



## CAWS Vernal Pool Monitoring Program Protocol

1. Town staff shall be contacted prior to all monitoring inspections.
2. Monitors shall carry a “permission to access” letter, to be provided by the town, during all inspections.
3. It is recommended that inspections not occur on cloudy days, due to poor visibility, or if there was heavy precipitation in the past 24 hours, which can cause turbidity in the pools.
4. Pools shall not be inspected until they are ice-free to allow accurate egg mass counts.
5. Use of polarized sunglasses is strongly recommended to cut down on glare.
6. All monitored vernal pools, particularly those that are large and/or with dense vegetation, shall be thoroughly searched for egg masses.
7. It is recommended that colored flagging be hung on branches near egg masses that have been counted to avoid confusion with uncounted egg masses. All flagging shall be removed at the conclusion of the inspection.
8. It is recommended that hip waders and dip nets be cleaned with a bleach solution (4 ounces bleach to 1 gallon of water) following the monitoring inspections.
9. All data shall be recorded in a legible manner on the data sheets developed specifically for the monitoring program.

10. All original data sheets and any photographs, if taken, shall be submitted to CAWS at the conclusion of the monitoring season. It is recommended that the monitors keep copies of the data sheets for their records.
11. The following procedure shall be used to estimate the number of wood frog egg masses in a large raft where it is not feasible to count individual masses:
  - Divide the raft in half by draping flagging or similar across the surface of the raft. For large rafts it may be necessary to tie one end of the flagging to a branch or a dowel stuck into the pool substrate.
  - Repeat this subdividing procedure until you have created a subsection of the raft small enough to allow an accurate count of individual egg masses.
  - Count the egg masses in the subsection at least twice and average the results, then extrapolate to the entire raft. For example, an egg mass count of 20 in a one-eighth subsection would translate to a total of 160 egg masses in the entire raft.
  - Note that the raft may have a depth component, requiring a check for egg masses below the surface. Hands should be free of insect repellent when touching the eggs.

#### 12. Optional dip netting procedure

The monitors have the option of dip netting for fairy shrimp and marbled salamander larvae. The protocol for this activity is as follows: Four sweeps will be conducted at each of the four cardinal points (north, south, east, west) of the pool. The net will be drawn toward the monitor across the leaf litter on the pool bottom for approximately one meter. Sweeps should be spaced so as to collect representative samples at each cardinal point, and individual sweeps shall be separated by a distance of 3-5 meters

#### 13. Timing of inspections

Wood frogs are early, explosive breeders - eggs are typically deposited within a 5-8 day period. However, there may be site-specific variation due to microclimate conditions. Also, cold weather can temporarily interrupt egg deposition, extending the breeding season to 17 days or more. Wood frog eggs typically begin to hatch within 3± weeks of deposition.

Spotted salamanders have a slightly later and more protracted breeding season (19-29 days), and intact egg masses typically are typically present in vernal pools through April and into early May, with hatching beginning around mid-May.

In order to obtain accurate egg mass counts for these two species, two inspections shall be conducted at each pool:

- The first inspection will take place approximately two weeks following the first report of wood frog choruses in the general region of the pool. Wood frog egg masses will be counted during this inspection.

- The second inspection, in which spotted salamander egg masses will be counted, will occur approximately three weeks following the first inspection.

The monitors shall have the flexibility to adjust these guidelines in the event that cold weather interrupts or delays the wood frog or spotted salamander breeding season, or due to microclimate conditions at a specific pool. The goal is to count wood frog and spotted salamander egg masses when the majority of clutches have been deposited in the pools, but before they begin to hatch or decompose. Indicators that wood frogs may not have finished egg-laying include chorusing males, adults in the pool, and egg masses that appear to be more recently deposited than others in the pool. If any of these indicators are noted, the inspection should be postponed if feasible. If not, these indicators should be recorded on the data sheet.

Each pool will be inspected twice in the spring, even if only one “obligate” amphibian species has bred there in the past, since colonization or recolonization is possible.

14. Optionally, each monitor will annually inspect a reference pool and collect the same data that will be gathered at the “development” pools. The reference pool should be located on permanently protected land and satisfy the habitat and biological criteria for Tier I pools as outlined in the “Best Development Practices” manual (Calhoun and Klemens 2002).
15. Due to the potentially sensitive nature of the data collected in the program, under no circumstance will a monitor disclose, discuss or release it in any manner to the public. Data from the monitoring program will be periodically published or released in a formal manner. On these occasions any references to individual pools will be made by internal identification numbers, rather than by project names. Publicizing the names of individual projects that result in impacts to amphibian populations could jeopardize the future cooperation of landowners who are critical to its success.