Hanover Conservation Commission
Vernal Pool Inventory Protocol
J. Kennedy 03/25/22

2022 Protocol for Vernal Pool Inventory in the Town of Hanover

1. Background: As part of the Open Space planning effort initiated in 2018, existing wetland and vernal pool data will be updated. We have created mapping and associated data files to assist in this effort. As we traversed the recently acquired Mink Brook Community Forest, we discovered many potential vernal pool locations, and identified them for future inventory. New Hampshire DES and the US Army Corps of Engineers require extensive documentation and evaluation of vernal pools for regulatory purposes. In Hanover, we have developed a more simplified methodology with this protocol.

2. Preparation for field inventory: As we approach the spring field season (best times are late April and early May), we must be careful to avoid duplication and to respect property rights. The Biodiversity Committee of the Conservation Commission will have lists and maps of potential pool sites, and will organize the field inventory effort. Before going out in the field, the following will be needed (see also the Harris Center Volunteer Handbook):

a. Property access and Permission: Before going out to field sites, make sure that you have property owner written permission, and that you park and access the sites from approved locations. On Town lands, you will need to sign a hold harmless agreement, available at the town offices.

b. Maps: The Commission can provide you with LiDAR-generated topographic maps if requested. Alternatively, you can use trail maps, natural area mapping from conservation organizations. Another good source of mapping is the NH GranitView website granit view . Zoom in to Hanover, then pull up Layers/Elevation/LiDAR contours and also Elevation/Topography/LiDAR-base bare earth hillshade. Amazing!

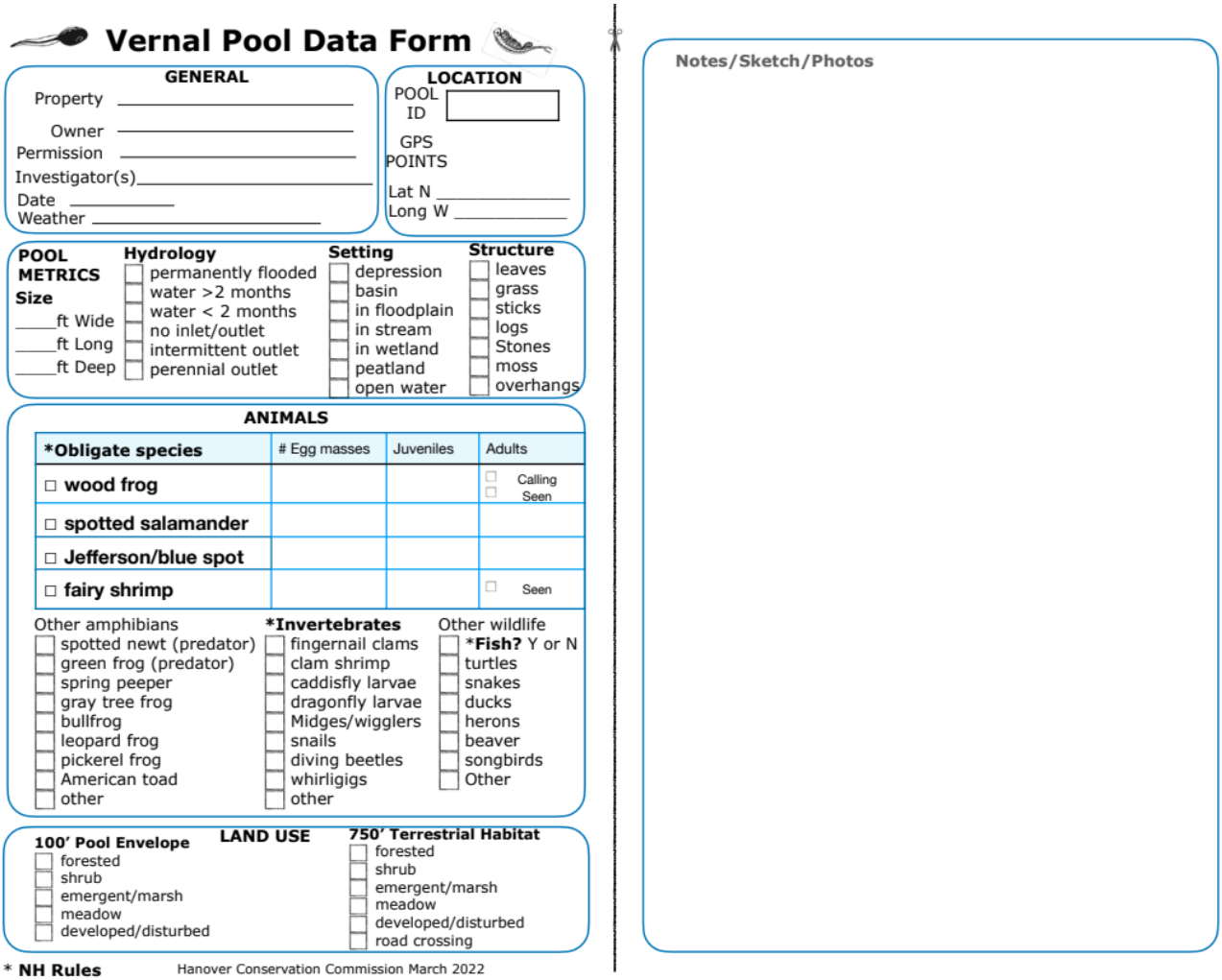
c. GPS: You can use a cell phone with GAIA GPS for most of this work. The phone and synchronized desktop app are free, and come with a great base map showing contours and trails. Contact https://www.gaiagps.com/ for more information. In any case, setting waypoints with latitude and longitude in decimal degrees is important. As an aid to locating the pools, the Commission can supply waypoint files to load into GPS units. You can also use a hand-held GPS mapping unit, such as the Garmin 64S or similar units.

d. Equipment: Waterproof footwear is a must. Polarized sunglasses help cut glare. A dip net or even a food strainer can be used to examine aquatic life. A 10-power hand lens and a measuring tape are also helpful. A cell phone camera can be used for documentation, but don't take too many photos. Bring survey flagging and a Sharpie to mark the data points using the numbering system assigned by the Commission.

e. Organization: The Commission and the Biodiversity Committee chair will maintain a list of sites and volunteers assigned to those sites. Please follow their directions.

f. Data Entry: The field sheets will be collected and the data will be entered into a GIS system and our database. The data can then be summarized, tabulated or charted in any number of formats.

3. Hanover Conservation Commission Vernal Pool Data Form: There are several state and federal data forms available, and many conservation organizations have developed field forms. In Hanover, we have developed a single-page field book size data form which combines many of the features of the other data forms, but is more tailored to our data collection program and the NH Vernal Pool regulations. The form is available from the town website, and is shown below:



Vernal Pool Data Form

GENERAL
Property _____
Owner _____
Permission _____
Investigator(s)_____
Date _____
Weather _____

LOCATION
POOL ID ☐
GPS POINTS
Lat N _____
Long W _____

POOL METRICS
Size
____ft Wide
____ft Long
____ft Deep

Hydrology
☐ permanently flooded
☐ water >2 months
☐ water < 2 months
☐ no inlet/outlet
☐ intermittent outlet
☐ perennial outlet

Setting
☐ depression
☐ basin
☐ in floodplain
☐ in stream
☐ in wetland
☐ peatland
☐ open water

Structure
☐ leaves
☐ grass
☐ sticks
☐ logs
☐ Stones
☐ moss
☐ overhangs

ANIMALS

*Obligate species	# Egg masses	Juveniles	Adults
☐ wood frog			☐ Calling ☐ Seen
☐ spotted salamander			
☐ Jefferson/blue spot			
☐ fairy shrimp			☐ Seen

Other amphibians
☐ spotted newt (predator)
☐ green frog (predator)
☐ spring peeper
☐ gray tree frog
☐ bullfrog
☐ leopard frog
☐ pickerel frog
☐ American toad
☐ other

***Invertebrates**
☐ fingernail clams
☐ clam shrimp
☐ caddisfly larvae
☐ dragonfly larvae
☐ Midges/wigglers
☐ snails
☐ diving beetles
☐ whirligigs
☐ other

Other wildlife
☐ ***Fish?** Y or N
☐ turtles
☐ snakes
☐ ducks
☐ herons
☐ beaver
☐ songbirds
☐ Other

LAND USE

100' Pool Envelope
☐ forested
☐ shrub
☐ emergent/marsh
☐ meadow
☐ developed/disturbed

750' Terrestrial Habitat
☐ forested
☐ shrub
☐ emergent/marsh
☐ meadow
☐ developed/disturbed
☐ road crossing

* **NH Rules** Hanover Conservation Commission March 2022

Notes/Sketch/Photos

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Item	Metrics	Example	Database Field
GENERAL			
Project	Name of project or property	Mink Brook Community Forest	VP_project
Owner	Name of owner	Town of Hanover	VP_owner
Permission	Make sure you have permission	Verbal, written, e-mail	
Investigator	Name of inventory person	J. Kennedy	VP_inv_by
Date	Date (s) of site visits	4/1/21	inv_date
Weather	Brief description	Sunny, warm, windy	
LOCATION			
POOL ID	Project-section- number	MBCF-SE-04	**VP_CODE**
GPS point	Note waypoint number or letter(s) (do the same on your field map)	208, ABC	GPS_point
Latitude/Longitude	Decimal degrees - 5 places from GPS unit, cell phone	43.56789 –72.65432	VP_lat VP_long
POOL METRICS			
Size	Pool length in feet width in feet max depth in decimal feet	50’ 15’ 0.75’ (9 inches)	VP_len_ft VP_wid_ft VP_dep_ft
Hydrology	Permanently flooded Flooded then dry after 2 months Flooded less than 2 months No inlet/outlet Intermittent outlet Perennial outlet	What’s happening with the water – check boxes	VP_hydro
Setting	depression or basin In floodplain in seasonal stream in wetland	Where the pool sits on the landscape – check boxes	VP_setting

	in peatland open water		
Structure	leaves grass/marsh plants sticks logs stones overhangs	Nesting and hiding sites in the pool – check boxes	VP_struct
Land Use	100-foot Vernal Pool Envelope – the most important protection area		VP_100
	750-foot Terrestrial Habitat – species will use this area in non-breeding times		VP_750
	forested shrub emergent/marsh meadow developed/disturbed road	Check boxes	
Quality	Determined after all inventory work is completed. USACE has a complex point system, Maine has significance thresholds, etc.	None Low Medium High	VP_quality

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Primary Indicators * very important! These are what define a Vernal Pool* (USACE obligate species)	Count the egg masses divide large pools into quadrants Fairy shrimp observed (note presence/absence)	WoFr/25 em SpSa/10 em JeSa/5 em FaSh - yes or no	WFEM_no SSEM_no JSEM_no FaSh_obs
Secondary Invertebrate Indicators (USACE facultative species)	fingernail clams caddisfly larvae clam shrimp aquatic beetles whirligig beetles dragonfly/damselfly larvae snails fly midges	Check the boxes Best guess – caddis cases, clams are small and hard to spot. Use dip net if time allows	VP_invert
	spotted newt (everywhere) green frog (predator) spring peeper (not a v.p. species) gray tree frog bullfrog leopard frog pickerel frog American toad (everywhere) other		VP_amphib
	Fish observed or not	No fish	fish_obs
	Other wildlife: turtles snakes ducks herons beaver songbirds other	Check the boxes	VP_wild
LANDSCAPE	100-foot Pool Envelope (This is very important for regulation)	The immediate area around the pool	VP_100

	750-foot Critical Terrestrial Habitat	Estimate land use outside pool envelope – estimate distance (species can use up to 750 feet)	VP_750
QUALITY	This is based on pool size and number of animals + the quality of the surrounding area	none low medium high	

References and Links:
* available from Vicki Smith at the Zoning and Planning office, and on the HCC Vernal Pool Information web site.

***HCC Vernal Pool Data Form** (1 page)
HCC Vernal Pool Data Form 2022.pdf

***NHFG Vernal Pool Manual** (88 pages)
Marchand, M. 2016. *Identifying and Documenting Vernal Pools in New Hampshire, 3rd ed*. NH Fish & Game Department, Concord, NH.

***USACE Vernal Pool Data Form** (2 pages)
USACE Vernal Pool data form 2016.pdf US Army Corps of Engineers-New England District

***Harris Center Volunteer Handbook** (20 pages, includes data form)
Thelen, B.A. et al., 2018. *Vernal Pool Project: Volunteer Handbook.pdf.* Harris Center for Conservation Education, Harrisville, NH

Harris Center Vernal Pool Project
https://harriscenter.org/programs-and-education/citizen-science/vernal-pool-project

Vermont Center for Ecostudies Vernal Pool Monitoring:
https://vtecostudies.org/projects/forests/vernal-pool-conservation/

Excellent Field Guide:
Kenney, L. P. and M. R. Burne, 2001 (reprint 2009). *A Field Guide to the Animals of Vernal Pools*. Massachusetts Division of Fisheries & Wildlife, Westborough, MA.