Partnerships to support vernal pool management, restoration and monitoring in Pennsylvania

North American Wetland Managers

9/25/2025

PNHP

Pennsylvania Natural Heritage Program

Pennsylvania Natural Heritage Program

About PNHP

Learn about our mission, how we work, and how to contact our staff.

Species and Natural Features

Find species and features subject to environmental review by PNHP jurisdictional partner agencies. View other species of interest, rare natural communities, or geologic features.

Ecological Communities

Find tools to identify terrestrial, palustrine and aquatic ecological communities found in Pennsylvania and learn about their importance.

Conservation Tools

Explore interactive maps and conservation tools including the County Natural Heritage Inventory, Conservation Opportunity Area tool, Plant Factsheets, iMap Invasives, Conservation Case Studies and more.

Research and Initiatives

Access PNHP scientific publications and explore projects our staff are working on to address climate change, protect vernal pools, and study plants and wildlife across Pennsylvania.

Conservation Explorer

Visit the Conservation Explorer for conservation planning purposes and Pennsylvania Natural Diversity Inventory (PNDI) environmental review.

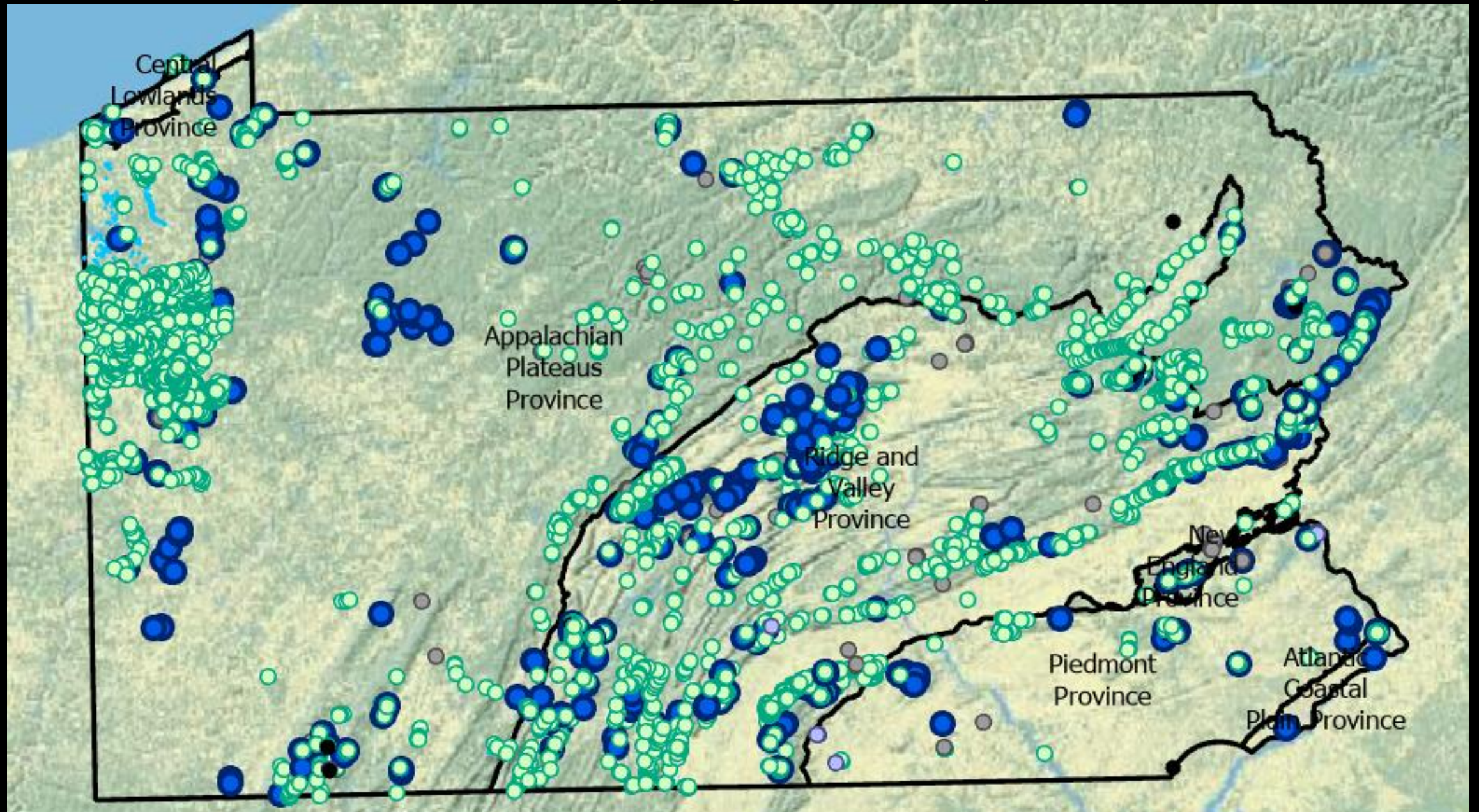
http://www.naturalheritage.state.pa.us/Default.aspx

NatureServe

- International network of natural heritage programs
- Gather information on the location and status of important ecological resources
- Scientific data to support effective conservation action.

https://www.natureserve.org/

Vernal Pool Mapping in Pennsylvania



Vernal pool data collection and ranking

Vernal Pool Registry

Prior to field work, you may want to download these additional materials:

- Getting Started
- Register a Vernal Pool - Instructions
- Register a Vernal Pool - Forms
- Vernal Pool Brochure

PA Natural Heritage Program website >
Ecological Communities >
Vernal Pool Communities >
Register a Pool

Vernal Pool Studies

Scientific study forms are available for download for more intense studies of vernal pools.

- Getting Started
- Study a Pool - Site Survey Form
- Study a Pool - Single Pool Survey Form
- Study a Pool - Conservation Ranking Form

https://www.naturalheritage.state.pa.us/VernalPool_Register.aspx

Attributes

Selection Layers

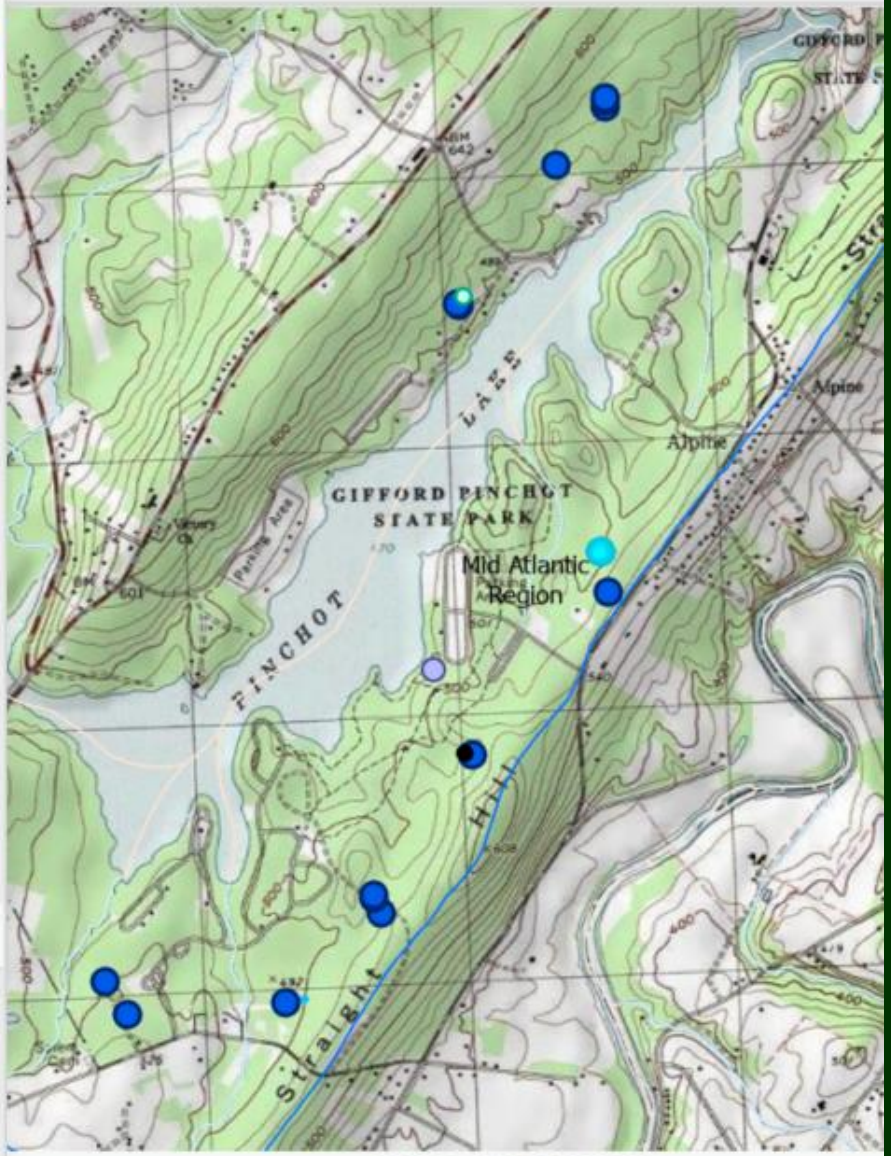
Change the selection.

- POND EDIT : Pool Info (1)
  - GPSP Alpine 2 Pond
    - Contacts
      - 742
    - Pool Extent - pool_extent
      - WPCLEP0724
    - Species
      - *Marbled Salamander (Ambystoma opacum)*
      - *Spotted Salamander (Ambystoma maculatum)*
      - *Spotted Salamander (Ambystoma maculatum)*
      - *Wood Frog (Lithobates sylvaticus)*
      - *Wood Frog (Lithobates sylvaticus)*
      - Copepods (Copepoda)
      - Green Frog (Lithobates clamitans)
      - Seed Shrimp (Ostracoda)
      - Snapping Turtle (Chelydra serpentina)
      - Water Boatmen (Corixidae)
      - Water Fleas / Daphnia (Cladocera)
      - Water Striders (Gerridae)
    - Surveys
      - 890
      - 894
      - 904

Attributes Geometry

OBJECTID	5494
Pool ID	WPCLEP0724
Pool Name	GPSP Alpine 2 Pond
Alternate Pool Names	Gifford Pinchot State Park
Is this a vernal pool?	Yes
Pool confirmation status?	Confirmed - visited
Pool Status Comments	Wetland of anthropogenic origin, basin was expanded during vernal pool r

Inquiry Labeling



76.8381116°W 40.0830546°N

Attributes Zoom To Switch Clear Delete Copy

IFIC NAME COMMON NAME ELEMENT ID SOURCE FEATURE DES SOU

PA VERNAL POOLS – CONSERVATION RANKING

Refer to the Vernal Pool Site and Pool Survey Forms for details.

SPECIES RANKING (*Species data is required to create a rank for animal assemblage purposes).*	**A**	**B**	**C**	**D**
Vernal Pool Indicators[1]	☐	☐	☐	☐
Egg Mass Abundance[2] : Mark whether an A or B ranked egg mass abundance was observed on site.	☐	☐	NA	NA
Indicator Species Rank: You can raise the vernal pool indicator rank by one grade if an 'A' egg mass abundance is present.	**Indicator Species Rank =**			
Species of Conservation Concern [3]: Check if a Species of Concern listed under #3 below was observed on site.	☐	NA	NA	NA
Final Species Rank: You can raise the overall species rank by one grade if a species of conservation concern is present.	**Final Species Rank =**			

HABITAT RANKING	**A**	**B**	**C**	**D**
Metapopulation Potential[4]	☐	☐	☐	☐
Habitat Integrity[5]	☐	☐	☐	☐
Habitat Diversity[6]	☐	☐	☐	☐
Protection from Threats[7]	☐	☐	☐	☐
Scoring System: A = 4 B = 3 C = 2 D = 1 **Habitat Rank:** A = 14-16; B = 10-13; C = 7-9; D = 4-6	**Habitat Score =** **Habitat Rank =**			

Combined Rank: Combine the Species and Habitat Rank, list the higher rank first. If they are the same rank simply list the common rank. **Comments:** Summarize main reasons for the final rank, and additional considerations used to adjust it.	***Combined Rank =*** *Comments:*

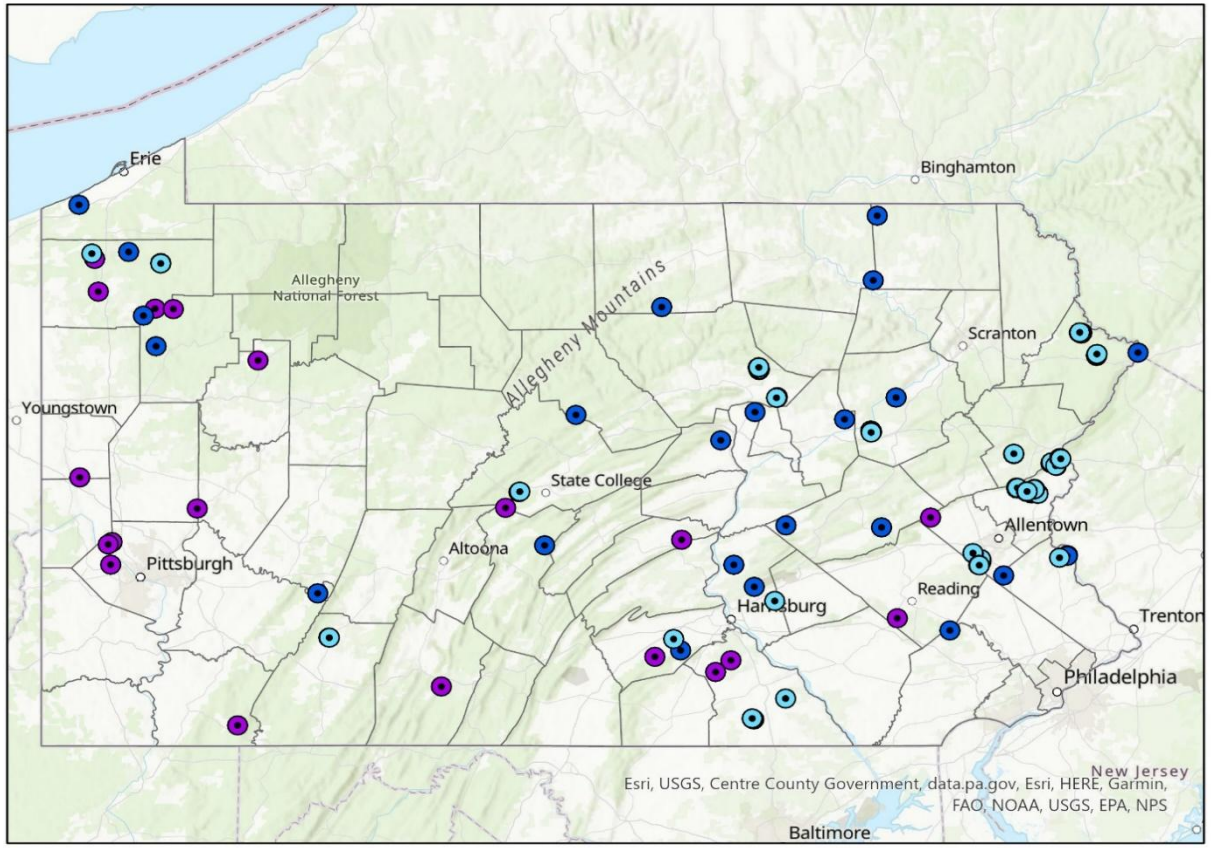
SPECIES RANKING GUIDELINES

1. **Vernal Pool Indicator Species**: Count the number of indicators observed for all the pools at a site. Indicators include mole salamanders (*Ambystoma* spp.), wood frogs (*Lithobates sylvaticus*), Eastern spadefoots (*Scaphiopus holbrookii*), and any species of fairy or clam shrimp.
   Rank: A = 3+; B = 2; C = 1; D = No indicator species.

2. **Egg Mass Abundance**: Use this factor to identify good to exceptional breeding activity in a single pool (may be an isolated pool or any one pool within a vernal pool cluster).
   A Rank = At least one pool supporting a high density of egg masses (combined species total over 100)
   B Rank = 20 or more spotted salamander egg masses and/or 40 or more wood frog egg masses

3. **Species of Conservation Concern associated with vernal pools**
   (Tracked species should also get their own Element Occurrence if present at a site)

Vernal Pool Landowner and Technical Assistance Sites



- Vernal Pool Technical Assistance 2011
- Vernal Pool Technical Assistance 2016
- Vernal Pool Technical Assistance 2022
- Counties

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Map created 2/1/2023

http://glacierpoolspreserve.com/home/

Find Information on Pennsylvania's Vernal Pools

- Educational Materials
- Identification of Vernal Pool Species
- Laws and Regulations
- Conservation and management best management practices
- Resources for land owners & managers

http://www.naturalheritage.state.pa.us/VernalPools.aspx

Vernal Pool Conservation and Management Guide

Download it from our **Vernal Pools of PA** website under the 'Resources Tab' at

https://www.naturalheritage.state.pa.us/vernalpools.aspx

VERNAL POOL CONSERVATION AND MANAGEMENT

A Guide to Vernal Pool Stewardship on Pennsylvania State Forest and State Park Lands

DRAFT

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pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
www.dcnr.state.pa.us

Information on:

- Vernal pool definition and importance
- Threats
- Inventory & monitoring
- Preventing the spread of wildlife diseases, invasive plants & animals
- Environmental review
- Law enforcement
- Special protection areas

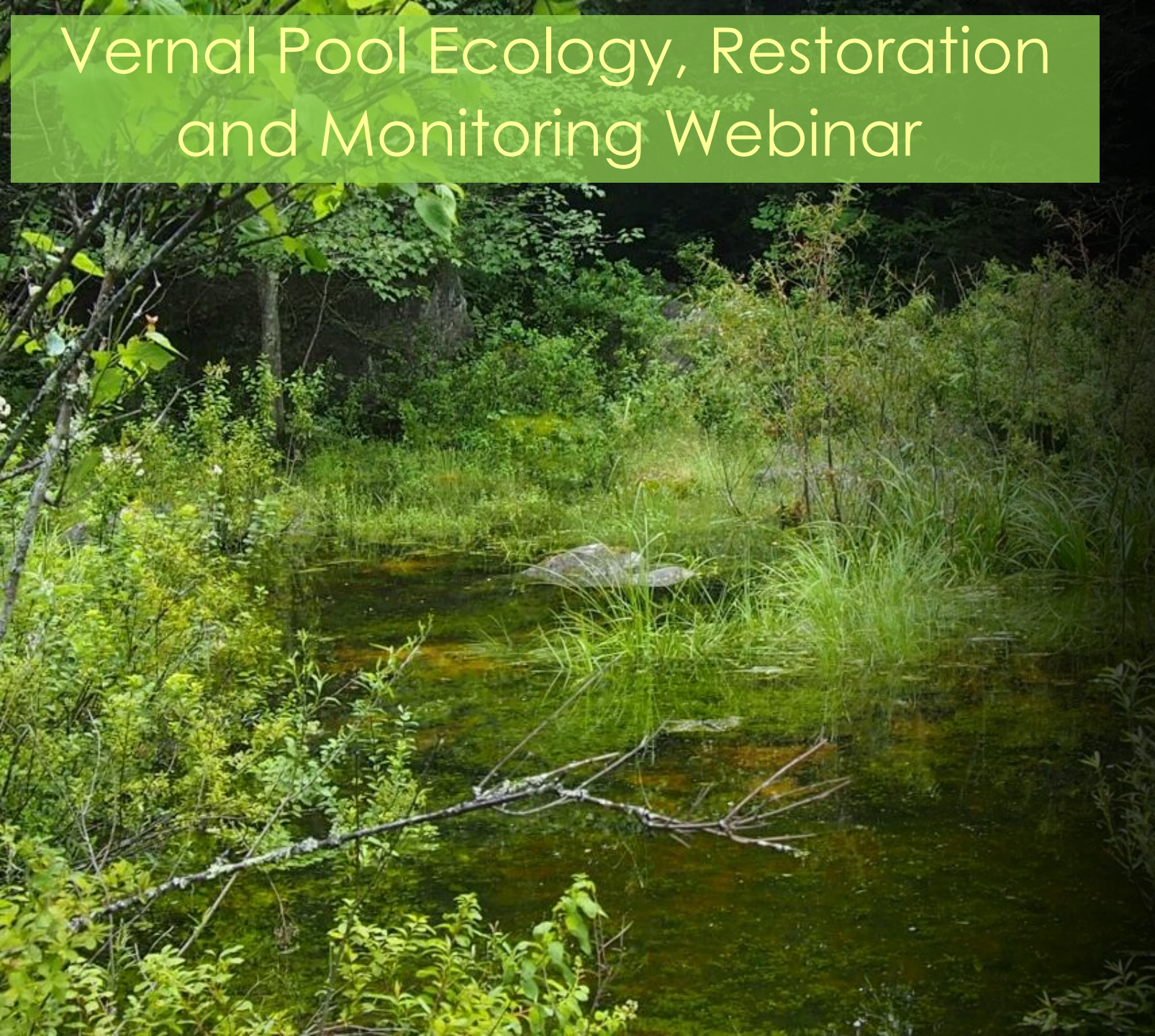
BMPs for:

- Timber sales
- Log landings and logging roads
- Fuelwood cutting
- Mowing & prescribed burns
- Herbicides & insecticide application
- Placement & maintenance of roads
- Wildlife passage
- Placement of recreational trails
- Oil & gas development
- Vernal pool creation and restoration

Before Wetland Restoration
(July 2020)

After Wetland Restoration
(October 2022)

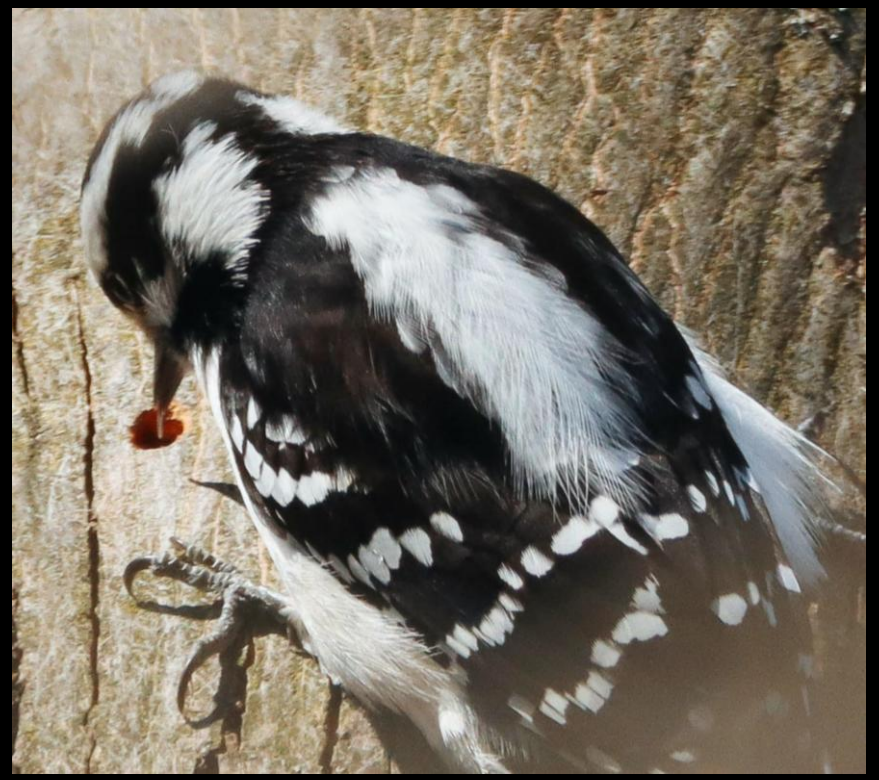
Vernal Pool Ecology, Restoration and Monitoring Webinar



Learn more about vernal pools and wetland restoration in this webinar series:

- Part 1: Vernal pool ecology & wildlife
- Part 2: Wetland loss & wetland restoration planning
- Part 3: Wetland restoration techniques & case studies
- Part 4: Post-restoration work & monitoring, Q&A, resources

Visit the PNHP YouTube Channel at: https://www.youtube.com/@pennsylvanianaturalheritag3305/videos



Vernal Pool Monitoring

Photos by Shawnna Lockwood

Long term monitoring

- Opportunities
  - Lots of ways to engage volunteers!
  - Look for ways to 'lighten the load' through more passive and citizen science monitoring techniques
- Challenges:
  - Support for long-term monitoring, addressing post-restoration issues

Monitoring Goals

- Wetland Hydrology (flooding, drying)
- Vernal pool amphibians
- Plant and amphibian phenology
- Seasonal / annual reference photos
- Periodic water chemistry testing
- Monitor and control invasive plants
- Monitor native plantings
- Continued habitat improvement
- Early detection of emerging problems
- Continued education and outreach

Vernal Pool Phenology Project

- A regional vernal pool monitoring effort led by the Ecological Research as Education Network
- Emphasis on monitoring pools for shifts in phenology of amphibians and vegetation due to climate change
- https://erenweb.org/active-projects/vppp/

Great Lakes Vernal Pool Collaborative

Goal: To design a Great Lakes vernal pool citizen science program and form a regional collaborative in order to map, monitor, and share information about vernal pools in the Great Lakes region

Overall Goal & Scope of NASA Grant

To design a Great Lakes vernal pool citizen science program and form the Great Lakes Vernal Pool Collaborative (GLVPC) in order to map, monitor, and share information about vernal pools in the Great Lakes region

Michigan Tech Research Institute

aka Regional Collaborative

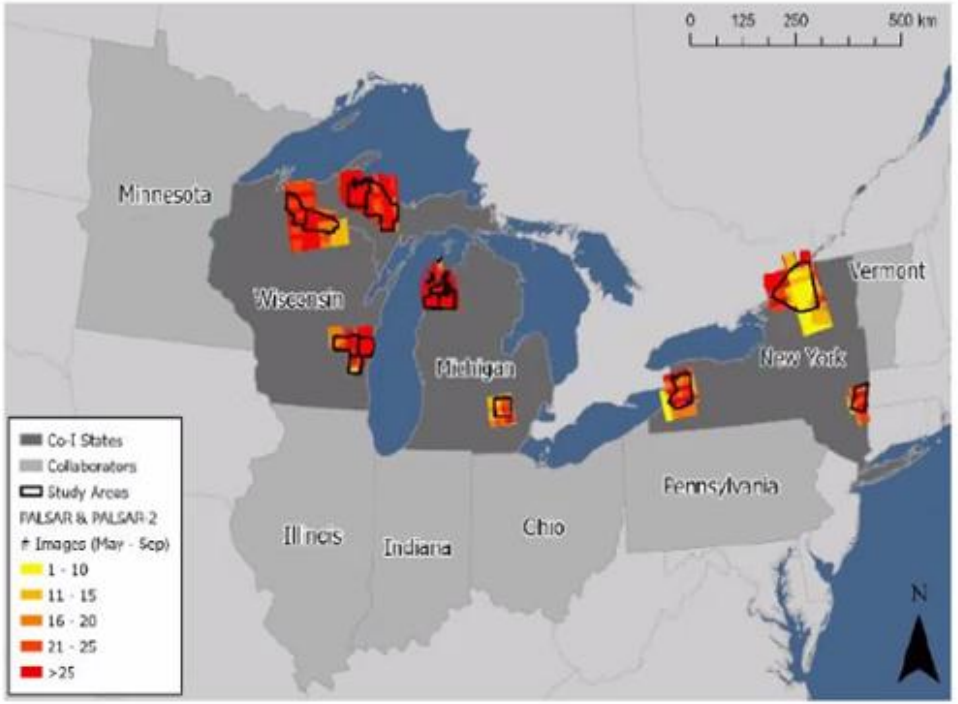
Mapping & Monitoring

GLVPC

Michigan

Wisconsin

New York



Michigan

Wisconsin

New York

Pennsylvania

Ohio

Illinois

Indiana

Minnesota

Vermont & Maine

Great Lakes Vernal Pool Collaborative

(1) Hold GLVPC workshops/meetings to develop a common vernal pool definition, data standards, field data collection/monitoring protocol, and data management, quality control and assurance plan

(2) Calibrate and validate the multi-sensor SAR-LiDAR approach to identify PVPs across diverse landscapes in Michigan, Wisconsin, and New York, and refine methods as necessary

(3) Identify and engage partners and stakeholders for implementing the program in Michigan, Wisconsin, and New York, and build an expanded community of Great Lakes program partners and stakeholders

(4) Develop an open-source web mapping interface for GLVPC data storage, documentation, and sharing/access

(5) Integrate and enhance existing individual state vernal pool databases for data management and sharing, and begin to build a Great Lakes regional vernal pool database with new data

Thank-
you!

More info: Betsy Leppo - bleppo@paconserve.org