

Committee on Environment & Natural Resources
% Legislative Information Office
100 State House Station
Augusta, ME 04333

May 5, 2025

RE: LD 1882, Resolve, Directing the Department of Environmental Protection to Conduct Rulemaking Regarding Significant Vernal Pools

Dear Senator Tepler, Representative Gramlich, and Members of the Environment and Natural Resources Committee:

My name is Aram JK Calhoun. I am a retired Emerita Professor of Wetland Ecology and Conservation in the Department of Wildlife, Fisheries, and Conservation at the University of Maine.

Relevant personal background:

My colleagues, graduate students and I have studied vernal pool ecosystems and policy and management for over 25 years. My colleagues and I have published dozens of peer-reviewed papers and three books on vernal pool ecology and the post-breeding habitat needs of vernal-pool dependent species including wood frogs, spotted salamanders, and the blue-spotted complex. We have focused our research on post-breeding habitat needs of these species in both working forest and developed landscape settings with special attention to life history events including migration to and from pools, summer habitat, and winter hibernation.

We have tracked habitat needs and uses by outfitting animals with radio-transmitters, among other research methods. We have also used camera trapping studies of vernal pools to document the extensive use of vernal pools from spring through fall by many other species that partake in the bounty of protein in the form of eggs, larvae, juveniles, and adults. Others use the pools as summer refugia from heat, drought, or aggressive pond mates in permanent waters. Wildlife observed using pools include but are not limited to moose, deer, bear, fisher, mink, pine marten, skunks and raccoons. Spotted and Blandings turtles (both listed species) rely on pool networks for foraging and resting; ducks, sandpipers, herons, hawks, owls, songbirds, etc. have all been seen feeding on amphibians from these oases of protein in a matrix of forest.

Legislative history:

In the nineties, I was part of a team of professionals led by the State Planning Office to develop strategies to better protect vernal pools and other small wetlands. Out of this effort grew some voluntary approaches including development of Habitat Management Guidelines for Forestry; Best Development Practices for Residential and Commercial Development; a Municipal Guide for Mapping and Conserving Vernal Pools; and voluntary pool mapping projects. Ultimately, after ten years of collecting and sifting through data, it was determined that in development settings, legislation would be required. I was part of the team that helped draft the original vernal

pool legislation and subsequent rules, based on the best available science tempered by political realities) in the early 2000s. As it was, we were asked to use the data on egg mass counts we had from our surveys to try to include only the “cream of the crop” but no more than 50% of all pools as Significant Vernal Pools (SVPs) that would be subject to the rules. Unfortunately, as it turned out, the current egg mass thresholds we set at that time only capture less than 25% of all pools submitted for permit review.

Both the legislation and the rules that were passed for Significant Vernal Pools have been challenged multiple times since then, and in 2013 they were greatly weakened by loosening regulations around the pool basin based on ownership patterns.

Following that, another bill to remove the legislation altogether was submitted shortly after. I testified against that bill and the then chair of the Environment and Natural Resources Committee said, in loose quotes, “*Dr. Calhoun has already convincingly taught us the value of pools and we do not need to hear this testimony again.*” I had submitted extensive summaries of our research supporting the legislation and had provided resources to the committee the first time around and was pleased that the message had been received.

Notably, at that time, the development community, at the hearing, asked me to consider the needs of their community as well. I took that to heart and engaged a 25-person stakeholder group to address economic issues as well as pool protections. In response, our team of developers, economists, federal and state agencies, and municipalities designed an alternative mitigation tool called a Special Area Management Plan for Vernal pools (VP SAMP) that we are successfully implementing in both Orono and Topsham now.

Current Situation:

With many more years of research behind us confirming the ecological significance of vernal pools and the surrounding forested habitat, and many interactions with municipalities, consultants, and developers, here we are again in 2025 recommending some minor changes to tighten up the holes in the legislation. For those who are concerned that this will present a big imposition on both landowners and developers, I want to make clear a few things folks might not realize:

1. Still, less than 25% of all submissions for permits turn out to be significant vernal pools and the vast majority of those that are SVPs receive permits.
2. A significant number of submissions are for power lines and ROWs.
3. As of 2020, no permits for development within SVP habitat have been denied.
4. The regulations do not say “no” to development, they simply require a permit and a consultant to work with the Department of Inland Fisheries and Wildlife and Department Environmental Protection (DEP) to first avoid, then minimize, and finally mitigate for unavoidable impacts per the Natural Resources Protection Act (NRPA) standards.

Ecological support for the changes:

Please note that our decades of research have shown that vernal pool ecosystems will not persist if the required habitat around the pools and connections to other wetland features and winter habitat are fragmented. A landscape-scale approach to conserving pools is necessary; a pool without habitat will simply serve as an urban wetland... not a vernal pool. We now know that vernal pools have much broader ecological functions with lots of wildlife depending on them and that we need to strengthen our current regulations to try to conserve some of that habitat in a developed landscape.

Dirigo means “I lead,” our motto. Well, eyes are focused on Maine as the leader in vernal pool protections in the *country*. I am working with a consortium of Midwestern states who contacted me to help them better conserve their vernal pool resources as they were impressed with our state regulations and the complementary VP SAMP program. We have the potential to lead New England and the Midwest into a wiser, more productive approach to wildlife conservation while developing in a sustainable fashion.

Recommended Changes:

The following minor updates to our current regulations are the first step in bringing back the intent of the original legislation: to give pools and the wildlife that depend on them the space they need to fully function as vernal pools.

1. Update definitions to include "significant vernal pool buffer" as the portion of the critical terrestrial habitat within 100 feet of the spring or fall high-water mark of the vernal pool depression;

- *This first hundred feet is critical to maintain pool shade, to provide coarse woody material to the pool as egg attachment sites and contribute organic matter that is the base of the pool food web.*
- *The first hundred feet is a staging area for adult amphibians in the spring and a safe haven for the majority of young amphibians leaving the pool in fall.*
- *The first hundred feet is a critical filter for toxins generated by landowner activities and is a bit of a buffer from pet predation on amphibians.*

2. Update the habitat management standards for significant vernal pool habitat to include “no disturbance” within the significant vernal pool buffer (*same as #1*);

3. Update the habitat management standards for significant vernal pool habitat so that critical terrestrial habitat bisected by property boundaries is afforded the same protections as properties where vernal pool depressions are present; and

- *Obviously, the pool and the surrounding critical terrestrial habitat know no political boundaries. This is a human artifact, and it makes no scientific sense to treat the pool and surrounding area on one property differently from an adjacent property just because*

it includes the pool depression. No other Significant Wildlife Habitats are treated this way, and vernal pools should not be either.

4. Adjusting dates related to drying under significant vernal pool habitat identification criteria to July 15th for vernal pools located in northern Maine and July 1st for vernal pools located in southern Maine.

- *This will allow plenty of time to document breeding activity where present.*

In closing let me remind you how important it is to not only protect the vernal pool depression but the surrounding terrestrial habitat as well. This legislation does just that, but still only protects a small fraction of the pools on the landscape, and a small portion of the terrestrial habitat that is used by pool-breeding amphibians. I urge you to support these changes.

Thank you for your consideration,

Dr. Aram Calhoun

Resources and References:

- See [Of Pools and People](#) website for pdfs of our many presentations and publications on these topics
- [Best Development Practices: Conserving Pool Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States](#) ([pdf](#))
- [Forestry Habitat Management Guidelines for Vernal Pool Wildlife](#) ([pdf](#))
- [Maine Municipal Guide to Mapping and Conserving Vernal Pool Resources](#) ([pdf](#))
- [Conserving Maine's Significant Wildlife Habitat: Vernal Pools](#) ([pdf](#))
- Special Area Management Plan ([SAMP](#))

Addendum to Calhoun Testimony

*Excerpted from Hunter M.L., T. Persons, AJK Calhoun, PM deMaynadier, D. Yorks (eds.) In press (July 2025 available.) **Wood Frog**, In *Amphibians and Reptiles of Maine*, 3rd edition, University of Maine Press.*

CONSERVATION: Conservation of pool-breeding amphibians in Maine requires a “pools-plus-forest” or landscape-scale approach. Although Wood Frogs are currently described as “abundant,” we note that this is a fragile abundance: the pools

and forests that determine Wood Frog long-term viability are increasingly impacted by fragmentation and loss to development and other land use practices. Because Wood Frogs depend on both aquatic and terrestrial habitats and the forested migration routes that connect them, the current approach of regulating circular zones around pools (distances varying by federal and state regulations) does not begin to encompass their post-breeding habitat requirements. Negative effects on Wood Frogs resulting from development around vernal pools are well-documented, and include fragmentation of migration routes (Calhoun et al. 2014; Hastings et al. 2023), increases in incidences of ranavirus and other disease mortality events (Gahl and Calhoun 2008, 2010; Greenspan et al. 2012), increases in exposure to salt and other chemicals (Frymus et al. 2022), and increases in encounters with common suburban predators (Eakin et al. 2019 a,b,c; Hastings et al. 2023). Additionally, climatic shifts—most notably increases in winter thaws, decreased snowpack and increased icing of hibernation sites, unpredictable rainfall patterns, and warmer spring and summer temperatures resulting in pools drying early—challenge persistence of Wood Frog populations.

Conservation of all pool-breeding species requires: (1) linking breeding pools to habitats associated with their complex seasonal life history needs; (2) conserving a wider range of pool hydroperiods; and (3) conserving alternative breeding venues such as beaver flowages and small, slow-moving streams (Cunningham et al. 2006, 2007). Local initiatives to embrace a pools-plus-forest approach will be the most effective way to conserve “poolsapes” (see the Maine Vernal Pool Special Area Management Plan for municipalities at www.vernalpools.me; Baldwin et al. 2006b; Baldwin and deMaynadier 2009; Freeman et al. 2012; Jansujwicz and Calhoun 2017; Levesque et al. 2017). At the private-landowner scale, adherence to published Best Development Guidelines (Calhoun et al. 2005) or Vernal Pool Habitat Management

Guidelines for Forestry (Calhoun and deMaynadier 2004) will improve “neighborhoods” and forests for Wood Frogs and other pool-breeding amphibians.