat and the vernal pool. You can lose development of substantial areas through the need to preserve this unique type of habitat". [1]

While some of Merriam's statements have been refined by subsequent research and practice, the fact remains that there are few wetland resources that are as mysterious, maligned, and misrepresented in land use proceedings as vernal pools. Because assessment and conservation of vernal pools is determined through a science-based, data dependent methodology, there are ample opportunities for these resources to be used and abused by various interest groups.



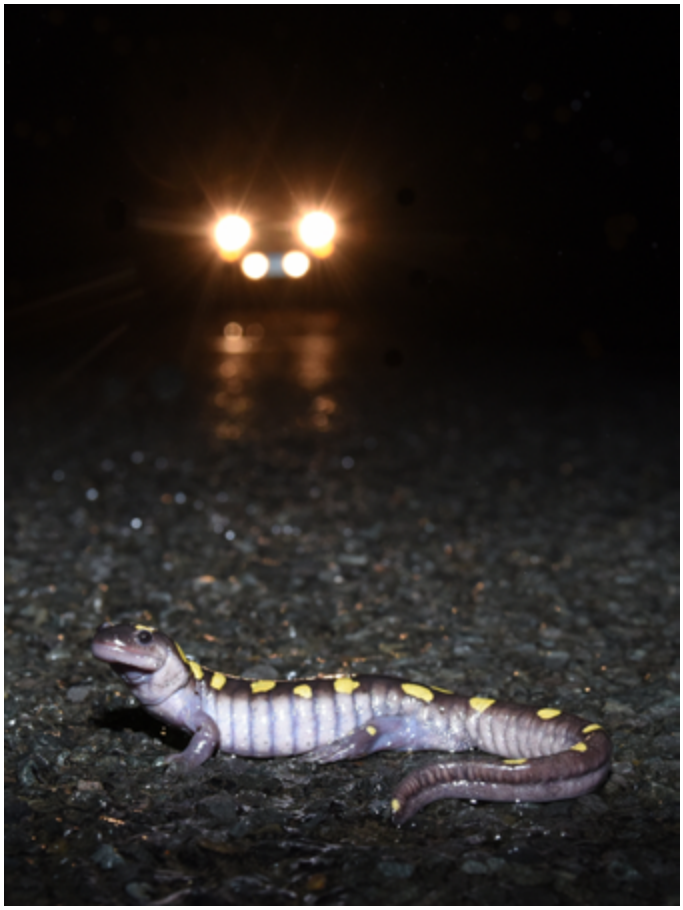
Adult spotted salamander. Photo by Dennis P. Quinn

Having recognized this dilemma several years before Merriam's book, Dr. Aram Calhoun and I convened a working group of scientists and land-use managers from across the Northeast with the goal to create a guidance document on how to responsibly develop within vernal-pool ecosystems. This resulted in the publication of Calhoun and Klemens (2002*) Best Development Practices: Conserving Pool- Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*. [2] The goal of that document was to provide a simple and consistent method to determine the quantitative value of a vernal pool based on objective biological and landscape criteria.

vernal pools, continued on page 7

vernal pools, continued from page 6
However, despite the availability of this and other Best Development Practice (BDP) guides, there remains a very jaded view of vernal pools by many local decision-makers, attorneys, and developers. Adding to this antipathy is that too often vernal pools are weaponized by anti-development interests without regard for the real biological value (or lack thereof) of the pool. So let me try to untangle some of the issues, pitfalls, and abuses concerning vernal pools that confront property owners, inland wetlands commissioners and land-use staff throughout the State.

Data: The Calhoun and Klemens BDP was intended to aid local decision-makers understand the relative values of multiple pools on a landscape so as to focus efforts on the conservation of those pools deemed of high conservation value. The limitations of this approach are that there are relatively few instances where large parcels of land containing multiple pools allow data-informed decisions. Most vernal pool reviews are of a single pool. As vernal pools depend upon significant areas of upland habitat (750 feet from the pool's high water mark) this often means that the upland habitat falls into multiple ownerships. This is exemplified by pools found in more fragmented landscapes which encompass large portions of southwestern and central Connecticut. A review of vernal pool-generated land use conflicts finds a disproportionate number of these occurring in densely developed Fairfield, New Haven, and Hartford counties.



Road mortality is a major impact to vernal pool amphibians. Photo by Dennis P. Quinn

Applicants often fail to provide sufficient data to evaluate vernal pool resources. This provides an easy target for opponents. Simply stated, it is the applicant's burden to provide sufficient data for an agency and the public to evaluate potential impacts to wetland resources including vernal pools. "Sufficient" from an ecological perspective means that there has been enough time expended to properly document the productivity of a pool(s) or the lack of vernal pool species. Researchers must make a significant effort to prove the negative, the absence of obligate species, with a fair degree of certainty. "Went out, spent an hour or two, and saw nothing" just doesn't cut it. Repeated visits and varied sampling techniques are needed to determine which species are using a particular pool or wetland. In an ongoing study I am involved in, despite log rolling and larval sampling repeatedly from May through August 2021, no vernal pool breeding salamanders were found. Usually one finds some evidence of breeding salamanders through terrestrial searching, especially in late spring and early autumn. Returning to the site in early spring of this year, we documented two species of salamanders using the pool that had eluded our team the previous year.

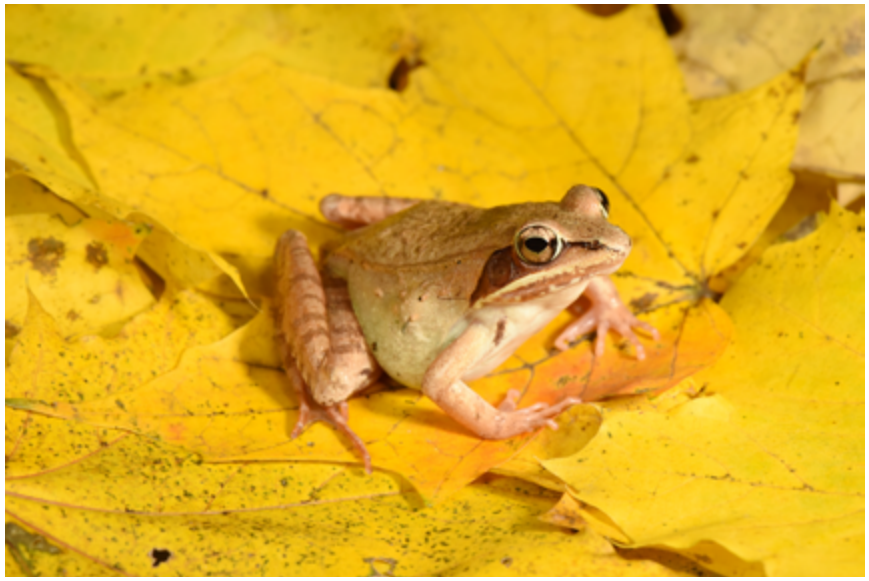
Another tactic to avoid dealing responsibly with potential pools that has been employed is applying for regulated activities in late autumn/early winter. The timing of such applications results in a statutory timeline that dictates opening and closing the public process, including hearings if the activity is deemed significant, before the seasonal onset of vernal pool species' breeding in March and April. This places the reviewing agency (and the public) in a dilemma. The application can be deemed incomplete and denied without prejudice. However, the response to an untimely application varies considerably from town to town, as does concern or skepticism concern-

vernal pools, continued on page 8

vernal pools, continued from page 7

ing vernal pools. One solution to this dilemma may be amending a town's wetland regulations to require a seasonally appropriate study of a vernal pool.

The Sec. 8-30g Vernal Pool: Applications for affordable housing developments using the Sec. 8-30g Connecticut statutory provision which supersede many of a town's zoning regulations have a uniquely unsavory relationship with vernal pools. Certain environmental issues, including wetlands and public health/welfare must be considered in a Sec. 8-30g application. Because the link between wood frogs (a vernal pool species) and water quality has been established and upheld by the courts (River Sound Devt., LLC v. Inland Wetlands, 2 A.3d 928, 122 Conn. App. 644, 2010), vernal pools, actual or hopefully imagined, are often at the forefront of arguments against an Sec. 8-30g application. This fuels public skepticism about vernal pools *writ large*, and makes conserving vernal pools of high ecological value and integrity more difficult. The Achilles heel of such Sec. 8-30g applications is that they most often fail to have studied seriously, if at all, the presence of vernal pools and their indicator (obligate) species. In a recent proceeding in New Haven County, the applicant had invested in a vernal pool study and despite the attempts of the neighbors to play the "vernal pool card" the applicant prevailed because he had taken the resource seriously and conducted the needed analyses as part of his application to the IWWA.



The wood frog (Rana sylvatica) is a widespread vernal pool indicator species. Its tadpoles play a major nutrient cycling role in vernal pools. Along with the spotted salamander, it is the most ecologically plastic of Connecticut's vernal pool species, able to exploit a wide variety of small wetlands.
Photo by Dennis P. Quinn

So what can you as a commissioner do when confronted by experts with divergent opinions concerning a vernal pool resource that is the subject of a land use proceeding? A commission may engage an independent third party review, but one can also weigh the testimony and credibility of the opposing witnesses. One can look at the respective research outputs of the witnesses and other credentials, but most importantly one should examine the consistency of the testimony of a witness between matters where she/he is engaged. Is there a different approach taken when the witness works for a developer versus an intervenor? If there is, that should be a red flag to scrutinize that testimony very closely. Consultants can represent an applicant, a town, or an in-

vernal pools, continued on page 9

vernal pools, continued from page 8

tervenor, but they must consistently employ the same standards and methodologies from project to project, irrespective of who is paying the bill.

The Accidental Vernal Pool or a.k.a. Replace Your Divots: This golfing term is applicable to property owners, especially those who are excavating materials from the ground, most notably sand and gravel. Left ungraded or not filled in, these depressions often hold water, and if near a wooded swamp or other wetland system, can be colonized by wood frogs and spotted salamanders. These species are the most likely of vernal pool amphibians to exploit water holding habitats created by earth moving activities. Vernal pools are defined by indicator (obligate) species. The anthropogenic origin of such pools has little bearing on their biological value. A simple solution is to not leave a landscape pocked with burrow pits after gravel mining. I have one unhappy client in southeastern Connecticut who has two such features on his property and has been trying for several years to untangle his right to productively use his property versus two marginal borrow pits containing wood frogs and spotted salamanders.

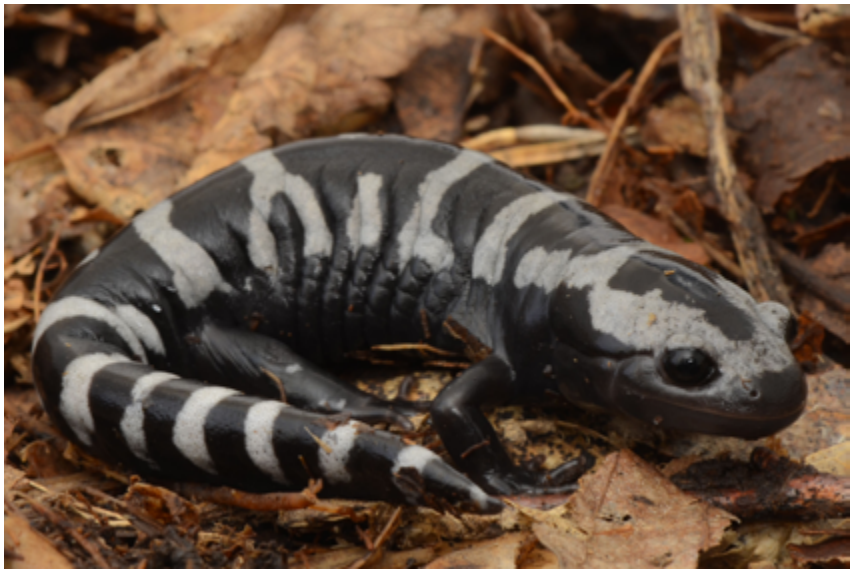
Every vernal pool requires 40-acres of undeveloped upland habitat a.k.a. The Great 40-acre Hysteria: It is not rocket science to take a small vernal pool, maybe a few hundred feet in diameter, and from that extrapolate that the pool needs many acres of surrounding upland habitat. Forty acres seems to be the metric commonly used by vernal pool deniers as a reason to discount what they often refer to as "vernal whatnots." These alarmists don't read the fine, or not so fine print, in various assessment manuals that clearly state that conservation of ***exemplary pools*** is best achieved by limiting *de novo* development to 25% of the upland habitat while recognizing that many pools are functioning with 50% of their upland habitat intact. Pools that do not fit these criteria as exemplary are best treated as wetlands. Repeat, even exemplary pools can tolerate a reasonable amount of development in the surrounding uplands. No scientist has ever posited that vernal pools require a complete prohibition on any development—even those pools deemed to be exemplary.

It is all about the science—the data—which people seem reluctant to put the energy into gathering. Almost every controversial vernal pool matter that I have re-

vernal pools, continued on page 10

vernal pools, continued from page 9

viewed involves moderate to poor quality pools in developed and fragmented landscapes. I have watched agencies in southwestern Connecticut agonize for hours over vernal pool-friendly native plantings for a single house near a marginal vernal pool in a densely fragmented suburban landscape, even though the vernal pool has little chance of long term survival because of the amount of fragmentation and development. In another Fairfield County town I was asked by the town wetland officer whether a depression in golf course like expanse of manicured lawn in the midst of suburban landscape qualified as a vernal pool. Are you serious?



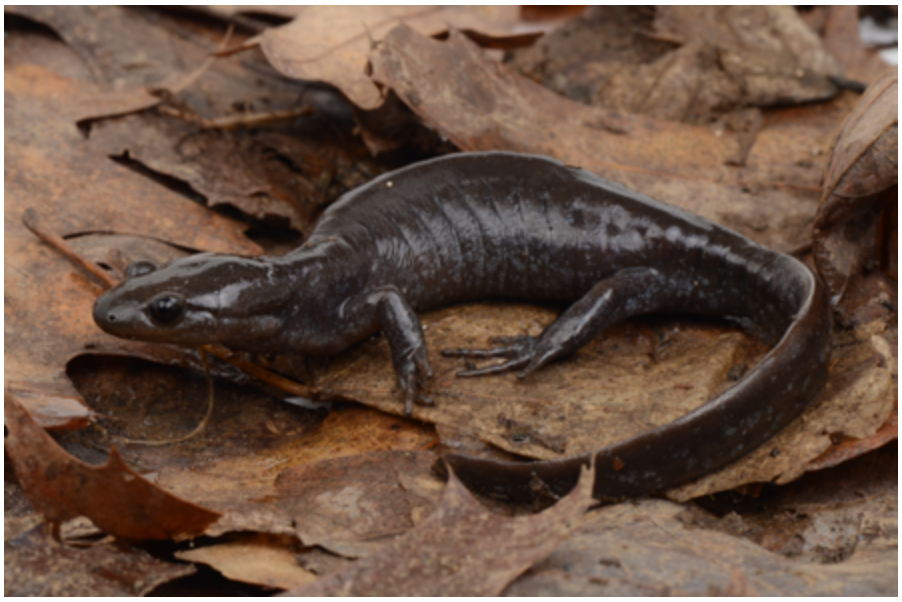
The marbled salamander (Ambystoma opacum) is widely distributed in Connecticut at lower elevations. It becomes rare at higher elevations. Marbled salamanders breed in the autumn, depositing their eggs in the bottom of dry vernal pools. When the pools fill later in the season, the eggs hatch and the larvae develop over the winter. Because of their protracted larval period this species favors long-hydroperiod vernal pools which are often imbedded within larger wooded swamp systems. Photo by Dennis P. Quinn

Vernal Pool Success Stories: I have spent a lot of time outlining where vernal pool regulation and conservation has "gone off the rails." There have been some outstanding successes in vernal pool conservation in landscapes that have multiple pools, and science is used to determine those most worthy of conservation. One such site was The Preserve (now known

vernal pools, continued on page 11

vernal pools, continued from page 10
as The Preserve State Forest) in southeastern Connecticut where multiple interconnected vernal pools of exceptional biological productivity were identified and protected.

In another instance**, t**he expansion of a large trap rock quarry in north-central Connecticut identified multiple vernal pools on the site and created an extraction plan that avoided these pools and their wooded upland habitats. The quarry has also funded an on-going study of the productivity of these pools to assess if any impact is occurring from the ongoing quarrying activities.



Jefferson salamander (Ambystoma jeffersonianum) occurs west of the Connecticut River. They require large tracts of intact forest and are therefore becoming increasingly rare and are a State-listed Special Concern Species. Jefferson salamanders frequently hybridize with blue-spotted salamanders. Most of these hybrids are females and have extra sets of chromosomes (e.g., triploids and tetraploids). These hybrids are difficult to identify and are highly variable. Photo by Dennis P. Quinn

Many towns are conducting inventories of their vernal pools, assessing through citizen-science where their most important and productive vernal pools are located and integrating those data into their Natural Resource Inventories (NRIs) and Plans of Conservation and Development (POCDs). Ideally those data are vetted by scientists familiar with vernal pool species. Key to the success of any program to conserve vernal pools is a strong and scientifically proficient inland wetlands agency. Strong enough to deny applications that exploit seasonal windows, strong enough to deny without prejudice applications lacking in data, strong enough to see through opponents using vernal pools as a cudgel, and scientifically proficient to evaluate data (or seek help to do so). That is a tall order, but I have seen many agencies rise to the challenge and hope that more will be inspired to do so in the future.

The future of Connecticut's vernal pools rests upon the ability of local agencies to sort through competing claims concerning the value of a pool or cluster of pools, and to balance those interests in fairness to the applicant and the public trust in the natural resources of the State. If there is one resource where a "one size fits all" approach does not work, it is vernal pools. They require careful analysis of the data. Expanded Upland Review Areas (URA's) for vernal pools make sense. What it does mean is that an IWWA has the ability to ***easily review*** those larger areas as part of a wetlands application. Too often, URAs are considered to equate to buffers or protected areas. An expansive review around vernal pools is just that, a review, not a prohibition against development or the reasonable use of one's property. Regrettably, people seize on the "40-acre hysteria" to thwart any serious consideration of how to conserve these valuable wetland resources.

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1. Merriam, D. H. 2005. The Complete Guide to Zoning. McGraw-Hill Companies, Inc. New York, NY. 0-07-146524-3.

2. Calhoun, A. J. K. and M. W. Klemens. 2002. Best Development Practices: Conserving Pool-breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

About the author: Dr. Michael Klemens of the American Museum of Natural History has been studying Connecticut's amphibians and reptiles since the 1970s. *He acknowledges several colleagues who provided helpful information, insight, and critique to this discussion.*

CAWS monitoring program, continued from page 1

In 2007 the Connecticut Association of Wetland Scientists ("CAWS") initiated a vernal pool monitoring program. We hoped to explore some of the factors behind the overall decline of vernal pool obligates. Over the past 14 years we have monitored vernal pools prior to, during and following construction of development projects that share a landscape with the pools. Additionally, we have monitored pools on protected landscapes for comparison purposes.

In total we monitored more than 50 pools, in 15 towns across four counties in Connecticut. CAWS volunteers conducted more than 320 monitoring inspections.

We developed a simple protocol whose centerpiece was the counting or estimation of egg masses laid by the two most common vernal pool obligate amphibians in Connecticut (Wood Frog and Spotted Salamander). We developed a standard data sheet and conducted training sessions for our members.

We faced a number of challenges while running the program. Despite a wide reaching publicity program, landowner participation was less robust then we had hoped for. To encourage private landowners to participate in the program we agreed to only release data we collected in an anonymized fashion, so that the data could not be tied back to a particular project or landowner.

Initially we proposed two spring inspections per pool, but in practice most of our members could conduct only one spring time inspection per year. Because Wood Frogs generally breed one or more weeks before Spotted Salamanders do, and develop more rapidly, it was not possible to capture the maximum breeding effort of both target species in one inspection. We found that only one inspection was either too early to count all of the Spotted Salamander egg masses that would eventually be laid in the pool, or too late to identify and count the Wood Frog egg masses, which had already begun to hatch. The fact that breeding and egg

CAWS monitoring program, continued on page 13

Figure 1

Obligate Vernal Pool Amphibians

Natural Diversity Data Base Listed Species

Jefferson Salamander

("Special Concern")

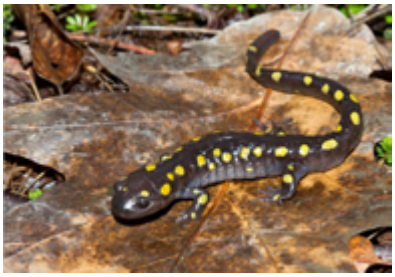
Blue-spotted Salamander

(Diploid population - "Endangered" "Complex"/hybridized - "Special Concern")

Spadefoot Toad

("Endangered")

CT DEEP Species of Greatest Conservation Need (Designated "Important")



Spotted Salamander

Marbled Salamander

Wood Frog

CAWS monitoring program, continued from page 12

laying are often protracted further complicated our ability to enumerate all egg masses that would eventually be laid in a pool in one inspection.

Some pool-specific conditions also limited our ability to find egg masses in the pools, including surface pollen and algae, deep and/or dark water, and dense shrub patches.

As a result of all of these factors, the data that we collected should be viewed as qualitative, not quantitative. However, we believe that we were able to identify some broad and important patterns and trends through our monitoring efforts.

Last year several of our members collaborated on a summary report that describes the monitoring program methods, results and conclusions. This report can be found on the CAWS website, www.ctwetlands.org, under the "Programs" tab.

We analyzed land cover changes from 1985-2015 in three zones (Calhoun and Klemens 2002[1]) around 12 case study pools, using public data made available by the University of Connecticut. The "Vernal Pool Depression" (VPD) represents the maximum flooding limits of the vernal pool. The "Vernal Pool Envelope" (VPE) zone extends 100 feet beyond the edge of the VPD. The "Critical Terrestrial Habitat" (CTH) zone extends 650 feet beyond the limits of the VPE zone. We identified five important lessons that we learned from the monitoring program:

1. Amphibian breeding effort varies, sometimes substantially, from year-to-year. Because of this, multi-year baseline investigations are recommended, if possible, as part of a permit application.

2. Amphibian breeding and egg-laying are often protracted, spread across up to one week, and possibly more. Thus, multiple spring inspections of a vernal pool are recommended for a permit application.

3. Amphibian populations can persist on moderately altered landscapes. We monitored two vernal pools that conformed with the Calhoun and Klemens (2002) recommendation that no more than one quarter of the CTH zone be disturbed by

CAWS monitoring program, continued on page 14

CAWS monitoring program, continued from page 13
development (along with no disturbance to the VPD and VPE zones). We documented variable but robust breeding by Wood Frogs in the two pools that complied with these guidelines.

4. We monitored several pools that experienced significant sedimentation during construction. Land clearing extended very close to the edge of the VPD, leaving only a very narrow buffer to protect against the export of sediments to the pool from the construction site. The sedimentation caused an increase in turbidity, and along with greater solar input from the reduced canopy, resulted in severe algal blooms. Breeding by the two target amphibian species ceased in the years following the sedimentation. These observations make a strong case for preserving the entire 100-foot wide VPE around a vernal pool.

5. We monitored one vernal pool that initially supported robust breeding by Wood Frogs (up to 1,000-1,250 egg masses). This was surprising, given the relatively small amount of forested habitat in the CTH zone (37%) around this pool. We believe that the Wood Frogs were exploiting a forest block approximately 900 feet distant from the pool edge, but well within the reported migratory range of these animals. When the ecological connection between the pool and this forest block was severed by development, the Wood Frog egg mass count plummeted by approximately a factor of 10, and never recovered. These results highlight the importance of maintaining ecological landscape connections between the pool and habitat elements that may exist beyond the limits of the CTH zone.

Perhaps the most important conclusion that we reached through our monitoring efforts is that amphibian populations and development can coexist on a landscape, providing that the development design preserves the water quality of the pool and maintains critical habitat linkages between the pool and distant habitat elements, such as forest blocks, wetlands, and other vernal pools. However, as noted above, this amount of habitat conservation is very challenging under the current legal framework.

The population trends for obligate vernal pool amphibians are certainly discouraging, and no group will benefit if these trends continue unabated. This is even true for landowners and developers, who often view vernal pools as impediments during the permit review process. It is in their collective interest to prevent species from continually being added to the Natural Diversity Database, since the occurrence of an NDDB record on a property under development consideration adds time and expense to the permit review process.

Our long-term monitoring program studied two development projects whose designs were entirely or mostly consistent with the recommendations of Calhoun and Klemens (2002), and in which Wood Frog populations were maintained. All stakeholders will benefit if these guidelines are incorporated into future land development.

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Wood Frog https://suttonmass.org/animals/frogstoads/woodfrog/
Spadefoot Toad http://www.beardsleyzoo.com/project/eastern-spadefoot-toad/

About the Author: Edward M. Pawlak, MS, owner of Connecticut Ecosystems LLC, is a Registered Soil Scientist, Certified Professional Wetland Scientist, and former president of Connecticut Association of Wetland Scientists (CAWS). He initiated the CAWS vernal pool-monitoring program and has identified potential vernal pools by aerial photograph interpretation in over twenty towns and field verified several dozen vernal pools for towns in Connecticut.

CACIWC news, continued from page 2

the commission in determining methods for their protection following any adjacent development.

This issue also includes a summary of the early evolution of the IWWA, including key Connecticut court cases occurring during the first decade. We plan additional wetlands-themed articles in upcoming issues.

In other news:

1. During this past several years, the CACIWC Board of Directors and Annual Meeting Committee have reviewed the many comments and suggestions submitted in response to our recent conferences, converted to virtual events due to the risks of the COVID-19 pandemic. These comments and suggestions are again being reviewed to help select the speakers and workshops for our upcoming **45th Annual Meeting and Environmental Conference**, to be scheduled this fall. Please do not hesitate to contact us soon with any additional suggestions that you may have for speakers and workshops for this conference at AnnualMtg@caciwc.org. We are especially interested in any suggestions that you may have for speakers that can discuss the 50th Anniversary of the CT IWWA. Please note that we are considering various venues and dates as we review sites for a possible hybrid or in-person conference, while we watch newly emerging Omicron subvariant activity associated with the COVID-19 pandemic. Watch our website for the save-the-date notice and additional conference news at www.caciwc.org.

2. Although our expenses for preparing issue of *The Habitat* and conferences have grown, the Board of Directors has decided to maintain our **CACIWC 2022-23 membership dues** at the 2021-22 rates. We have added a new student membership category to help attract high school and college students to our organization and encourage them be more involved with local and statewide conservation efforts. Membership renewal will again qualify your commission members and staff for greatly discounted registration fees for the upcoming annual conference. We will be sending a membership renewal reminder along with links to our current renewal online and mail forms found on our website: www.caciwc.org.

3. **Improved membership communication** is an important goal of our strategic plan. Our Membership Coordinator & Database Manager Janice Fournier will again be seeking updated commission contact information as part of the 2022-23 membership renewal and 2022 annual conference registration process. Please be certain to provide us with updated contact information, including emails of commission chairs and staff, to help Janice maintain an up-to-date membership list. Janice will also be asking for emails of individual commissioners in member commissions to help expand distribution of *The Habitat* and start our new and expanded **CACIWC Listserve**.

All of us on the CACIWC Board of Directors continue to thank you and your fellow commissioners and staff for your local efforts and your ongoing support through this challenging pandemic. We hope your stories and photos will help us reminisce of pre-pandemic times during our 50th anniversary Connecticut's IWWA celebration while we plan for future in-person conferences and other events!

Thank you,
Alan J. Siniscalchi
President, CACIWC

legal, continued from page 3
designated wetlands areas.' "[4] From the earliest days agencies were not limited to activities that were conducted solely in wetlands/watercourses.

That same applicant complained to the court that its septic system fell within an exemption. The Supreme Court instructed the applicant to go before the agency and prove that its exemption was for the agency to determine.[5]

Around the same time, in the *Obeda* case (1980) the Supreme Court dispensed with and nullified all reasons cited for the removal of an agency member by the Board of Selectmen. As for failure to disqualify herself because she was antagonistic to applicants, the Court responded: "disappointed applicants . . . miscontru[e] such rejections as being motivated by personal animosity."[6] The Board claimed the chairwoman rude to other commission members. The Court response: "Discourtesy and even rudeness not amounting to illegality of conduct, or to oppression under color of office, hardly rise to the level of cause for removal from office."[7] The claim of the chair's inability to control the meetings was deemed by the court to be a personality clash which was an insufficient ground to remove her. As for the claim that she sought the resignation of a fellow commission member, the Court responded she was free to express herself: "A free society should encourage the fullest and freest expression of views by public officials without subjecting them to the risk of removal if those views happen to displease higher authority."[8] In sum, the Board of Selectmen relied on the "cumulative effect" of the charges. The Supreme Court squashed that basis: "It requires more than a chain of insufficient causal links to justify removal of a public official from office."[9] The Court sent out the message: don't come complaining to the courts with your members under a microscope in order to control the outcome of permit applications.

Almost a decade later (1989) the Supreme Court affirmed the trial court's ruling that a commission chairman was "unquestionably a zealot."[10] Yet absent a finding that he was biased or prejudiced his action did not constitute a conflict of interest or predetermination.[11]

A commission's authority to enforce the Act in court was supported by the courts from the outset. In 1984 the Supreme Court upheld a trial court granting extraordinary relief (temporary injunction) as well as an injunction after trial. The landowner had gone into a watercourse to repair a dam without a permit defending itself in court arguing that various exemptions applied. The trial court found no factual basis for the exemptions and awarded the commission its attorney's fees.[12] The landowner appealed to the Supreme Court and did not prevail, resulting in the award to the commission for its attorney's fees on appeal.[13]

Thus, in little more than a decade all of the structure for a faithful executing of the Act was in place and upheld by the Supreme Court: (1) members would be unfettered from micromanaging town officials in carrying out the Act; (2) their decisions would have to be science-based and open to the applicant's rebuttal and public's view; (3) acts within the jurisdiction of the agency include those outside of wetlands/watercourses which have an effect on those resources; (4) a claim of exemption was not sufficient to avoid a permit requirement either before the court or the commission – either prove the exemption applied to the agency's satisfaction or apply for a permit; (5) a commission's acts to enforce the permit provisions will be supported in the courts with, where appropriate, the award of attorney's fees to the prevailing commission. A very strong beginning to the Act for agencies.

Not so for environmental intervenors. In this same initial timeframe the Supreme Court ruled that: "local inland wetland bodies are not little environmental protection agencies. Their environmental authority is limited to the wetland and watercourse area that is subject to their jurisdiction."[14] The noise and air pollution aspects of traffic for a regional post office, the court concluded, should have been raised elsewhere. Eigh-

legal, continued on page 17

legal, continued from page 16

teen years later the Supreme Court revisited this issue and came within one vote of abandoning this narrow holding in *Nizzardo v. State Traffic Commission*,[15] a 4-3 decision, with lengthy majority and dissent portions in the decision. Ultimately, for now, the court has affirmed the holding that the Connecticut Environmental Protection Act (CEPA) does not enlarge the jurisdiction of administrative agency. For inland wetlands agencies that means an environmental intervenor may bring to the agency's attention only the effect on wetlands and watercourses.

In my next column we'll examine the past three decades and contemplate: were they really that bad wetlands commissions or just variations on a theme?

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(Endnotes)
1 Feinson v. Conservation Commission, 180 Conn. 421, 429 (1980).
2 Feinson v. Conservation Commission, 180 Conn. 421, 426 (1980).
3 Tanner v. Conservation Commission, 15 Conn. App. 336, 341 (1988).
4 Aaron v. Conservation Commission, 183 Conn. 532, 542 (1981).
5 Aaron v. Conservation Commission, 183 Conn. 532, 547-549 (1981).
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11 Cioffoletti v. Planning + Zoning Commission, 209 Conn. 544, 554 (1989).
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Join CACIWIC in Celebrating the 50th Anniversary of Connecticut's Inland Wetlands Act!

This is a special year for CACIWC and its members as 2022 marks the **50th Anniversary of the Connecticut Inland Wetlands and Watercourses Act (IWWA)**. This key enabling legislation, which was approved by the Connecticut General Assembly (CGA) during May 1972, led to the formation of local inland wetlands commissions throughout Connecticut.

CACIWC has been planning for the 50th Anniversary of the CGA passage of Connecticut's IWWA since we celebrated our 40th Annual Meeting in 2017. As we mentioned in the fall issue of *The Habitat* and at our 2021 annual meeting, we are dedicating our fall 2022 45th Annual Meeting and Environmental Conference to the CT IWWA anniversary. CACIWC is also working with other Connecticut conservation organizations who value wetlands and watercourses to help celebrate the anniversary throughout the year.

As part of the anniversary celebration, CACIWC will be including articles in *The Habitat* on the history of the IWWA along with stories on commission activities throughout the past five decades. Please contact us at TheHabitat@caciwc.org if you wish to include stories and photos of early years of wetlands protection by your town commissions.

You may also submit these photos and stories as part of our s**pecial IWWA photo contest and commission awards** to be given as part of our year-long celebration. All CACIWC members are eligible to enter. Please see the link to our nomination form on our website, at www.caciwc.org.