

# VERNAL POOLS: REGULATORY PROTECTION IN MASSACHUSETTS

## Introduction

The importance of vernal pool habitat has been recognized in Massachusetts for over 2 decades. Salamander surveys conducted in the early 1980s by the Massachusetts Audubon Society helped bring the importance of vernal pools into focus, and they were first given regulatory protection when the Massachusetts Wetlands Protection Act regulations (310 CMR 10.00) were revised in 1987.

Since 1987, other regulations have added vernal pool protection, including the Surface Water Quality Standards (314 CMR 4.00), Title 5 of the Massachusetts Environmental Code (310 CMR 15.00), and the Forest Cutting Practices Act regulations (310 CMR 11.00). Each of these functions independently of one another. A pool that is not protected under the WPA may still receive protection under any of these other regulations. Many municipalities have also added vernal pool protection into local wetlands and zoning by-laws. As a result, Massachusetts has the most significant, if in many ways confusing, regulatory protection for vernal pools in the country.

Vernal pool protection hinges largely, though not entirely, on official certification through the state's Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program. This process registers the location of a pool for which physical and biological evidence has been collected in the field. Across the board, among regulators, the regulated, and the general public, there is quite a bit of confusion and misunderstanding of the implications of certification, and also about the protection that is afforded vernal pools that are certified and those that are not. We start this section on protection with an explanation of why certification came to be within the context of the Wetlands Protection Act, and then analyze each set of regulations individually, looking at the way each functions.

**Massachusetts state regulations that provide vernal pool protection**

**MA Wetlands Protection Act regulations  
310 CMR 10.00**

**MA Surface Water Quality Standards  
314 CMR 4.00**

**Title 5 of the MA Environmental Code  
310 CMR 15.00**

**MA Forest Cutting Practices Act  
310 CMR 11.00**



## Certification

Vernal pools are not automatically protected under the Wetlands Protection Act for a variety of reasons. Vernal pools are not a wetland type like swamps, bogs, marshes, and ponds. Therefore, a vernal pool does not automatically come under the jurisdiction of the Act. Rather, “vernal pool” is a special habitat feature that may be present in a wetland, and can be looked at much like a snag, vertical sandy bank, or other distinct habitat feature of a wetland. If a wetland is jurisdictional, then its functions need to be identified, and may include wildlife habitat, such as vernal pool habitat.

Each wetland type has a list of functions that the Act presumes is protected by any individual wetland of that type. For Isolated Land Subject to Flooding (ILSF), there is no presumption of significance to wildlife habitat. This means that a project affecting ILSF does not need to avoid, minimize or mitigate impacts to wildlife habitat value unless evidence that demonstrates the ILSF’s wildlife habitat value is found. Certification provides a mechanism for establishing this wetland value, but is not required for a commission to protect wildlife habitat value for ILSF if evidence of wildlife habitat function is presented (see 310 CMR 10.53(1)).

The lack of a presumption of significance to wildlife habitat for ILSF is due to significant concern that there would be “innumerable, frequently insolvable disputes over the presence of [vernal pools] on Land Subject to Flooding” because of their small size and temporary nature. Therefore, the regulations create a presumption that vernal pools are present only when mapped through the certification process developed by the Division of Fisheries & Wildlife (see the Preface to 1987 regulatory revisions, section V. C.).

Like all presumptions about wetland values made under the WPA regulations, the presumption that ILSF is not significant to wildlife habitat may be over-come upon a clear showing to the contrary. Vernal pools can therefore be protected under the WPA if they aren’t certified when evidence showing vernal pool function is presented. The Conservation Commission and DEP have discretionary authority (at 10.53(1)) to protect uncertified pools on a clear demonstration of their existence. The Surface Water Quality Standards and Title 5 require certification; the Forest Cutting Practices Act regulations establish requirements for work around certified pools, and guidelines for work around uncertified pools.

The Official Guidelines for the Certification of Vernal Pools establish the specific criteria that must be documented to obtain certification of a vernal pool. They are based on the definition of vernal pool habitat in the regulations (310 CMR 10.04), and include both physical and biological criteria.

## Official certification

Certification was devised as a means of establishing the presence of vernal pools in advance of wetland permit applications. There was a lot of concern over potential uncertainty of the existence of a seasonal habitat feature when protection of wildlife habitat was added to the regulations. Vernal pool certification actually establishes a presumption that a vernal pool exists for purposes of the Wetlands Protection Act regulations.

## Jargon: ILSF

Wetlands that are situated in upland areas and which are effectively isolated from rivers, ponds, floodplains and other wetlands. These may overtop at high water and have temporary outlet streams, but most of the time they are isolated. ILSF are big - they hold enough water to cover a 1/4-acre of land with water one foot deep.

Due to their size and the amount of water necessary to qualify as ILSF, most often they function as vernal pool habitat.

## Discretionary Authority

10.53(1): If the issuing authority determines that a resource area is significant to an interest identified in [the Act] for which no presumption is established...the issuing authority shall impose such conditions as are necessary to contribute to the protection of such interests.

This gives the Commission or DEP the right - and responsibility - to protect vernal pools if clear evidence is presented at any time during project review.



### The Wetlands Protection Act Regulations (310 CMR 10.00)

#### Certification and Jurisdiction

Vernal pools are not a wetland resource area in the way that a forested swamp, pond, stream, or marsh is, and are not themselves protected by the Wetlands Protection Act (WPA). Therefore, official certification does not guarantee protection for vernal pools under the WPA. The certification guidelines facilitate determinations of vernal pool function. If the biological and physical criteria are satisfied, then a vernal pool exists (for purposes of the regulations). The trigger for protection of vernal pools is a jurisdictional determination made independent of the question of vernal pool function. Protection of a vernal pool hinges on jurisdiction, not function. With the functional question divorced from the jurisdictional question, vernal pools can occur in many different wetland resource areas or not in wetlands at all; they are found wherever the physical and biological criteria are met, regardless whether it is a jurisdictional wetland.

The “classic” vernal pool is a woodland depression completely isolated from other wetlands and waterways. To qualify as a jurisdictional wetland under the WPA, an isolated basin must hold a minimum ¼ acre-feet of water (10,890 cubic feet) to a 6” average depth at least once a year. These are “Isolated Land Subject to Flooding,” or ILSF. These are very large wetlands, and it is believed that just about all ILSF function as vernal pools. Many isolated vernal pools are smaller than this and can be certified, but will not meet the jurisdictional threshold. In these cases, if the pool is entirely isolated and not within 200 feet of a perennial stream, it is not protected by the WPA regulations. It may still be protected under other regulations though.

No published study looking at vernal pools and WPA jurisdiction has been done. However, it is likely that the majority of vernal pools occurring in Massachusetts fall under the jurisdiction of the WPA. For those that don’t, Title 5, the Surface Water Quality Standards, Forest Cutting Practices Act, and local by-laws typically apply. There is likely a very small number of functional vernal pools that do not qualify for protection in one form or another in the state.

#### A Question of Timing

If a wetland permit is applied for and there is a certified vernal pool on the parcel, the pool will be addressed in the permitting process, starting with a determination regarding jurisdiction over the pool. This represents vernal pool certification functioning as

#### Vernal pool definition

The Wetlands Protection Act Regulations define vernal pools as:

*“confined basin depressions which, at least in most years, hold water for a minimum of two continuous months in the spring and/or summer, and which are free of adult fish populations, as well as the area within 100 feet of the mean annual boundaries of such depressions, to the extent that such habitat is within an Area Subject to Protection Under M.G.L. c. 131, s 40 as specified in 310 CMR 10.02(1). These areas are essential breeding habitat, and provide other extremely important wildlife habitat functions during non-breeding season as well, for a variety of amphibian species such as wood frog (*Rana sylvatica*) and the spotted salamander (*Ambystoma maculatum*), and are important habitat for other wildlife species.”*

#### Confined basin depressions

For water to pond, there must be a basin present at some spatial scale, and the regulatory definition establishes no criteria for confinement. The “classic” vernal pool is an isolated puddle in the woods - a clearly defined basin. However, vernal pool habitat is quite varied, may be quite large or very small, and often the basin will have a fuzzy edge because of shallow depth or pit-and-mound topography, or may have inlets and outlets. These basins still meet the criteria of the definition. DEP policy 85-2 explains the allowance for non-permanent inlets and outlets in Isolated Land Subject to Flooding (ILSF), and is relevant to the definition of vernal pools.



it was conceived - identification of the habitat in advance of permit applications. Often the presence of a vernal pool comes to light during the permitting process though. If the issuing authority becomes aware of a vernal pool in a jurisdictional wetland at any time during the open hearing process, it should be protected with permit conditions that meet the performance standards for certified vernal pools (see discussion above, and refer to 310 CMR 10.53). Remember, certification is a means of overcoming the presumption that a vernal pool doesn't exist. If clear evidence of vernal pool function is presented or discovered by the issuing authority during the public hearing process, the presumption is overcome, just as though it had been certified. There is no language in the WPA regulations that prohibits protection of a vernal pool that is not certified prior to the filing of a Notice of Intent, but the *presumption* of existence is established only for a pool certified prior to filing [10.57(2)(a)4].

The one situation where timing of certification is relevant under the Wetlands Protection Act regulations is when vernal pools occur in Riverfront Area. For pools in RFA certified prior to the filing of a Notice of Intent, there is a strong "no adverse effect" performance standard (see below). For pools that are identified in RFA but not certified, there is still a "no significant adverse impact" standard applied to work that might affect a vernal pool.

### Performance Standards

There are performance standards at 10.57(4)(a) and (b) for vernal pools occurring in Land Subject to Flooding. Work may be permitted in vernal pool habitat if [it] "will have no adverse effects on wildlife habitat, as determined by [a wildlife habitat evaluation]" (procedures at 10.60). No amount of alteration of vernal pool habitat is allowed without a wildlife habitat evaluation because of the importance of vernal pool habitat (see 1987 Preface IV. B.). Therefore, projects should not be issued a permit without a wildlife habitat evaluation having been completed which demonstrates no adverse effects.

"No adverse effect" is a measure of a pool's ability to provide food, shelter, and migratory, breeding, and overwintering areas for amphibians, and food for other animals. No impacts are allowed that will alter the topography, soil structure, plant community composition and structure, and hydrologic regime resulting in a diminished capacity to provide the habitat functions listed above. Refer to the Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands by the DEP's Bureau of Resource Protection for a comprehensive look at wildlife habitat evaluations.

When vernal pools occur within 200 feet of a perennial stream, performance standards at 10.58 apply. The Riverfront Area is the jurisdictional resource area, so any vernal pool is covered, regardless

### Pool hydroperiod and "spring"

To salamanders and frogs, "spring" starts when environmental cues tell them it's time to breed. Within the regulatory context, though, vernal pools are defined by their hydroperiod - they "hold water for a minimum of two continuous months in the spring and/or summer..." In order to identify vernal pools for regulatory purposes, we therefore need a more firm beginning to "spring" in order to know when two months ends so that it's possible to evaluate whether a pool is holding water long enough to meet the definition. Therefore, "two continuous months in spring and/or summer" is measured from the vernal equinox (on or about March 20) through the autumnal equinox (September 22). A pool that doesn't hold for two continuous months between these dates in 3 out of 5 years does not meet the hydroperiod criteria of the definition.

### Presence of fish

Vernal pools provide important wildlife habitat *because they lack fish*. However, pools located in floodplains or that have connections to fish-bearing water in 100-year storm events (for example) will occasionally have fish present. Fish are also occasionally introduced to vernal pools. These non-breeding populations do not persist, though.

### Vernal pool landscape settings

Vernal pool habitat occurs in many different wetland types - not just in Land Subject to Flooding - and also in non-wetland (non-jurisdictional) settings. The definition of vernal pool habitat includes no restriction to any particular type of wetland; any misconceptions in this regard come from the fact that performance standards are only written for certain wetland types. The WPA regulations only protect pools that occur within jurisdictional wetlands, though.



of size or other characteristics. For pools in RFA certified prior to the filing of a Notice of Intent, “no project may be permitted...which will have any adverse effect...” [10.58(4)(b)] This is the same strict standard applied to rare species habitat. There is “no significant adverse impact” allowed for pools identified by a competent source but not certified. “Work shall not result in an impairment of the capacity to provide vernal pool habitat” [10.58(4)(d)1.c.].

The standards at 10.58 for pools occurring in Riverfront Area are also significant in that they allow protection of the wildlife habitat value of the upland surrounding a vernal pool within the Riverfront Area. The regulations discuss the importance of undisturbed woodland habitat surrounding vernal pools [10.58(1)], and require that the wildlife habitat value of the RFA surrounding vernal pools (including, and especially, upland) is not adversely affected.

What about vernal pools that are located in a forested swamp or other wetland setting? Performance standards for vernal pools only occur in the Land Subject to Flooding and Riverfront Area sections of the regulations (10.57 and 10.58, respectively). As noted above, the Wetlands Protection Act treats vernal pools much as it does other wildlife habitat features. Vernal pools occur in many different settings, including within many different jurisdictional wetland types. The performance standards at 10.57 should be applied to vernal pools occurring in any jurisdictional wetland, as adjudicated in *JanCo v. Foxboro* (Docket 97-069). It is likely, though not known, that nearly all vernal pools occur within a wetland that is under the jurisdiction of the Wetlands Protection Act.

### Vernal Pools and “Vernal Pool Habitat”

The vernal pool definition in the WPA regulations is often misinterpreted as providing a 100-foot buffer around certified vernal pools. Reading the definition at 10.04, that’s a logical conclusion to draw; it includes the clause: “as well as the area within 100 feet of the mean annual boundaries of [vernal pool] depressions ...” However, the second part of this statement is equally important: “... to the extent that such habitat is within an Area Subject to Protection Under [the Act].” The inclusion of the 100-foot “vernal pool habitat” zone is an acknowledgement of the importance of surrounding land to vernal pool dependent wildlife. However, WPA jurisdiction does not extend beyond the wetland boundary, so the 100-foot habitat zone is truncated at the wetland boundary.

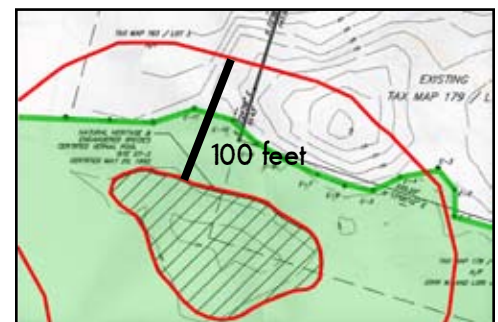
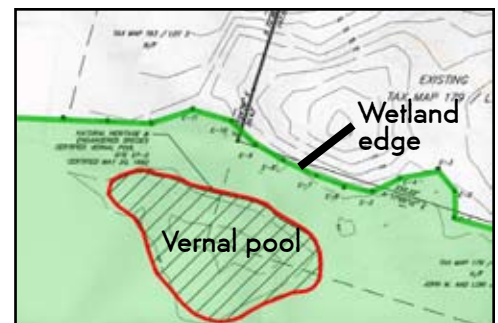
This points out an important shortcoming of protection for the landscape-scale ecological processes that are important to the long-term function of vernal pools and their wildlife. The wetlands protection model is inadequate for protecting the habitat needs of vernal pool amphibians throughout their life cycles, and is also unable to address landscape-scale connectivity that is critical to the functioning of vernal pools over the long-term.

### Performance standards

Performance standards are written for pools occurring in Land Subject to Flooding (310 CMR 10.57) and in Riverfront Area (310 CMR 10.58). However, vernal pools occurring in any jurisdictional wetland can be protected by applying the standards at 10.57. This was adjudicated in 1997 in *JanCo v. Foxboro* (Docket 97-069).

### Buffer Zones

There is no buffer zone for vernal pools under the WPA regulations. Protection never extends beyond the boundary of a jurisdictional wetland. The 100-foot “habitat” mentioned in the definition (310 CMR 4.00) exists because of the importance of the surrounding landscape to vernal pool wildlife, but it does not go out into non-jurisdictional upland areas.



## Boundaries

Establishing the boundary of a pool is of critical importance, of course, and there has always been a lot of debate and confusion over the correct approach and what the regulations prescribe. In isolated wetlands where volume and observations of flooding are used to determine the edge of the wetland, the edge of the vernal pool typically coincides with the wetland boundary. The regulations state that the boundary is that “certified” by the MDFW, and that in the event of a conflict of opinion, or the lack of a clear delineation the applicant may submit an *opinion* (emphasis added) as to its extent based on engineering calculations.

Vernal pools are protected because of their importance to wildlife. Therefore, ecological considerations should drive delineations. From an ecological point of view, the edge of standing water in the earliest part of the spring, when spotted salamanders and wood frogs first arrive at a pool to breed, is really the critical concern. The definition of the boundary of ILSF is “the perimeter of the largest observed or recorded volume of water confined in said area.” In most cases, this definition should be applied to the boundary of vernal pools. It accurately identifies the ecologically-significant edge of maximum high water. It is also easily identified in the field throughout most of the year using field indicators, even when standing water has receded or dried completely.

It is important to note that the Natural Heritage Program does not establish a boundary during the vernal pool certification process. The Program does not have regulatory authority over vernal pools, so the question of delineation and regulation is typically deferred to the issuing authority.

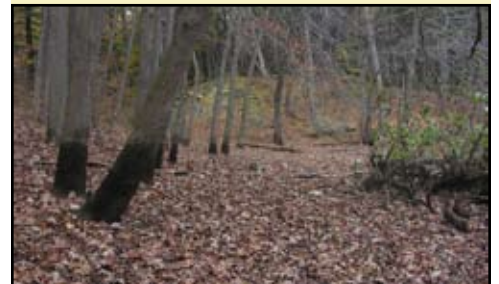
An applicant has a right to provide an opinion as to the extent of vernal pool habitat based on engineering calculations (10.57(2)(a)6 and (2)(b)3). A persistent and quite often significant error is introduced to these opinions by ignoring groundwater input. Though the extent to which groundwater contributes to vernal pool hydrology is entirely site-specific and can't be generalized, vernal pool catchments rarely could support observed maximum water volumes with no groundwater component. Therefore, any opinion based on engineering calculations that does not include groundwater input should be considered to grossly under-estimate the extent of maximum flooding. Spring-time groundwater measurements in the area immediately surrounding the pool should be required for any engineering calculations presented for the extent of vernal pool habitat. Ideally, an applicant will provide the issuing authority an elevation that can be marked in the pool and compared to field indicators of maximum flooding to ensure that the calculations show a reasonable extent.

## Two months is a threshold criterion

The regulatory definition of vernal pool habitat includes a hydrological criterion of holding water for two continuous months in the spring and/or summer of most years. This is occasionally misinterpreted to have relevance to delineation. Two months is a threshold criteria for qualification of a basin as a vernal pool. Delineation is an entirely separate question, and requires evaluating the maximum extent of flooding.



*Boundaries should be based on maximum spring-time flooding elevation because vernal pool wildlife arrive at pools early in the spring.*



*Even after water has receded, there is often clear evidence of the extent of flooding on plants and the ground. Water staining, plants, and soils all show evidence of extended flooding.*

## Boundary calculations

Groundwater is a significant component of the water budget of most vernal pools. Boundary opinions based on engineering calculations must include groundwater inputs to be considered reasonable and valid.



## Surface Water Quality Standards (314 CMR 4.00)

### Certification and Jurisdiction

The Surface Water Quality Standards are used to implement the federal Clean Water Act at the state level. When a project proposes alteration of a wetland that is under federal jurisdiction (we won't tackle those criteria here), a permit must be obtained from the Army Corps of Engineers before any solid or liquid fill is discharged. The process starts with a state Water Quality Certification issued under these regulations. Most vernal pools that meet certification criteria will also meet the criteria as federal wetlands. In fact, even pools that don't trigger WPA jurisdiction are typically jurisdictional under the federal Clean Water Act.

### Performance Standard

Under these regulations, Certified Vernal Pools are designated Class B Outstanding Resource Waters. No new or increased discharge of pollutants, including fill or storm water, is allowed in an Outstanding Resource Water, and any existing discharge must cease, or be treated with the highest and best practical methods.

### Boundaries

The federal wetland boundary should be considered the boundary of the pool for the purposes of applying these regulations.

## Title 5 of the MA Environmental Code (310 CMR 15.00)

### Certification and Jurisdiction

Any vernal pool that is certified at the time a permit application is submitted to the approving authority is protected by Title 5.

### Performance Standard

These regulations establish minimum requirements for the subsurface disposal of sanitary sewage (septic systems). They protect certified vernal pools by establishing setbacks from the edge of the pool for components of septic systems. Septic tanks must be sited at least 50 feet, and soil absorption systems (leach fields) and their reserves at least 100 feet from the edge of a certified vernal pool. The setback for the soil absorption system can be reduced if hydrogeologic data demonstrates that the pool is hydraulically up-gradient from the proposed system.

### Boundaries

No specific criteria are established for determining the boundary of certified vernal pools for these regulations.

### Federal trigger

A permit is required under the Federal Water Pollution Control Act for any discharge of dredge or fill material into a wetland under federal jurisdiction. Permit applications are sent to DEP and administered through the Surface Water Quality Standards. Where the water body involved in the action requiring a federal permit is a certified vernal pool, the standards at 314 CMR 4.00 are used.



# Forest Cutting Practices Act Regulations (304 CMR 11.00)

## Certification and Jurisdiction

Forest cutting plans are required for any commercial timber harvest in Massachusetts. Plans must be developed according to these regulations. Most forestry activities are subject to the Wetlands Protection Act, and therefore the regulations affecting timber harvest around vernal pools are triggered by Wetlands Protection Act jurisdiction.

There are a number of requirements established for harvest in and around Certified Vernal Pools. These apply to uncertified vernal pools as well, but are recommended “best management practices,” rather than having the force of regulatory requirements.

## Performance Standards

Within a certified vernal pool basin, no equipment is allowed to operate at any time of year. Treetops and slash should be kept out of the pool depression, but if any fall in a pool during the amphibian breeding season, they should be left if removal would disturb amphibian eggs or larvae.

Filter strips shall extend 50 feet from the edge of a certified vernal pool, within which no more than 50% of the basal area will be cut at any one time. The filter strip is extended up to 100 feet if slopes exceed 30%.

For all vernal pools, certified and uncertified, several best management practices are recommended. These include avoiding locating landings, skid roads, or haul roads in or near vernal pools. Soil compaction near vernal pools should also be avoided. It is recommended that machinery not be operated within 50 feet of vernal pools during mud season, and that ruts deeper than 6”, which can trap amphibians, not be left. The Standards above are recommended for all vernal pools.

## Boundaries

No specific criteria are established for determining the boundary of certified vernal pools for these regulations. However, the connection between these regulations and the Wetlands Protection Act regulations suggests that the same principles would apply.

## Filter Strips

Filter strips not only protect water quality of the wetland they abut, they also provide very important habitat for amphibians immediately following metamorphosis. Maintenance of adequate buffer strips around vernal pools makes a significant contribution to the biological function of vernal pool habitat.

## Treetops and slash in pools

If treetops or slash are dropped in a pool during the winter and not removed prior to ice-out, it's likely that they will be used as egg deposition sites by breeding amphibians. To avoid harming the development of any egg masses, material should not be removed from the pool between ice-out and early summer unless a thorough survey is conducted for egg masses.

