

Municipal Vernal Pool Data Form



(for use by citizen scientists in town-wide mapping initiatives)

A Community Based Approach to Mapping Vernal Pool Resources



This set of slides was compiled to assist community volunteers in conducting vernal pool field assessments to document Significant Vernal Pools.

Slides are annotated to provide background information and guidance for each question on the Municipal Data Form.



Wood Frog



Spotted Salamander

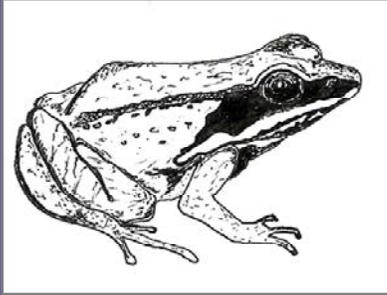


Blue-spotted Salamander



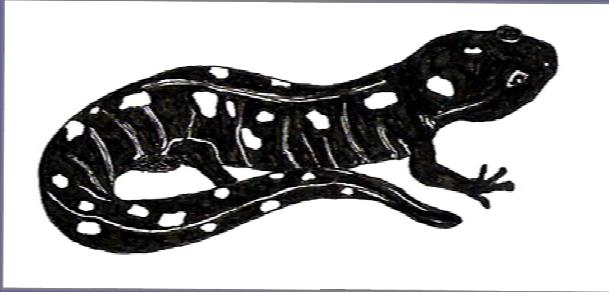
The animals dependent upon vernal pools for long-term breeding success are often lumped together in a single category of “vernal pool breeding amphibians,” despite their variation in reproductive timing and strategy. Wood frogs are sometimes referred to as “explosive breeders”, meaning that each year there is an “explosion” of activity that lasts for as little as a few days when mating and egg-laying occurs. Wood frogs are short lived in comparison to spotted and blue-spotted salamanders and tend to reproduce despite unfavorable weather conditions. With a longer lifespan, the salamanders tend to be more particular about waiting for ideal travel conditions for migrating to breeding pools, and as a result may arrive on rainy nights over the course of a few weeks (may be as long as 6 weeks) in the spring, or during very dry years, they may not breed at all.

1.



Wood Frog Visit

Date: _____



Salamander Visit

Date: _____

When surveying a vernal pool for egg masses, it is best to visit once, shortly after the peak breeding season for wood frogs, and then again roughly **two weeks later** once the salamanders have had a chance to arrive at the pool, mate and lay their eggs. You will be asked to visit each pool two times. During visit 1, the peak of wood frog breeding, you will record general information and count wood frog egg masses. Your second visit, roughly 2 weeks later will target peak salamander breeding. For each visit, **please count all egg masses for all species present**, even if you counted the same masses during a previous visit.

1.

Vernal Pool Phenology



Ice Out



First WF Chorus



Peak WF Chorus

First WF Egg Mass



SS Spermatophores



WF Egg Masses Complete



SS Egg Masses Complete

WF Egg Masses Hatch



SS Egg Masses Hatch



Although often lumped together as “vernal pool breeding species”, the reproductive strategies and schedule for each species are quite different. This phenology should help to point out the reason for two visits to each potential vernal pool.

1.

*Southern Maine*Vernal Pool Phenology*Northern Maine*

Ice Out

First WF Chorus

Peak WF Chorus

First WF Egg Mass

SS Spermatophores

WF Egg Masses Complete

SS Egg Masses Complete

WF Egg Masses Hatch

SS Egg Masses Hatch

Early April

Late April

Mid-Late April

Early-Mid May

Late April-Early May

Mid May-Early June

In addition to being influenced by the site location of the breeding pool and annual weather patterns, the timing of vernal pool breeding activity varies by region of the state. You may use this timeline to estimate the timing for visits to your pools.

2. Potential vernal pool number: _____



A potential vernal pool number (PVP) is assigned for each pool and may be found on your map.

3. Tax map number: _____



Property Ownership Number

The tax map number uniquely identifies property ownership for each parcel and should also be located on your map.

4. Volunteer Name _____

Phone Number: _____

Email Address: _____

It is recommended that you work in **pairs** to conduct field assessments. Please select the person most experienced with field data collection as the contact person. Provide their name, phone number and email address on top line of the data form.

5. Is PVP a vernal pool? YES NO
UNKNOWN UNABLE TO LOCATE



Aerial photographs are used to remotely identify wetlands that have the potential to function as vernal pools. Field assessments are required for confirmation. Many potential vernal pools (PVPs) identified in your town will in fact host vernal pool breeding species and be considered vernal pools. Some PVPs will not be vernal pools. They may be permanent bodies of water, or errors of interpretation. Please indicate on your data form if the PVP is a vernal pool, if it is not a vernal pool, if you are unsure, or if you are unable to locate the PVP marked on your map. On the back side of the data form there is room for comments and observations, please include notes that support your decision whether the PVP is or is not a vernal pool, why you are unsure, or if you are unable to locate the pool marked on your map.

THE FOLLOWING SLIDES INCLUDE EXAMPLES OF DIFFERENT SETTINGS/TYPES OF VERNAL POOLS.

Isolated Upland Depressions



Isolated Upland Depression

Pool within an isolated depression located in an upland deciduous forest. This is an example of a classic vernal pool typical of southern Maine and southern New England. Note the easily distinguishable and well defined perimeter.



Isolated Upland Depression

Pool within an isolated depression located in an upland coniferous forest. Pools may have very irregular margins.



Isolated Upland Depression

Sedge dominated pool within an isolated depression in Acadia National Park.



Sedge and fern dominated pool within an isolated depression in northern Maine.

Floodplain Depression



Floodplain Depression

Over bank flooding of the Penobscot river helps to fill a series of pool depressions within this floodplain forest.



Floodplain Depression

Expansive pool within a silver maple floodplain forest on the edge of a large river system. Pool depressions fill with water from over bank flooding from adjacent river, as well as from snowmelt and rainfall.



Floodplain Depression

Pools within floodplain depressions also occur along the margins of smaller streams.

Part of a larger
wetland complex



Pool in Larger Wetland Complex

Dominated by sphagnum moss, this pool is surrounded by a scrub shrub wetland.



Pool in Larger Wetland Complex

Vernal pools within forested wetland complexes can be difficult to identify because breeding habitat may consist of multiple small water-filled depressions in hummock and hollow microtopography which is typical of forested wetlands. Lacking a single discrete pool with well defined margins, in forested wetland complexes, trees grow on the hummocks and egg masses are often distributed throughout the numerous hollows.

6. PVP is not a vernal pool but it is a:

Farm Pond

Ditch

Tire Rut

Gravel Pit

Active Beaver Pond

Wetland too Shallow to be a Vernal Pool

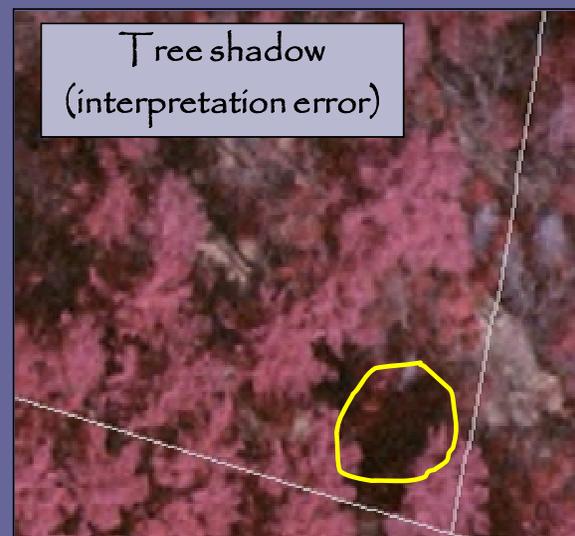
Other

Mistakes in photo interpretation often occur. The categories listed above and images you see in the following two slides are all examples of features that may look like a potential vernal pool on an aerial photograph, but upon closer inspection on the ground, are not vernal pools.

6. NOT vernal pools



Permanent Farm Pond



Tree shadow
(interpretation error)



Wetland in early spring that is too shallow to host species of vernal pool breeding animals



Tire ruts

When faced with pressures related to habitat fragmentation and loss of breeding habitat, vernal pool breeding amphibians may deposit their eggs in other available bodies of water such as ruts from timber harvest machinery, roadside ditches, abandoned gravel pits, beaver flowages, and artificial farm ponds. Smaller short lived bodies of water such as roadside ditches or the ruts remaining after a logging operation tend to dry up quickly, prohibiting the hatching and development of young. More permanent bodies of water such as beaver flowages, old gravel pits and artificial farm ponds often host predatory animals that dramatically reduce the survival rate of developing embryos and amphibian larvae.

Although egg masses may be found in these bodies of water, under the Maine state legislation, beaver flowages, roadside ditches, artificial farm ponds, skidder ruts, and abandoned gravel pits are NOT included in the definition of a Significant Vernal Pool.

Permanent Farm Ponds often host breeding populations of bull frogs and green frogs. Tadpoles of these two species overwinter in permanent ponds and prey heavily on vernal pool species.

Tree Shadows may in some situations look like dark water filled pools.

Wetlands too Shallow to be Vernal Pools are more difficult to judge. Even if a PVP holds very little water, it may still host vernal pool species (especially fairy shrimp). Make a complete survey even if at first glance a pool looks very shallow. It is also a good idea to make two visits to PVPs with low water levels, just in case it is a dry year and water levels are unusually low.

Tire Ruts may in some instances contain egg masses but are not vernal pools. Evaluate the site carefully to make sure the water filled ruts are not actually a continuation of an adjacent natural pool, as is the case in the photo above.

6. NOT vernal pools


 A photograph of a gravel pit, showing a steep, eroded bank of reddish-brown soil and gravel. The top of the pit is lined with green vegetation.

Gravel Pit


 A photograph of a ditch, showing a narrow, shallow channel of water flowing through a grassy area next to a gravel road. The water is dark and still.

Ditch


 A photograph of an active beaver pond, showing a large, calm body of water surrounded by dense evergreen trees. A large log is partially submerged in the water in the foreground.

Active beaver pond


 A photograph of a slow moving stream, showing a narrow, shallow channel of water flowing through a grassy area. The water is dark and still, with a large log partially submerged in the water.

Slow moving stream

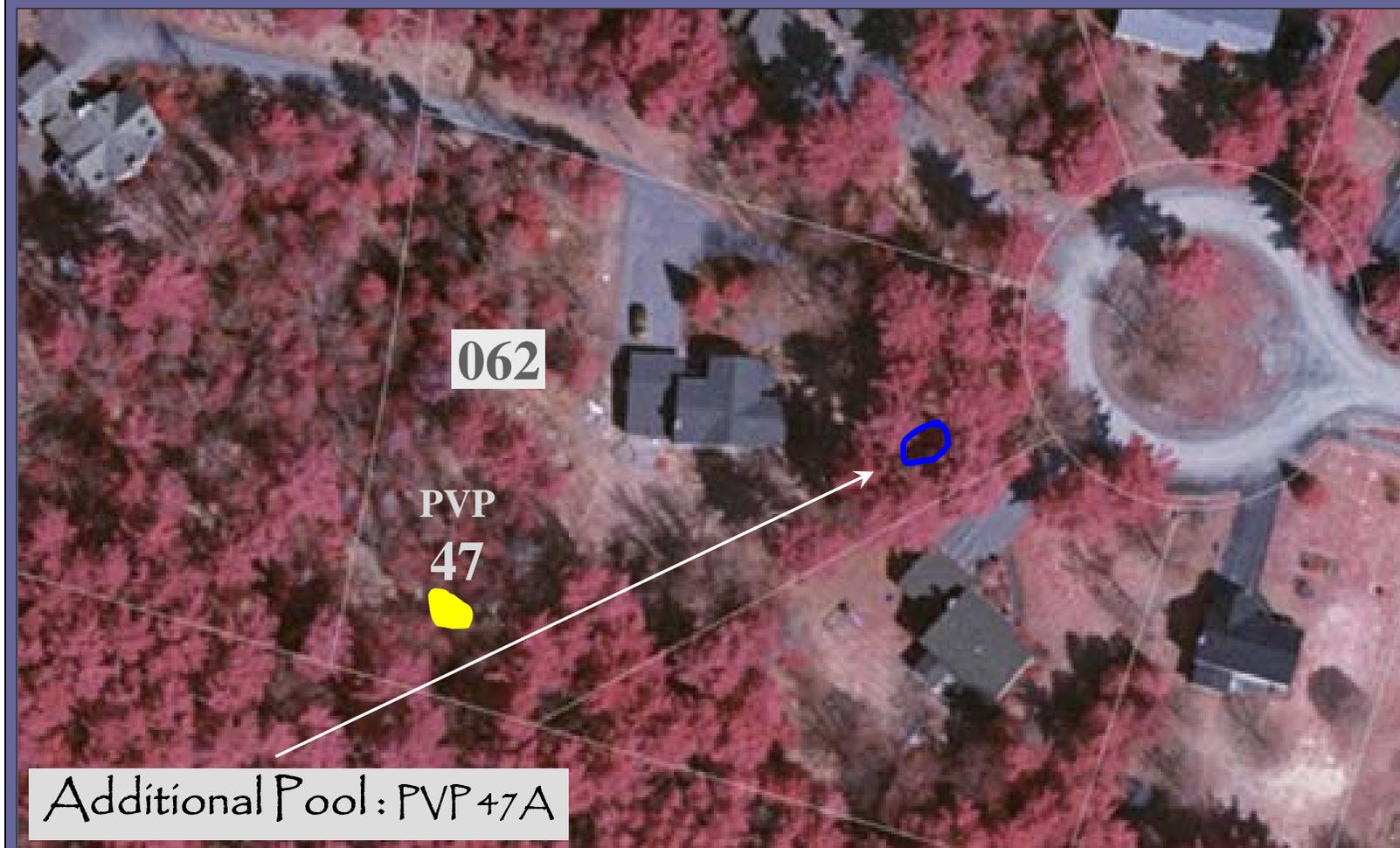
Abandoned Gravel Pits may contain the appropriate hydroperiod for successful breeding for vernal pool species, but are not naturally occurring and therefore are not regulated as Significant Vernal Pools.

Ditches may contain egg masses but are not natural and often dry up before juveniles emerge.

Active Beaver Flowages have in some parts of the state been documented to serve as valuable breeding habitat for wood frogs, but they are not regulated under the Significant Vernal Pool legislation.

Slow Moving Streams may provide suitable breeding habitat for some species, especially spotted salamanders, but are not regulated as Significant Vernal Pool habitat.

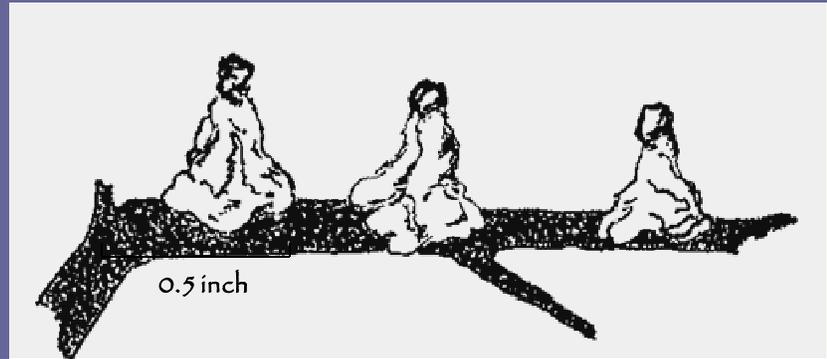
7. Pools found that were not marked on the map.



Because vernal pools are often small, ephemeral bodies of water that may be concealed beneath a dense tree canopy, some pools may not have been identified on the aerial photograph. Conversely, you may arrive at the location of a potential vernal pool and discover that it is not a pool at all. If you encounter additional pools, please mark their location on your map and fill out a separate data form for each one.

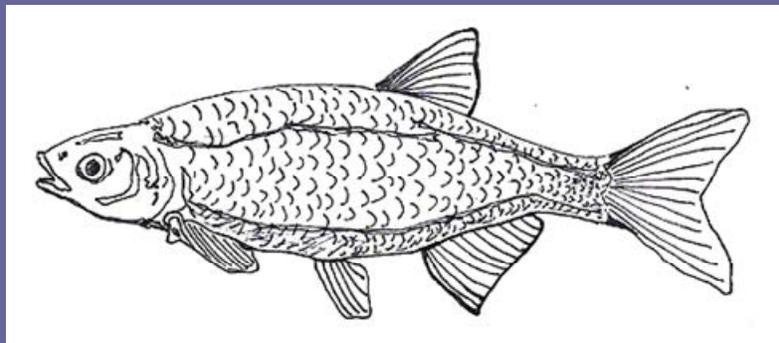
Label new pools by adding A, B, C, etc. to the number of the nearest PVP on the property (e.g., PVP 47A for an unmapped pool discovered in the near vicinity of PVP 47).

8. Are spermataphores present?



Male salamanders that breed in vernal pools deposit packets of sperm called spermataphores on the pool bottom, which are later picked up by females for internal fertilization. During a field assessment if you do not find any salamander egg masses, but spermataphores are observed attached to sticks or on leaf litter, this is an indication that salamanders breed in the pool, but you are too early to count their egg masses. A follow up visit should be scheduled.

9. Are fish present?



Long hydroperiod pools able to sustain populations of fish from year to year do not provide suitable habitat for the successful reproduction of vernal pool species and are therefore excluded from pools providing Significant Wildlife Habitat.

Do note that presence of fish does **NOT** necessarily mean that a wetland is not a vernal pool. In some cases fish may enter a pool during exceptionally high water, but will not survive pool dry down. Pools within floodplains that experience annual overbank flooding often contain fish.

Quietly approaching a pool with binoculars is the best way to spot fish swimming, or jumping at the surface of the water. If fish are present, it is important to note on the data form if the pool occurs within a river floodplain, or is adjacent to a larger permanent lake, pond, or wetland.

10. Condition of wood frog egg masses



Wood frogs often deposit their egg masses communally in large rafts that from a distance may appear as bubbles on the water surface.

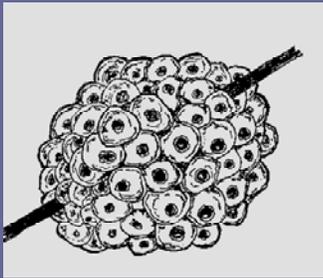
10. Condition of wood frog egg masses



Do be aware however that some wood frog masses may either be deposited, or get dislodged and come to rest on the pool bottom.

10. Condition of wood frog egg masses

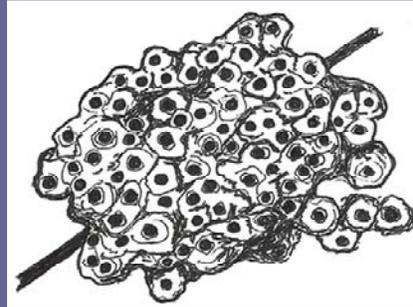
a. Firm, tight mass where individual eggs are spherical and easily discernable



Masses are easiest to count shortly after they are laid when eggs appear as tightly packed spheres and individual masses are easily discernable.

10. Condition of wood frog egg masses

b. Eggs are swollen with water and mass is beginning to break down



As days progress, the eggs absorb water, the embryos grow, and the jelly begins to disintegrate.

10. Condition of wood frog egg masses



c. Larvae hatched or hatching and egg mass is disintegrating



When tadpoles begin to hatch, egg masses have usually deteriorated to the point where distinguishing one mass from another is nearly impossible. Using the sketches on the data form as a guide, please indicate the condition represented by the majority of wood frog egg masses in each pool.

11. Was entire pool surveyed for egg masses?

If not, please explain why.

1st Visit

YES

NO

2nd Visit

YES

NO

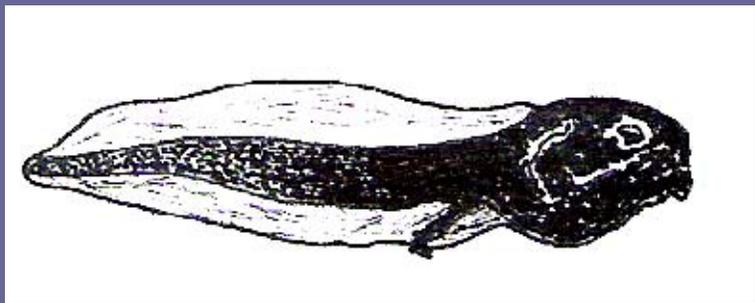
In this question please indicate whether the pool spans multiple properties and permission was granted to survey only a portion of the entire pool. Also note if you visited the pool but for some reason were not able to conduct a complete survey (ran out of time, were not prepared for size or depth, etc.)

12. For each visit, record the total number of egg masses for each amphibian indicator species.

	1st Visit	2nd Visit
Wood Frog Egg Masses		
Spotted Salamander Egg Masses		
Blue-Spotted Salamander Egg Masses		

For each species, indicate the number of egg masses counted. The total number of masses present should be recorded at each visit, even if they were counted during the previous survey.

13. Are larvae/tadpoles present?



1st Visit

YES

NO

2nd Visit

YES

NO



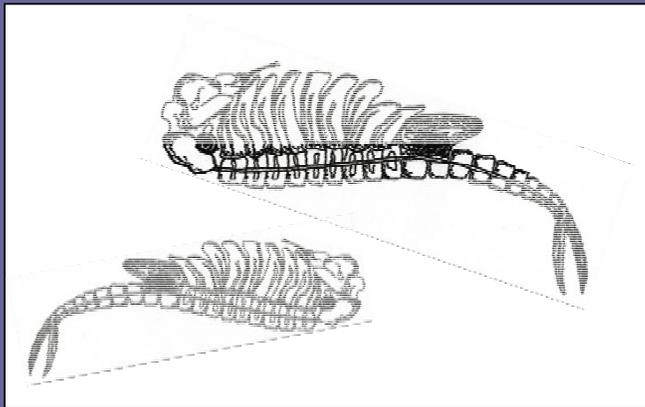
Salamander Larvae



Wood Frog Tadpole

While searching for egg masses, keep your eyes out for salamander larvae and wood frog tadpoles. Wood frog tadpoles lack the feathery external gills that are present in salamander larvae, but for the purposes of this data form it is not necessary to differentiate between the two.

14. Are Fairy Shrimp present?



YES

NO

YES

NO



While searching for egg masses, keep your eyes out for salamander larvae and wood frog tadpoles. Wood frog tadpoles lack the feathery external gills that are present in salamander larvae, but for the purposes of this data form it is not necessary to differentiate between the two.

15. General Comments and Wildlife Observations

Examples

- adult wood frogs present
- sandpiper feeding in shallows
- fish present (flood plain pool)
- possible ribbon snake (see photo)



- black duck nest
- mucky bottom (maybe long hydroperiod?)
- at second visit original pool had dried to form 3 smaller pools

Include comments about the pool, surrounding habitat, or additional wildlife observations. Note adult amphibians seen in and around pool. Please share any questions that you have or advice for volunteers that may be conducting follow-up visits. Provide photos of rare, threatened, and endangered species, including ribbon snakes, wood, spotted, or Blanding's turtles.

16. General comments and/or other wildlife observations.



Ringed Boghaunter Dragonfly



Spotted Turtle



Ribbon Snake



Blanding's Turtle



Wood Turtle

Rare, threatened, and endangered species, including ribbon snakes, wood, spotted, or Blanding's turtles, tend to most often be found in and around vernal pools during the summer months and are not likely to be present during spring time field assessments. However, if you do happen to encounter any of these state listed species, please include photographs with your completed data form. We are always interested in what visits vernal pools, note what birds are present, animal tracks that you see, etc.

16. Photo Documentation

Check photos taken for this pool

Visit # 1



Pool Overview



Wood Frog Egg Mass



Spotted Salamander Egg Mass



Blue-spotted Salamander Egg Mass



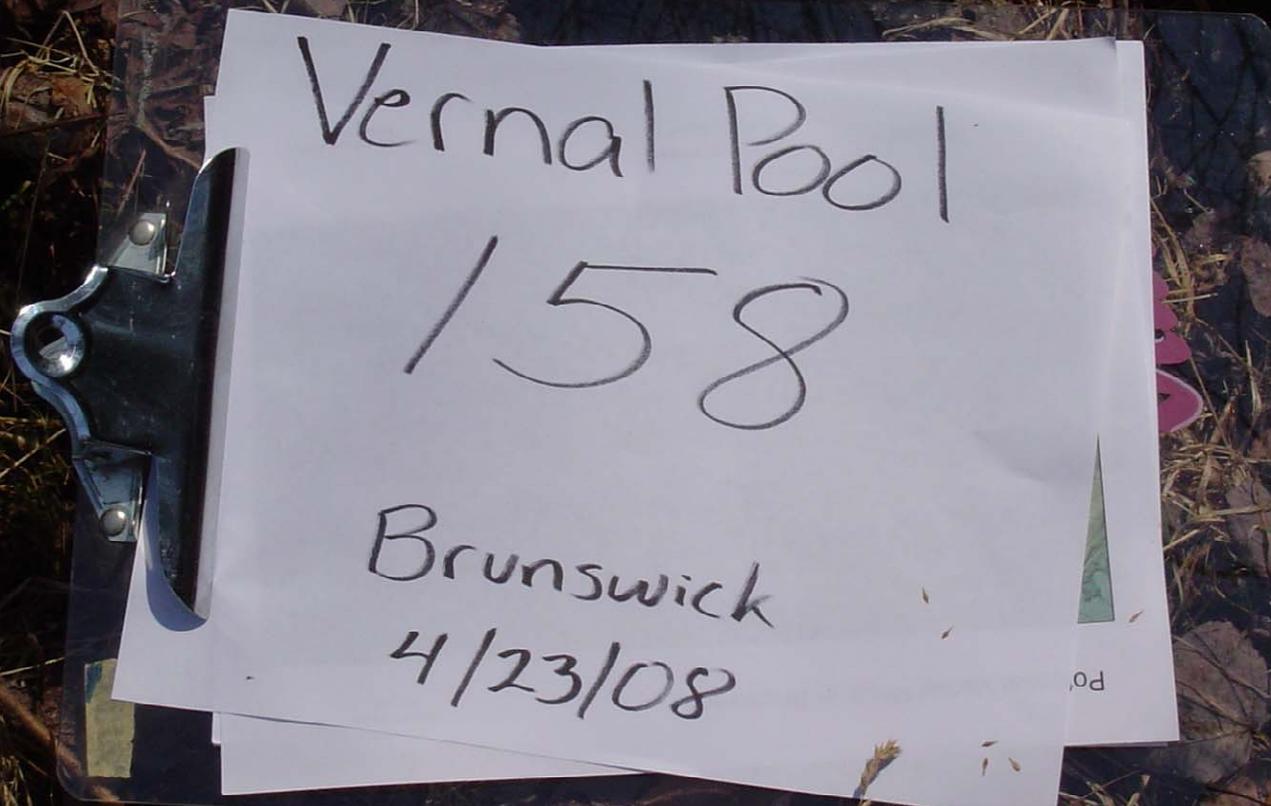
Fairy Shrimp

Visit # 2



Photographic documentation will be used to verify the observations recorded on each data form. For example, if you list wood frog egg masses you must have a photo of what you identified as a wood frog egg mass. Data forms filled out by trained volunteers **MUST** be accompanied by photographs for species identification and habitat verification. Towns are not able to accept data from citizen scientists without photo-documentation. If you do not have access to a digital camera, please try to borrow one, or team up with a volunteer that has access to a camera. Use this check list to record the photos that you take at each visit.

Tips for photo documentation

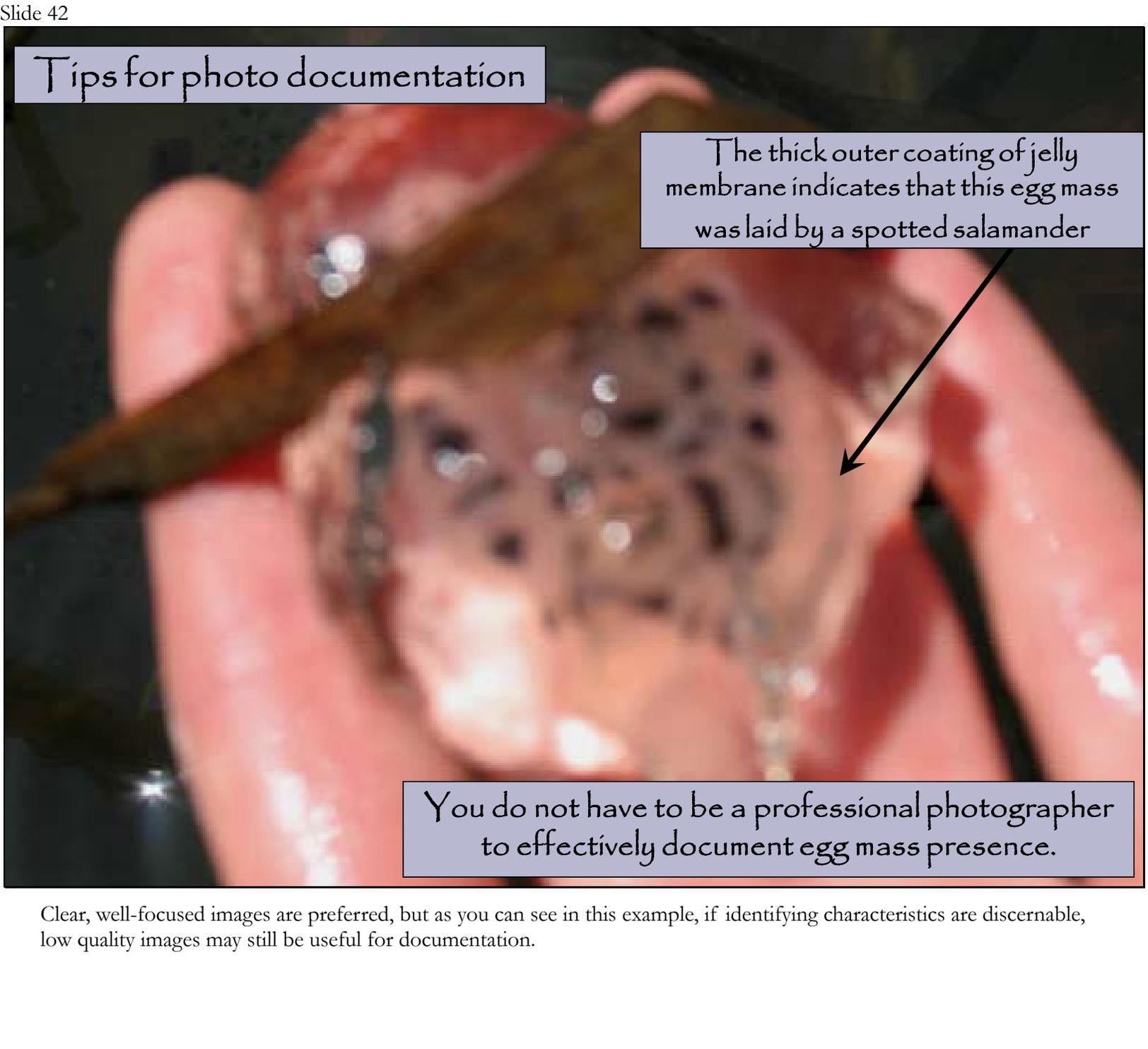


Photograph the PVP identification number written on a piece of paper prior to documenting site with required photographs

If you plan to conduct field assessments at multiple potential vernal pools in one day, you may find it useful to take a photograph of the identification number of each PVP prior to photographing the pool, surrounding habitat, substrate, and examples of egg masses present. This simple organizational technique will save you time and potential confusion when photographs are printed or downloaded.

Tips for photo documentation

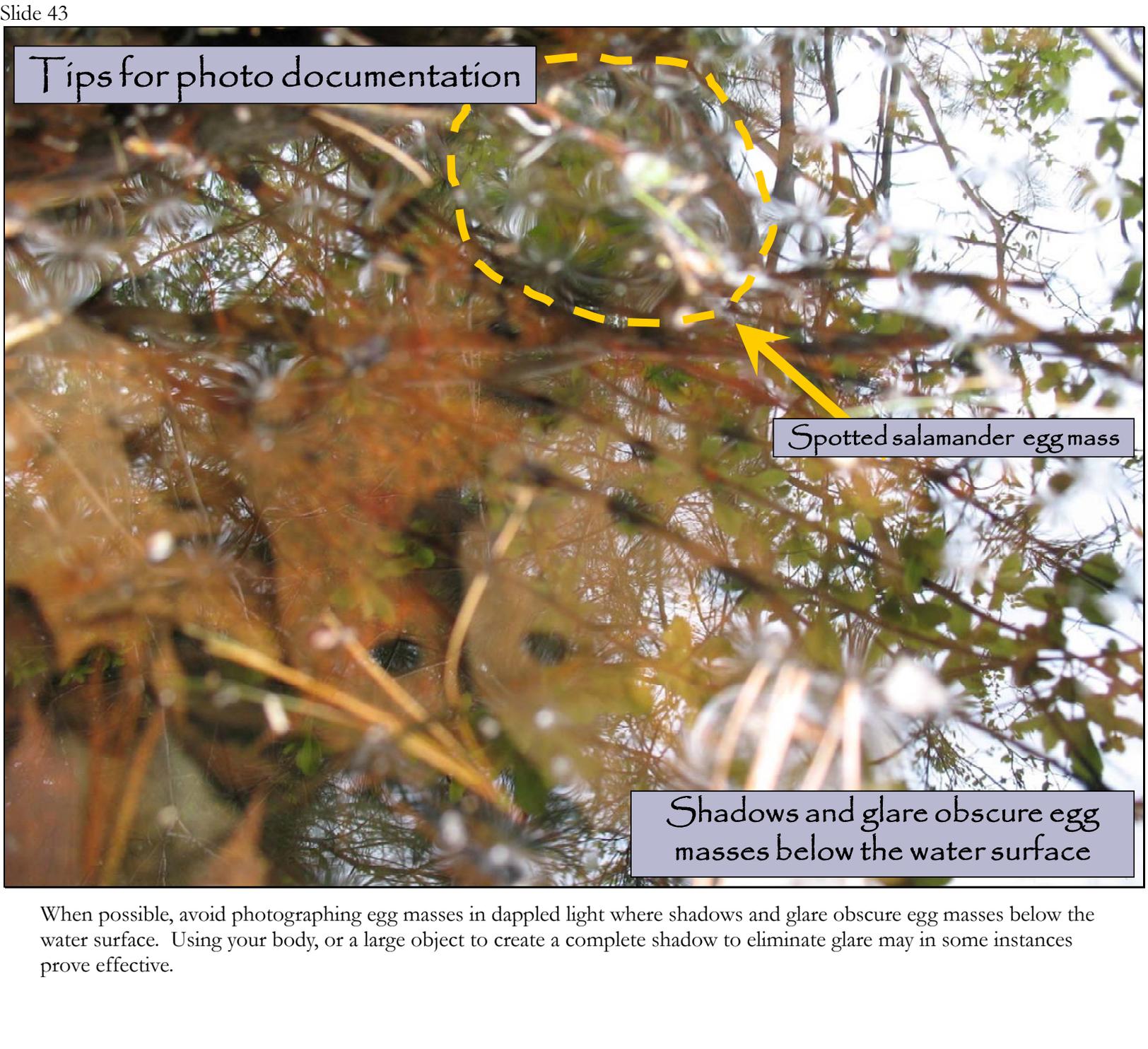
The thick outer coating of jelly membrane indicates that this egg mass was laid by a spotted salamander



You do not have to be a professional photographer to effectively document egg mass presence.

Clear, well-focused images are preferred, but as you can see in this example, if identifying characteristics are discernable, low quality images may still be useful for documentation.

Tips for photo documentation

A photograph of a stream with a spotted salamander egg mass. The egg mass is a cluster of small, white, oval-shaped eggs attached to a brown branch. A yellow dashed circle highlights the egg mass, and a yellow arrow points to it from the right. The water surface is dappled with sunlight and shadows, and there are many green leaves and branches in the background.

Spotted salamander egg mass

Shadows and glare obscure egg masses below the water surface

When possible, avoid photographing egg masses in dappled light where shadows and glare obscure egg masses below the water surface. Using your body, or a large object to create a complete shadow to eliminate glare may in some instances prove effective.

Tips for photo documentation



wood frog egg mass
below water surface



wood frog egg mass
at water surface

Photographs of egg masses show greater detail
if they are gently raised to the water surface.

You will find that it is often possible to gently lift egg masses to the surface of the water without removing them from their attachment site.

Tips for photo documentation



Please do not remove egg masses
from their attachment sites

Returning egg masses attached to vegetation to same location and depth in the water column is very difficult. Please do not remove egg masses from their attachment sites.

16. Labeling and Submitting Photographs

computer file name for digital photos

PVP44 Orono Morgan

photo names

 PVP44_BSSeggmass_Orono_Morgan_4-21-09.JPG
 PVP44_FairyShrimp_Orono_Morgan_4-21-09.JPG
 PVP44_PoolOverview_Orono_Morgan_4-21-09.JPG
 PVP44_SSeggmass_Orono_Morgan_4-21-09.JPG
 PVP44_WFeggmass_Orono_Morgan_4-21-09.JPG

For each pool, download and submit the images you checked (see previous slide) to a computer file folder. Record file names in format above. If you take more than one photo of the same subject, select your best image. **Please do not submit more than one photo for each species present.**

In the image name include:

the PVP #

(2) the subject of the photograph

(3) the town name

(4) your last name

(5) the date of survey

For each potential vernal pool that is visited, please include all images within a computer file folder with a name that reflects:

In order to assure an accurate assessment of egg masses and the presence/absence of fairy shrimp, each pool should be visited two times during the spring time breeding season. Photos for each of the two visits may be included within the same folder.

17. Future Access to Pool



Park in driveway (landowner enjoyed accompanying us during field survey). Make sure to invite again next year. No problem walking out through field then cutting through woods to pool. Landowner knew location well.

Include any notes that might be helpful for volunteers conducting assessments in future years.

FIELD GEAR

- 
- A photograph showing three people wading through a shallow, grassy vernal pool in a forest. The water is dark and reflects the surrounding trees. The people are wearing dark clothing and hats, and appear to be engaged in field research. The background is a dense forest of tall, thin trees.
- ✓ Datasheets
 - ✓ Map(s) of vernal pools
 - ✓ Gazetteer (optional)
 - ✓ Digital Camera
 - ✓ Clipboard
 - ✓ Rubber boots, waders, or sneakers and pants that can get wet
 - ✓ Cell phone
 - ✓ Binoculars (optional)
 - ✓ Polarized sunglasses (optional)
 - ✓ GPS unit (optional)

Vernal Pool Etiquette

- ✓ Please do not bring four-legged friends to your pools.
- ✓ Be sure your hands are bug-repellent and sun-lotion free.
- ✓ Walk slowly around the pool. Check the substrate. Mucky or solid?
If mucky, you may want to limit time in water to minimize your disturbance.
- ✓ Leave egg masses attached to vegetation or sticks. Photographs should be taken in place.
- ✓ Tadpoles, larvae, adults frogs and salamanders, and fairy shrimp can be temporarily removed from pool and photographed in a bucket