

Upper Susquehanna Coalition Vernal Pool Assessment and Monitoring Protocol



This vernal pool assessment form was developed through funds provided by the Environmental Protection Agency to establish a GIS user interface with the capability to not only integrate all of the vernal pool data throughout the watershed, but also to allow us to compile the data for modeling and study purposes. Developed in autumn of 2003, this user interface will allow a concerted data collection effort to take place throughout the watershed beginning in spring of 2004. This data is being collected as an educational tool related to both where pools are located throughout the Susquehanna River Headwaters, and what species are truly found here.

Contact Information:

Upper Susquehanna Coalition
Vernal Pool Program
851 Chemung Street
Horseheads, NY 14845
Phone: (607) 796-5378
Fax: (607) 739-4392
melissa@u-s-c.org
www.u-s-c.org/html/vernalpoolpage.htm



USC Vernal Pool Assessment Form

This Assessment Form comes in three parts. The first part collects General Pool Data.

Upper Susquehanna Coalition (Vernal Pool Assessment) - Part 1 (General Pool Data)

Site ID: Time Series: Lat: Lon: Date: Surveyor:

Time: Site Name: Owner: County: Town:

Tax Parcel ID: USGS Quad: DOQQ Quad: GPS Lat: GPS Lon: 11 Digit HUA #:

NWI Classification: PFO PSS PEM PUB None Other: Actual Classification: PFO PSS PEM PUB Other: 11 Digit HUA Name:

Pool Characteristics

Pool Type

Natural

Natural

Temporary Permanent Beaver Flowage Uncertain

Fish Presence

No Fish Minnows Predatory Fish (non-minnows) Unknown

Uncertain (not clear if natural or artificial)

Artificial

Artificial

Gravel Pit Roadside Ditch Tire Rut Farm Pond Other:

Fish Presence

No Fish Minnows Predatory Fish (non-minnows) Unknown

Artificial Pool Age

New (< 5 years old) Old (> 5 years old)

Water Depth (cm): Hydroperiod (if known):

Size

Estimated Measured Date Dry or Lowest Level:

Max. Width (m): Max. Length (m): Perimeter (m):

Estimated Spring Maximum: Calculated Area (m²):

Surrounding Habitat (Estimate % within 100 feet of pool)

Woodland: Hardwoods (> 75% deciduous) Softwoods (> 75% coniferous) Mixed (all others)

Woodland Overstory Density

Heavy (> 50% canopy cover of trees > 6 feet) Moderate (< 50% canopy cover of trees > 6 feet)

Open: Agricultural Fallow Other:

Residential: Roadside: Other:

Spring: Fall:

Summer: Winter:

Site Location:

upland-isolated bottomland-isolated Wetland Complex Vernal Pool Complex Existing Outlet to Pond

Level of Disturbance of Surrounding Habitat (within 100 ft buffer)

High Medium Low None

Type of Disturbance

Logging Development Garbage Brush Ditched Other:

Directions to Pool (250 character max.)

Part 2 Reset Form Help Capture Report Cancel

One of the benefits of using this tool is its ability to automatically fill data in based on the location of the point. Several of the fields on this first form are populated based on the location of the data point. Some of this data can be altered to fit the needs of the users, while other fields can not be changed.

Description of the Fields

Site ID: Site ID is one of those automatically populated fields that must be altered. The Site ID should begin with a V and be followed by the two-letter abbreviation of the county where the pool is found and end with a 5 digit sequential number. The Site ID shown in the image above is VCM00001 for vernal pool in Chemung County number 00001. There should be no duplication of the Site ID so coordination within the county is necessary. Site id field can not have any spaces in it.

Time Series: The Time series is a field that allows you to collect data at the same point many times by simply changing the contents of this field. We suggest using the data collection date as the time series id because it is something that is unique to each visit. For example, if you collect data at the site on 3/29/04, then you could use 3-04 or 3-29-04 as the time series. Time series can not have any spaces in it.

Lat/Lon: Latitude and Longitude are automatically populated fields that can not be altered. They are the calculated coordinates of the point location based on the standard UTM NAD83 zone 18 view.

Date: The Date field is automatically populated, however since it is filled in with the date of the data entry, we recommend this field be changed to record the data collection date.

Surveyor: Record the name of the surveyor(s) who collected the data.

Time: The Time field is automatically populated however since it is filled in with the time of the data entry, we recommend this field be changed to record the data collection time.

Site Name: Enter the name of the site if known. If unknown, the surveyor(s) should create a site name that is easily distinguishable and unique.

Owner: Enter the landowner's name if known. The owner of the property the pool located on is valuable information so that contact can be made for site visit permission.

County: This field is automatically populated and likely will not need to be altered.

Town: This field is automatically populated. However, check to see that the correct municipality is entered. Sometimes a village will be entered as the town in which it falls.

Tax Parcel ID: If the tax parcel coverage is loaded, this field will be automatically populated. Otherwise, enter the tax parcel id. It is beneficial to check the accuracy of this number. Some tax parcel GIS datasets can be older and contain incorrect data. The landowners will change over time but the parcel id number will not.

USGS Quad: Enter the name of the USGS 1:24,000 Topographic Quadrangle map if not already populated.

DOQQ Quad: This field is automatically populated with which quadrant the pool is located in, however you will need to enter the tile number - 0, 1, 2, or 3. See the theme list in the view for the tile information.

GPS Lat/Lon: If you have recorded the location of the pool based on your GPS unit you can enter that information here to facilitate your locating the pool again. Enter coordinates in decimal degrees (42.xxxxx) UTM NAD 83 zone 18.

11 Digit HUA #: This field is automatically populated and likely will not need to be altered. This is the 11 digit numerical code for the NRCS Hydrologic Unit Area, (watershed).

11 Digit HUA Name: This field is automatically populated and likely will not need to be altered. This is the name of the 11 digit NRCS Hydrologic Unit Area, (watershed).

NWI Classification: Often Vernal Pools are too small to appear on NWI maps, however if it is already mapped, record the current classification.

Actual Classification: If the classification appears to be incorrect, record the actual classification. Refer to Appendix A for NWI classifications.

Pool Characteristics

Pool Type: There are two possible types of pools, Natural or Artificial if it is unclear which of these the pool is, select Uncertain.

Natural pools: Natural pools that support breeding populations of vernal pool dependent species can be classified as either temporary, permanent, beaver flowages, or you may be uncertain.

Temporary: If the pool is known to dry up at one time during the year, or every several years (has a known hydroperiod), it can be classified as temporary.

Permanent: Pools are those that are not known to dry up. Although the typical definition of a vernal pool describes a pool that goes dry periodically, this project is mapping the presence of vernal pool-dependent species and where they are found. Therefore if the species are present, we want to map the pool.

Beaver Flowages: A beaver flowage is a small wetland created by a beaver dam that represents a unique type of vernal pool.

Uncertain: If you are unsure about the nature of the pool simply mark the **Uncertain** button

Fish Presence: Typically small pools will not have fish present, however if there do appear to be fish, note the type (**Minnows** or **Predatory**).

Artificial Pools: Artificial pools would describe a pool that was obviously created by some means other than natural.

Gravel Pit: Any depression where excavation has taken place whether soil, gravel, or sand.

Roadside Ditch: A breeding site for vernal pool-dependent species that occurs directly adjacent to a road. Most often from human-induced drainage ditches

Tire Rut: A breeding site for vernal pool-dependent species that occurs in a depression in a dirt road, logging or dug road, or off-road-vehicle (ATV) trail.

Farm Pond: A breeding site for vernal pool-dependent species that occurs in a functioning or abandoned pond constructed for watering livestock.

Fish Presence: Typically small pools will not have fish present, however if there do appear to be fish, note the type (**Minnows** or **Predatory**).

Artificial Pool Age: Estimate the age of the artificial pool. New would be a pool less than 5 years old. Old would be a pool that is 5 years or older. Talking with the landowner may provide clues as to the pools history. Look for forest types and tree sizes as clues.

Uncertain: Select uncertain if the origin of the pool can not be determined based on a site visit or through historical research.

Site Location: Site location describes the landscape position of the pool.

Upland-isolated: These vernal pools can be defined as headwater wetlands that are separate from other pools.

Bottomland-isolated: These vernal pools are located in river floodplains or stream bottoms and are separate from other pools.

Wetland Complex: These breeding sites for vernal pool-dependent species are located on the fringes of larger permanent wetlands.

Vernal Pool Complex: These vernal pools are located in either upland or bottomland landscapes, but occur in clusters or groups.

Existing Outlet to Pond: Note whether there is an outflow to the pond of any type (man-made spillway, natural swale where water exits). The typical definition for vernal pools state that there is no permanent outflow.

Level of disturbance of surrounding habitat: Surrounding habitat is defined as a 100 foot buffer around the pond. Measure or estimate the buffer zone.

High: A high level of disturbance would be characterized by evidence of recent logging activities (tree tops, stumps, skid trails), ATV or off-road vehicle presence, recent construction activities, livestock accessibility, agricultural workings (machinery, soil tilling, active crop fields), adjacent roadway (dirt or paved) or dumping activity.

Medium: A medium level of disturbance would be evidence of human activity (camping, picnic area, cabins), hiking trails, evidence of firewood cutting, fenced pasture for livestock, or any small scale soil disturbances.

Low: A low level of disturbance would be non-invasive agriculture (fallow or abandoned fields), abandoned structures, or basically no non-natural disturbances.

Type of Disturbance: Classify the disturbance within the 100 foot buffer if possible.

Logging: Evidence of recent logging (stumps, tree tops, skid trails).

Development: Recent building or road construction.

Garbage: Evidence of refuse dumping, (non-organic waste).

Brush: Evidence of dumping, (trees, brush, organic waste).

Ditched: Evidence of water draining, (ditches, drain tiles, pipes).

Other: Anything not included in list above.

Directions to Pool: Write out specific directions on how to get to the pool from the nearest intersection. Use obvious visual references. The maximum amount of text is 250 characters.

Water Depth: Water depth in centimeters measured at deepest point. May have to be measured in summer when dry or winter when frozen.

Hydroperiod: Hydroperiod describes how long the pool holds water and when the pool dries up. Enter the range of months that the pool holds water. For example November-July, or the dates if known, 12-3-03 to 7-11-04.

Date Dry or Lowest Level: This would be the date that the pool dried up.

Size: Choose the method of size description, either **Estimated** or **Measured**.

Maximum Width: Enter the maximum width of the pool in meters.

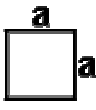
Maximum Length: Enter the maximum length of the pool in meters.


Perimeter: Enter the length around the perimeter of the pool in meters.

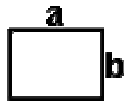
Estimated Spring Maximum: All measurements of pond size should be made in spring when the pool is filled to it's maximum level. If you are measuring the pool at another time of the year, estimate the maximum water level for your measurements and make not of it in this box. Enter "YES".


Calculated Area: Calculate the surface area of the pool. Estimate the general shape of the pool and use the following formulas to calculate the area in square meters.

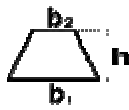
Area Calculation Formulas:

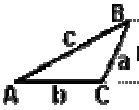
square = a^2 

circle = πr^2 

rectangle = ab 

ellipse = $\pi r_1 r_2$ 

trapezoid = $h/2 (b_1 + b_2)$ 

triangle = $(1/2) b h$ 

($\pi = \pi = 3.141592...$)

SOURCE: <http://www.math2.org/math/geometry/areasvols.htm>

Surrounding Habitat Estimate: Estimate the habitat types and percentages in the 100 foot buffer surrounding the pool. Enter the percentage out of 100 in the box adjacent to the category

Woodland: Enter the percent of the 100 foot buffer that is woodland or forest. Choose the dominant tree cover of that percent by clicking one of the three radio buttons.

Hardwoods: At least 75% deciduous trees.

Softwoods: At least 75% coniferous trees.

Mixed: Near a 50-50% mix of deciduous and coniferous trees, if they seem evenly mixed or any other forest type that is not deciduous or coniferous.

Woodland Overstory Density: Select the dominate overstory, either **Heavy** or **Moderate**.

Open: Select the primary form of open land from either **Agricultural** – Currently being farmed, or **Fallow** – Not in current production but still open. If you select **Other** describe the type of open land in the box provided.

Residential: Enter the percent of the 100 foot buffer that is currently a landuse that can be considered lawns and houses.

Roadside: Enter the percent of the 100 foot buffer that includes road ditches and roads

Other: When selecting **Other**, include a brief description in the box provided.

If you are entering data into the computer, and have pictures of the pond the **Spring, Summer, Fall, and Winter** this monitoring form allows you to create links to those pictures from elsewhere in the computer. When writing reports the pictures will be automatically included.

The Capture Report button allows the computer user to save an image of the completed form for use in other projects.

The second and third parts of the Vernal Pool Assessment forms collect Pool Sampling Data.

Upper Susquehanna Coalition (Vernal Pool Assessment) - Part 2 (Pool Sampling Data)

Surveyor:

Date Time

Weather
 Sunny Partly Sunny Overcast Rain Snow Air Temperature (F):

Water Level
 Full 3/4 Full 1/2 Full 1/4 Full < 1/4 Full or Dry Ice Thickness (cm):

Water Chemistry
 Water Temperature (F): (C): Depth (cm): pH:
 DO: Conductivity: Nitrates: Chlorides: Phosphorus:

Plant Cover within Pool (estimate %)
 Trees: Shrubs: Branches/Twigs: Other:
 Emergent Vegetation: Floating Vegetation: Submergent Vegetation:
(grasses, cattails, pickeral weed)(water lilies, duckweed, etc.) (vegetation submerged at egg-laying)

Egg Attachment Sites (rate from most (1) used to least (6))
 Live Woody Branches: Dead Wood: Grasses/Sedges:
 Leaves: Artificial Structure: Other:

Upper Susquehanna Coalition (Vernal Pool Assessment) - Part 3 (Pool Sampling Data)

Indicator Species	Adults	Vocalization	Amplexus	Spermatophores	Egg Masses	Tad/Larvae	Identified in Hand	Photos (ID)
Wood Frog	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Spadefoot Toad	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Spotted Salamander	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Blue-Spotted Salamander	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Jefferson Salamander	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Unidentified Mole Salamander	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fairy Shrimp	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Facultative Species	Adults	Vocalization	Egg Masses	Tad/Larvae
Spring Peeper	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gray Tree Frog	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Green Frog	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Leopard Frog	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pickrel Frog	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
American Toad	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fowler's Toad	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Four-toed Salamanders	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Red-spotted Newt	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Spotted Turtle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wood Turtle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Blandings Turtle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Painted Turtle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Snapping Turtle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Indicator Species - Photo Information

Wood Frog

Spadefoot Toad

Spotted Salamander

Blue-Spotted Salamander

Jefferson Salamander

Unidentified Mole Salamander

Fairy Shrimp

Facultative Species - Invertebrates

<input type="checkbox"/> Leech	<input type="checkbox"/> Caddisfly Larvae
<input type="checkbox"/> Predacious Diving Beetle	<input type="checkbox"/> Fingernail Clams
<input type="checkbox"/> Water Scorpion	<input type="checkbox"/> Amphibious Snail
<input type="checkbox"/> Dragonfly Nymph	<input type="checkbox"/> Other <input type="text"/>
<input type="checkbox"/> Damselfly Nymph	<input type="checkbox"/> Other <input type="text"/>
<input type="checkbox"/> Dobsonfly Larvae	<input type="checkbox"/> Other <input type="text"/>
<input type="checkbox"/> Whirligig Beetle Larvae	

Comments/Observations of other wildlife species (250 Char. Max.)

The data collected by these forms may change with each visit. Our protocol requests that this data be collected at least once for each pool, additional data collection efforts may be undertaken to expand the database using the Timeseries function on Part 1 of the assessment form. Parts 2 and 3 can be filled out while only entering a new Timeseries name in Part 1.

Part 2 Compiles Chemistry and Vegetation Data for the Pool

Surveyor, Date, Time, Weather, and Waterlevel should be collected with each data collection for the purposes of fully understanding the data at a later date.

Water Chemistry: Water quality information is helpful for determining the health of the vernal pool. If you have access to a water sampling lab or machine, enter as much data as is available in the following data in this section:

Water Temperature: in the appropriate box record the degrees Fahrenheit or degrees Celsius

Depth: Record the depth of the deepest part of the pool in centimeters

pH: Record the pH of the pool

D.O.: Record the Dissolved Oxygen levels of the pool in milligrams per liter [mg/L]

Conductivity: Record the Conductivity of the pool

Nitrates: Record the Nitrates reading of the pool

Chlorides: Record the Chloride reading of the pool

Phosphorus: Record the Phosphorus reading of the pool

Plant Cover within Pool (estimate %): Estimate the percentage of cover provided by the following cover types in the pool:

Trees: Estimate the percentage of cover provided by trees growing within the pool boundaries.

Shrubs: Estimate the percentage of cover provided by shrubs growing within the pool boundaries.

Branches/ Twigs: Estimate the percentage of cover provided by branches and twigs located in the pool.

Emergent Vegetation: Estimate the percentage of cover provided by emergent vegetation (herbaceous plants growing up out of the water such as grasses, cattails, and pickerel weed) within the pool boundaries.

Floating Vegetation: Estimate the percentage of cover provided by floating vegetation (herbaceous plants floating on the surface of the water including water lilies and duckweed).

Submergent Vegetation: Estimate the percentage of cover provided by submergent vegetation in the pool.

Other: If there is a significant amount of cover provided by an unlisted medium, record the percentage of cover and a brief description of that cover type in the box provided.

Egg Attachment Sites (rate from most (1) used to least (6)): Spotted Salamanders and Wood Frogs are two predominate vernal pool species that generally choose to attach their egg masses to some submerged medium. Rank the egg attachment sites used by the species breeding in the pool based on the numbers of egg masses attached to each medium.

Live Woody Branches: Living branches of trees or shrubs that are submerged

Dead Wood: Including branches and twigs that have fallen into the pool

Grasses/ Sedges: Herbaceous plants

Leaves

Artificial Structures: Including garbage and other man-made mediums

Other: For any unlisted medium record the ranking and a brief description in the box provided.

Part 3 Compiles Biological Data from the Pool

An amphibian and reptile field guide is required for this section.

Data can be recorded by either noting the presence of the signs, or, if possible, by recording numbers of each that are seen.

Indicator Species – Photo Information: This monitoring form allows you to create links to any pictures you may have taken from elsewhere in the computer.

Comments/ Observations: Record all of your comments in this space provided.

By clicking on the **Write Report** button the data will be formulated into an html file or a word file as specified by the user. Linked pictures will automatically be included.