

# Recommendations for Pool-breeding Amphibian Surveys and Habitat Assessments



## Purpose

The Vermont Wetland Rules protect pool-breeding amphibian habitat. Pooling forested wetlands with no permanent inlets or outlets are presumed to be vernal pools and Class II unless an adequate breeding season survey indicates no amphibian breeding activity. When activities are proposed within 50 feet of a pooling wetland, wetland permitting requires the evaluation of the extent to which the wetland (aka vernal pool) supports or provides habitat to support the reproduction of uncommon pool-breeding Vermont amphibian species\* and how the project may affect that habitat. An evaluation cannot take place if the application lacks spring breeding and habitat condition information. It is therefore important that adequate evidence is collected during the spring breeding season. This document is intended to recommend appropriate ways to collect adequate data for the purposes of determining wetland significance (classification) and applying for a wetlands permit.

## Qualifications

Work must be conducted by a field biologist experienced in locating vernal pools. The biologist must be able to locate, identify, and quantify eggs of pool-breeding amphibian species, as well as identify the juvenile and adult amphibians.

## Amphibian Breeding Survey

- Timing the survey to the period in which local amphibians lay eggs in the pool is critical. Evidence of amphibian breeding in pooling wetlands can only be observed in the springtime. Surveys should occur after snow-melt and will generally be between mid-April and late-May, depending on location within the state and local conditions. Suitable conditions may be indicated by an early spring warm up after ground thaw for wood frogs, or nighttime rainfall events with air temperature of 42°F or above for spotted salamanders and other species.
- Care must be taken to not harm eggs or create unnecessary disturbance within the pool(s). Handling of egg masses should be limited to that necessary for identification and quantification.
- It is recommended that each pool be visited four times, with a week between visits, during the time when wood frog and spotted salamander egg masses are expected to occur in the pool. Repeated counts enable the determination of the maximum number of egg masses for each species for that year (may occur during different visits among species). A pool must be visited twice at a minimum, with at least a week between visits, during breeding season, in order to determine that amphibian use is absent.
- All amphibian egg masses within each entire pool should be counted and identified to species during each visit.
- Field surveyor should use polarized sunglasses, enter each pool as needed to view all parts of the pool, and not survey during rain (which obscures visibility).
- Grid systems may be used to keep track of individual egg masses within a pool over multiple visits. This can provide a more accurate estimate of the maximum number of egg masses through the season for a species, as some egg masses may become less visible (or hatch) and additional ones appear in the pool.
- A maximum number of egg masses for the season should be determined for each species present in each pool (abundance index).



- Photographs are to be taken of amphibian egg masses for each species encountered and of any other evidence of amphibian use.
- GPS points should be taken to indicate the pool location(s).

## Existing Conditions

- For permit applications, assess the condition of the pool(s), including such features as maximum size (area); maximum depth; size and maximum depth during each visit; prevalence of egg attachment structure (small limbs, twigs in the water column); presence of vegetation, hummocks, and trees within pool; and the vegetation and trees immediately surrounding each pool.
- It is helpful to assess and describe forest condition within 100 feet of the pool(s), indicating canopy cover, forest type, dominant tree species, and forest floor woody debris. At a minimum for permit applications, you must describe the forest condition within 50 feet of the pool.
- It is helpful to identify developed or disturbed areas, and the position(s) of these within 100 feet and 650 feet from the pool edge (this may be accomplished using aerial interpretation). At a minimum for permit applications, you must describe existing disturbances within 50 feet of the pool.
- Photographs are to be taken of the pool habitat during each visit and of representative areas surrounding the pool(s) that serve as non-breeding habitat.

## Maps

- The surveyed pool(s) and assessed habitat are to be mapped, showing location of study site, location(s) of pools surveyed, delineated extent of habitat assessment area, landscape features of importance to target species, and locations of other pools within 1300 feet of the on-site pool(s).
- The map should be overlaid on an ortho-photo of the project site with an indication of scale.
- If more than one pool is indicated on the map, these must be individually identified with labels.
- Location(s) of proposed impacts within 650 feet of each pool must be indicated on map(s).

## Impact Analysis (for applications)

- If pool-breeding amphibians are present, then analyze the potential impacts (such as contaminants, introduction of invasive species, disturbance to ground, vegetation, hydrology, or canopy) of the proposed project to each breeding pool.
- Indirect impacts should be included in evaluation of impacts. Examples include erosion and redirection of surface water runoff.
- Explore protective measures and design changes that avoid and/or minimize project impacts to pool-breeding amphibians and their habitats, and that mitigate such impacts.

\* Defined as any of the following species: boreal chorus frog (*Pseudacris maculata*), four-toed salamander (*Hemidactylium scutatum*), spotted salamander (*Ambystoma maculatum*), Jefferson salamander (*A. jeffersonianum*), blue-spotted salamander (*A. laterale*), and hybrids of the latter two species. The program is also interested in the use by wood frogs (*Lithobates sylvaticus*).

### Egg Survey Approximate Timing:

#### Wood Frogs: ~1-2 weeks after migrations

April 11 – 29 typical peak (range April 1 – May 9).

#### Salamanders: ~2-3 weeks after migrations

**Jefferson/Blue Spotted Salamanders:** April 11 – 24 typical peak (range April 4 – May 23)

**Spotted Salamander:** April 19 – May 22 typical peak (range April 18 – mid June).

~10 days later for dry spring (late migrations), late melting snow, deep snow, >3,000', NEK, north facing slopes, shaded sites  
~10 days earlier for Lake Champlain most years

Data adapted from Jim Andrews and Erin Talmage 2008, Lincoln; Rebecca Chalmers 2009-2014, Windham Co.; and Steve Faccio 2011 NPS report, Woodstock.