PENNSYLVANIA VERNAL POOLS

GETTING STARTED

FINDING POOLS

Vernal pools are by nature difficult to find. A simple method is to take nighttime walks or drives through the woods in the early spring months of March and April. The quacking chorus of wood frogs carries a good distance and is a sure sign a seasonal pool is nearby. If you live close to state owned lands, you might start with a call to the land manager or park naturalist. You can find larger seasonal pools on USGS 1:24,000 topographic maps. Mapping tools on the internet such as Google or Bing Maps have aerial maps that show great detail on the ground. Look for wetland areas that are not connected to streams or lakes such as isolated depressional wetlands in uplands, riparian areas, on slopes, and in forested areas.

Another source for finding potential vernal pools is the U.S. Fish and Wildlife National Wetland Inventory maps. Look for the following wetland types that may contain some seasonal pools (EPA 2005):

- PUB: Ponds, palustrine unconsolidated bottom
- POW: Ponds, palustrine open water
- PEM: Marshes and wet meadows (palustrine emergent)
- PAB: Palustrine aquatic bed
- PSS: Shrub swamps (palustrine scrub shrub)
- PFO: Forested wetlands (palustrine forested).

TIMING YOUR VISIT

The best time to visit a vernal pool is in the early spring when you have the best chance of observing the species mentioned above. Typically two or more visits are needed to a particular pond to catch amphibian movements, or to document a pool when it has water and when it is dry.

SAFETY

A few notes on how to be safe when visiting a vernal pool.

1) Wear protective clothing to ward off hungry mosquitoes and thorny or stinging plants. Insect repellant is a good measure to deter mosquitoes and ticks. West Nile Virus is a concern, but the mosquitoes that carry the virus are more commonly found in backyards, not backwoods.

2) Your first visit to a pool should be during the daytime. Be sure to have a compass or GPS unit with you to help you find your way. Instructions for how to find your way with

a map and compass can be found at the following USGS website: http://egsc.usgs.gov/isb/pubs/factsheets/fs03501.html

3) Walk the perimeter of the pool and note patches of briars, broken glass, or fallen logs. If you plan to sample in the pond, walk slowly and gently through the pond to determine the depth and condition of the substrate. Look for obstacles in the pond such as fallen logs, old tires, etc.

4) Do not walk on the ice of a frozen seasonal pool. Ground water often seeps into these pools and weaken the ice.

The Vernal Pool Association provides tips for teachers and students planning to visit a vernal pool pool to ensure a safe visit for both the humans and the animals they seek at http://www.vernalpool.org/vrntip00.htm

FIELD SURVEY EQUIPMENT AND SUPPLY LIST

Navigation and Safety: compass and GPS unit, maps, cell phone, flashlight, insect repellent, sunscreen, water, extra batteries, first aid kit

Data collection: clipboard, waterproof notebook or paper, pencil, vernal pool registry or scientific survey data sheets

Field Survey: rain gear, hip or chest waders (without felt soles), water proof bags, camera, binoculars, tape recorder, measuring tape or range finder, dip net, turkey baster, soft-tipped forceps, water / air thermometer, water chemistry equipment, disinfectant for gear, extra batteries, fishing license, other collecting permits if needed

Identification: field guides, hand lens or magnifying glass, white pan, specimen vials, plastic bags, clear jar

PROTECT THE VERNAL POOL ENVIRONMENT

Here are some basic measures to promote safe wading and handling of vernal pool critters:

- Rubber knee-high boots or hip waders with solid (versus felt) soles are the ideal foot gear. Make sure they are scrubbed clean and totally dry prior to visiting the site.
- All equipment including fish and dip nets should be scrubbed clean and totally dry prior to visiting the site.
- Hands should be washed to remove residual suntan lotion, insect repellant, etc.
- Stay out of the pool as much as possible, a lot of can be seen from the edge. When moving from place to place, get completely on dry land. The very shallow waters at the edge of a pool favored places for larval amphibians.
- If entering a pool is necessary, limit the number of people to one or two. Move slowly and carefully to avoid stepping on egg masses resting on the bottom and to minimize kicking up sediments

- Wet hands with pool water before handling animals and return them promptly to the water.
- Don't take animals or egg masses home or move them between pools.
- Egg masses can be lifted gently to the surface to inspect, photograph, etc., but it's best not to lift them out of the water. They might break apart, or if they are attached to a stick they might fall off.

EQUIPMENT CLEANING PROTOCOLS

Always clean and disinfect gear between sites to prevent spread of diseases and invasive species. There are an ever growing number of invasive species and diseases in Pennsylvania that can have devastating effects on native amphibian populations.

Two particularly troublesome amphibian diseases are ranavirus and chytrid. Ranavirus has been linked to massive die-offs in reptiles and amphibians including sites in Pennsylvania. Chytrid is type of fungus that contains many harmless species, but one species in particular (*Batrachochytrium dendrobatidis*, or '*Bd*' for short) infects the skin of amphibians and can lead to high mortality in some species. Here is a link to a map showing where *Bd* has been confirmed, zoom in on the map to see the sample points (http://www.bd-maps.net/maps/). In Pennsylvania, *Bd* has been confirmed at a few sites in the north-west and north-east, but an organized effort is needed to sample at many additional sites throughout the state.

Wear rubber-soled footwear when visiting streams and wetlands since it is difficult to properly disinfect felt-soled boots. See also the Pennsylvania Fish and Boat Commission's Biosecurity Measures for Commission Operations, Facilities, and Equipment (http://www.fish.state.pa.us/ais/pfbc_biosecurity.pdf) for more information.

Technique 1:

This technique works well if you are visiting a single site and won't visit another vernal pool site for a number of days.

Take your equipment home and scrub away loose dirt, vegetation, algae, etc. with soapy water. Let equipment dry completely at less than 70% relative humidity for a minimum of 48 hours. Equipment includes clothing and any sampling gear that comes in contact with the pool water.

Technique 2:

This technique is necessary if you are visiting multiple sites in a day or on subsequent days and don't have time to let gear completely dry out as in Technique 1.

- Take equipment away from the vernal pool or any other natural water body.
- Clean any equipment that came in contact with the pool water (nets, boots, etc.). Start by rinsing equipment with water and scrub away loose dirt, vegetation, algae, etc.

- Use a sturdy spray bottle to spray the equipment with a 50-50 household bleach-water mixture. Let stand for one minute.
- Rinse well with water.
- Spray equipment with a solution of sodium thiosulfate at 800 ppm solution (3 grams per gallon of water) to neutralize any lingering bleach. Sodium thiosulfate available online or from some pool supply stores*.
- Rinse well with water.

*Sodium thiosulfate available in SE PA at Buchmyer's Pools, 713 Arsenal Rd., York, PA 17406. Phone 717-757-2828; email http://www.buchmyerspools.com/

Technique 3:

Spray all equipment and waders that have contacted water with a 5% bleach solution and let it dry in the sun for approximately 5 minutes (plus the drying time while traveling between sites). In a recent paper (Bryan et al, 2009, Diseases of Aquatic Organisms 84:89-94), this was found to be the most effective method of preventing Ranavirus transmission.

FIELD GUIDES

We recommend use of the following guides to help you identify the reptiles, amphibians, and invertebrates that may be found in or near vernal pools. Note that these guides contain some species that may be uncommon, rare, or not found in PA. Consider photographing species you encounter and include them with your site documentation. Please take extra care not to disturb or harm vernal pool animals. It is especially important that you not take any vernal pool animals into captivity.

Brown, L. J. and R. E. Jung. 2005. An Introduction to Mid-Atlantic Seasonal Pools, EPA/903/B-05/001. U.S. Environmental Protection Agency, Mid-Atlantic Integrated Assessment, Ft. Meade, Maryland. The 'EPA 2005' publication can be downloaded from this website last accessed October 1, 2012: http://www.epa.gov/bioiweb1/pdf/EPA-903-B-05-001AnIntroductiontoMid-AtlanticSeasonalPools.pdf.

Hulse, A. C., C. J. McCoy, and E. J. Censky. 2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Cornell University Press, Ithaca, New York.

Kenney, L. P., and M. R. Burne. 2000. A Field Guide to the Animals of Vernal Pools. Massachusetts Division of Fisheries & Wildlife Natural Heritage & Endangered Species Program. Westborough, MA.

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