Appendix H
Pennsylvania Waterways and Wetlands Update
March 2020

Acknowledgements: Special thanks to the Pennsylvania Department of Environmental Protection, the Pennsylvania Natural Heritage Program, and the Pennsylvania Game Commission and Fish and Boat Commission for their assistance with this report.

2020-2024 Pennsylvania Comprehensive Outdoor Recreation Plan

Pennsylvania Waterways and Wetlands Update

Introduction

In 2019, the PA Modeled Wetland Occurrence statewide mapping project was completed. The maps were developed to provide an alternative to the National Wetland Inventory (NWI) which only mapped 400,000 acres of wetlands in Pennsylvania.[1] The NWI maps drastically under mapped wetlands across Pennsylvania. The new mapping approach has advanced the science of landscape modeling and interpretation. The processes utilized were published in peer reviewed journals and are being looked at by other jurisdictions as well as the U.S. Fish and Wildlife Service for utility in assisting NWI future efforts. The mapping resulted in an estimated 1.2 million acres of additional wetlands identified over NWI estimates of approximately 400,000 as previously discussed. (note numbers were rounded to nearest 100K for ease).

The tables below provide some additional details on the mapping efforts. The first table provides a breakdown of the mapped wetland areas based upon vegetation class. This mapping data has not been field validated and is still believed to under represent wetland occurrence in many areas.

2019 PA Modeled Wetland Occurrence Mapping

Wetland Vegetation Class	Number of Mapped Units	Acreage
Emergent	239,281	223,764
Scrub\Shrub	212,742	119,357
Forested\Woodland	548,124	1,247,891
Total Wetlands	**1,000,147**	**1,591,012**

Source: http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=3137

Pennsylvania has experienced significant losses of wetland acreage over the last century, although it is believed that most of the Commonwealth's wetland losses likely occurred during the early colonization and are buried under legacy sediments. More recently studies have shown that, in the early 1980s, Pennsylvania began achieving a net annual gain of wetland acreage. The second table below includes lands that modeled as likely wetlands but due to object imagery interpretation do not appear to be wetlands at this time and therefore represent potentially restorable wetland areas.

[1]Tiner, Ralph W. 2010. Wetlands of the Northeast: Results of the National Wetlands Inventory. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA. 71 pp.

2019 PA Modeled Restorable Lands Mapping

Site Size Class	Number of Mapped Units	Acreage
< 1.0 acres	100,605	62,281.72
1.0 < 5.0 acres	91,697	196,588.50
5.0 < 10.0 acres	14,368	100,031.21
10.0 < 15.0 acres	4,707	57,027.54
15.0 acres and larger	5,868	187,312.58
Total	**217,245**	**603,241.55**

Source:
http://www.pasda.psu.edu/uci/DataSummary.aspx?dataset=3136

In March of 2011, Pennsylvania finalized its 2011-2020 Aquatic Resource Protection and Management Action Plan (PARMAP) which provides a framework and direction for the Pennsylvania Department of Environmental Protection (DEP) and its partners to strengthen and improve the wetland programs that provide regulatory oversight, management, restoration and monitoring of wetlands and other aquatic resources. The current 2011 PARMAP action plan is available, here: http://water.epa.gov/type/wetlands/upload/pa_aquatic_resource_program_plan.pdf/. Over the past 10 years, the Commonwealth has accomplished many 2011 PARMAP objectives. For accomplishments and ongoing efforts, refer to the ***Ongoing Waterway and Wetland Program Initiatives*** section. DEP is also in the process of updating the PARMAP.

Pennsylvania Wetland Types and Functions

Classification

The Pennsylvania Plant Community Classification ("Terrestrial and Palustrine Plant Communities of Pennsylvania," Zimmerman et al. 2012) identifies 78 unique wetland plant community types in the Commonwealth.[2]This classification has been adopted by the Pennsylvania Bureau of Forestry, The Pennsylvania Game Commission and the Pennsylvania Department of Environmental Protection as the basis for describing the vegetation communities that they assess and manage. The classification can be found online at http://www.naturalheritage.state.pa.us/Communities.aspx.

[2] Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition. Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

The 78 types of wetlands can be organized into five broad physiognomic classes:

A. Palustrine Forests

Palustrine forests are dominated by trees over 20 feet in height with a canopy of greater than 60 percent. Palustrine forests may vary in composition from nearly all conifers to entirely hardwood or a mix of both. These forests can vary in hydrology from temporarily flooded floodplain forests to permanently flooded swamps, to saturated hemlock swamps and black spruce-tamarack bog forests. Typical tree species in palustrine forests are eastern hemlock, red and black spruce, tamarack, silver and red maples, river birch, black gum, black willow, pin oak, swamp white oak, sycamore, American elm, and green and black ash. Palustrine forests are the most common class of wetlands in Pennsylvania. There are 18 different palustrine forest plant community types in the Commonwealth.

B. Palustrine Woodlands

While trees are present in palustrine woodlands, the canopies of woodland communities are more open than palustrine forests, usually with less than 60 percent canopy cover. This often results in a greater diversity of shrubs, grasses, sedges, and other herbaceous plants as there is more light available to the forest floor. In general, these wetlands are saturated or flooded more frequently than palustrine forests, which results in fewer trees in the canopy. Trees are often stunted because of hydrologic stress. Palustrine woodlands typically occur in a transition zone between forested wetlands and more open shrub and herbaceous wetlands. There are seven palustrine woodland plant community types identified in the Pennsylvania community classification.

C. Palustrine Shrublands

Palustrine shrublands are relatively common and occur in a wide variety of settings including floodplains, wet meadows, bogs, and vernal pools. They are characterized by having less than 25 percent tree canopy cover and greater than 25 percent shrub cover. Typical shrub species include alders, willows, dogwoods, highbush blueberry, winterberry holly, arrow-wood viburnum, poison sumac, meadowsweet, bayberry, and leatherleaf. There are 18 types of palustrine shrublands described in the Pennsylvania community classification.

D. Herbaceous Wetlands

The majority of Pennsylvania's herbaceous wetlands are considered to be persistent emergent marshes, where the substrate is saturated or flooded most of the year and vegetation emerges from the soil or water. These wetland types are characterized by a wide variety of sedges, grasses, rushes, broad-leaved herbaceous plants. Low growing woody species like cranberry may also be a part of herbaceous wetlands. Trees and tall shrubs may be present, but are a minor component of these communities, typically less than 25% cover. Herbaceous wetlands include some of the rarest plant communities in the Commonwealth, usually in association with unique physical settings such as glacial bogs, large cobble flats on river floodplains, and calcium-rich fens and seeps. Herbaceous wetlands also include plant communities representing disturbed or degraded habitats, often dominant by invasive herbaceous species, such as Japanese knotweed, common reed, and reed canary grass. Wet meadows maintained by periodic mowing and grazing are also considered herbaceous wetlands. Pennsylvania has 29 types of emergent marsh herbaceous wetlands.

Pennsylvania also has two non-persistent emergent wetland plant community types. These are characterized by shallow floating aquatic or emergent vegetation in permanently flooded areas. After

the growing season, the vegetation typically dies back to bulbs or tubers, leaving no trace of vegetation at the water surface (hence, non-persistent).

E. Sparsely Vegetated Wetland Communities

The Pennsylvania plant community classification includes four plant communities that are characterized by sparse vegetation cover. Three of these communities are associated with high energy environments, including the Lake Erie shoreline as well as scoured bedrock river shorelines. These wetlands are characterized by a sparse cover of native and introduced annual species that are able to tolerate the intense natural disturbances caused by high velocity floodwater and ice-scour. In contrast, the fourth type, the Sparsely Vegetated Vernal Pool Community, is characterized by a sparse cover of shrubs, grasses, sedges, rushes and broad-leaved forbs under a partial to closed forest canopy of trees adjacent to the seasonally flooded pools. Vernal pools are home to a unique flora and fauna, adapted to the ephemeral nature of the habitat.

Important Wetland Functions

Many plant and animal species are entirely dependent upon wetlands for survival. Wetland-adapted animals spawn, nest, breed, rest, and raise their young in these habitats. Plants find suitable conditions to germinate grow and flower there. Wet environments, together with large amounts of nutrients, often result in an abundance of vegetation. This mass of plant material traps the sun's energy and is a driving force in the wetland. Due to their great productivity, the biodiversity, or species richness, of most wetlands is typically very high. The large number of species dwelling in some types of wetlands makes them vast libraries of genetic material. Wetlands also function to improve water quality, add to a healthy environment and aid humans in a variety of ways. They help control flooding, filter water, and buffer the impacts of extreme weather events. Riparian buffers are critical to reducing sediment in stream and rivers. Wetlands serve as a carbon-sink; storing carbon in wetland soils is important to mitigating the effects of global climate change. Finally, wetlands are important recreational resources, providing opportunities for hunting, bird watching, and other outdoor recreational activities.

Pennsylvania's Wetland Regulations and Permitting

Chapter 105

The term "wetland" describes, in a collective way, what are more commonly known as marshes, bogs, swamps, and wet meadows and while there are several technical definitions of wetlands, for regulatory and legal purposes, the Commonwealth of Pennsylvania (25 Pa. Code Chapter 105) uses the following:

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions including swamps, marshes, bogs and similar areas."

Most activities in Pennsylvania water courses, water bodies or wetlands require some type of authorization or permit from the DEP to protect public health, safety and the environment. Activities that change, expand or diminish the course, current or cross section of a watercourse, floodway or water body are termed encroachments (obstructions in certain cases) and are regulated by Chapter 105 regulations. Many of these projects qualify for a simple general permit if they are designed and constructed in accordance with the criteria in the general permit. The applicant needs to complete and submit a registration form available from delegated County Conservation Districts or a DEP Regional Offices. The local municipality and county must be notified of the applicant's intent to use the general permit.

Most projects in Commonwealth waters and wetlands also require federal authorization that is usually granted in the form of a Pennsylvania State Programmatic General Permit (PASPGP-4). PASPGP-4 is a federal Clean Water Act, Section 404 Permit that authorizes the discharge of dredge and fill material into waters of the United States. PASPGP-4 allows single agency review and processing, eliminating the need for dual and often redundant state and federal reviews,processing and permit issuance procedures. In most instances, PASPGP-4 can be issued, with approved Chapter 105 water obstruction and encroachment permits, by the DEP or a County Conservation District.

25 Pa. Code Chapter 105.18a requires the applicant to replace all unavoidable wetland impacts in accordance with 25 Pa. Code Chapter 105.20a, which requires wetland replacement to meet three criteria: area ratio, function and value replacement, and siting criteria. In addition, decisions will be made based on Department guidelines entitled "Design Criteria for Wetlands Replacement."

Wetland Permitting Program in Pennsylvania

A. Single and Complete Projects

To provide effective environmental protection and regulatory compliance assistance, proposed activities that involve the multiple discharges of dredge or fill material, excavation or encroachments of waterways, water bodies and wetlands will be reviewed as a single and complete project. This single and complete project review process will give DEP the opportunity to assist applicants during project development to minimize and avoid impacts to water resources to the maximum extent practicable.

A single and complete project review provides enhanced environmental protection, timely permit actions and improved program efficiency. To facilitate single and complete project reviews, the project plan must provide all the proposed impacts to waters and wetlands associated, proposed or accomplished by one owner/developer or a partnership or association of owners/developers. Anyone who may be unfamiliar with DEP's permitting process, or is planning a large-scale project, should request a pre-application meeting with the DEP Regional Office. Pre-application meetings are particularly important for large or multi-phased projects that are designed and built over several years. These meetings are used to review and discuss the applicant's plans, assist the applicant in avoiding and minimizing impacts and determine what permits will be required.

The pre-application meeting will also help to determine other potential issues with the project such as endangered species or cultural resources identified on the property.

B. Waivers

There are 16 different structures or activities for which the requirements for a permit are waived. If DEP receives a complaint, or investigates, and finds a structure or activity which is eligible for a waiver has a significant effect upon safety or the protection of life, health, property or the environment, the owner may be required to apply for and obtain a permit.

C. General Permits

There are 12 different general permits, each corresponding to a particular activity. Prior to registration, an applicant must review the appropriate general permit and determine if the proposed project can be constructed in accordance with the conditions, restrictions and performance criteria identified for that specific permit. In recent years, according to the DEP

Bureau of Bureau of Waterways Engineering and Wetlands, Division of Wetlands, Encroachments and Training, the five most commonly used General Permits are GP-11 Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments, GP-5 Utility Line Stream Crossings, GP-7 Minor Road Crossings, GP-8 Temporary Road Crossings, and GP-3 Bank Rehabilitation, Bank Protection and Gravel Bar Removal.

D. Water Obstruction and Encroachment Permit

If a project does not qualify for a waiver or general permit, DEP's Chapter 105 Rules and Regulations allow for two types of application (Small Project and Standard) to be made for a Water Obstruction and Encroachment Permit. Either type of application can be made using the Joint Permit Application Form. The applicant shall indicate which type of application is being made at the beginning of the form and then follow subsequent instructions to complete the application type indicated.

1. Small Projects Application

    a. A Small Projects Application may be made for projects in streams and floodways where insignificant impacts on safety and protection of life, health, property and the environment can be demonstrated without detailed studies or engineering calculations.
    b. The Joint Permit Application Package should be consulted for specific criteria limiting small project applicability.

2. Standard Application
    a. A Standard Application must be completed for all projects except those qualifying as small projects and all projects affecting wetlands.

E. Permit Fees

On February 16, 2013, DEP implemented fees for Chapter 105 permit authorizations. To assistant applicants in determining their water obstructions and encroachment authorization fee, a fee calculation worksheet was developed. This fee calculation worksheet is available, here: http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-11444.

F. Monitoring and Compliance

The most frequent violation is working without a permit. Pennsylvania's wetland program does not have a specific inspections program; inspections are usually done after a complaint has been issued. Permitted dams are regularly inspected and when a wetland is impacted, the compensatory replacement site must be monitored by the permit holder for a five-year period of time. The reports are required biannually for the first two years, and annual for the third, fourth, and fifth years.

Ongoing Waterway and Wetland Program Initiatives

2020 Update to Pennsylvania Aquatic Resource Protection and Management Action Plan

The Commonwealth has accomplished a significant amount of the objectives of the 2011 PARMAP. The program development efforts are now at a critical juncture and updating the 2011 PARMAP in 2020 is pivotal to providing the necessary planning to advance program development efforts and rapidly turnkey them into actionable outcomes over the next five years. Significant progress has been made to improve the program's understanding of aquatic resources and as a result, critical questions and gaps have been raised that affect the structure of the 2011 PARMAP. The use of a broader set of partners representing important and diverse areas of expertise, as well as perspective, to further develop and refine these issues is needed moving forward. This effort will yield a PARMAP that provides well defined objectives with specific actions and direction for specific activities providing a clear plan to follow. For example, considerable resources have been invested in past program development efforts to identify terrestrial, palustrine and riparian/floodplain plant communities; develop community classification tools, descriptions/factsheets and best management practices; and investigate the utility of the related data for a variety of uses.

Environmental Protection Agency (EPA) Wetland Program Development

To implement PARMAP initiatives, DEP competes for grant monies from the EPA to help fund Wetland Program Development projects. These funds provide the primary source of funding for program development projects to help address new threats, ensure compensatory mitigation provides for lost functions, and to improve scientific understanding of the aquatic resources that helps develop better tools for restoration, protection, monitoring and assessment activities. The outputs from these projects impact other programs beyond the wetland program including Erosion and Sediment Control program (riparian buffers); NPDES MS4 program, TMDL programs (Chesapeake Bay TMDL nutrient reduction efforts); Public Water Supply, Sewage Facilities and the Post Construction Stormwater programs (wetland antidegradation).

Pennsylvania Natural Heritage Program's Wetland Community Research

The Pennsylvania Natural Heritage Program (PNHP) is currently working on several EPA-funded projects to increase the understanding of wetland composition, condition, and function in Pennsylvania. The goal of these projects is to provide information to guide management activities of state agencies and private landowners that results in better conservation of the Commonwealth's wetland ecosystems. The three projects include a project to assess and monitor headwater peatland wetlands, identify and characterize headwater streams, and document the location of seep and floodplain communities in the Potomac, Delaware, Genesee, and Lake Erie watersheds. Gaps exist in the understanding of composition and function of these wetlands and this hinders the ability of the agencies tasked with their management to effectively protect, detect changes, and respond accordingly.

In all three projects, PNHP's objectives are to evaluate the distribution and abundance of these specific wetlands in Pennsylvania, and to characterize the composition and local and regional environmental conditions of plant communities associated with these peatlands and assign quality rankings using NatureServe's Ecological Integrity Assessment criteria. In addition, for the peatlands assessment project, PNHP will collect specific data in long term monitoring plots to assess the effects of climate change within individual peatland wetlands. Outreach to state regulators, agencies, land trusts and conservancies, and private landowners will be built into all components of the projects.

Aquatic Resource Compensatory Mitigation

DEP is actively working in coordination with other state and federal agencies to advance compensatory mitigation efforts through development of a compensatory banking industry in Pennsylvania. The program efforts to date have been extremely successful and there are currently two private companies approved to provide third party compensation via mitigation banking across the Commonwealth. To date six projects have been approved or constructed that restored 121,842 linear feet of streams and 74.841 acres of wetlands. See the table below for additional mitigation banking project status as of January 2020

Private Entrepreneurial Mitigation Banking Status

Mitigation Banking Company	Bank Operating Permit Approval	Bank Site Permit	County	Construction Permit Status	Stream Credit (linear feet)	Wetland Credits (acres)
Land Reclamation Group (LRG)	100%	Tunnel Road	Somerset	Approved	2,719	5.49
		Furnace Run	Westmoreland	Review in Progress	2,354	3.46
		Shrader Hollow	Westmoreland	Review in Progress	12,704	17.94
Resource Environmental Solution (RES)	100%	USRMB 1	Potter	Constructed	1,935	1.95
		USRMB2 Phase 1	Potter/Tioga	Constructed	7,858	8.12
		USRMB2 Phase 2	Potter/Tioga	Approved	*	*
		Robinson Fork Phase 1	Washington	Constructed	95,227	48.88
		Enlow Fork Creek	Washington	Constructed	4,150	2.62
		Conneauttee Creek	Crawford	Review in Progress	11,234	26.84
		Codorus Creek	York	Constructed	9,953	7.78
		Robinson Fork Phase 2	Washington	Review in Progress	21,601	9.99
		Quaker	Berks	Review in Progress	17,121	17.75
		Laurel Hill	Somerset	Review in Progress	22,741	25.19

Technical Guidance Documents for Compensatory Mitigation

In 2020, DEP is finalizing technical guidance that provides a basis for establishing the amount of compensatory mitigation required for wetland and stream impacts. This effort ensures that science-based planning and data are used to guide mitigation decisions across the Commonwealth. At the same time DEP is actively working to update its In-Lieu-Fee (ILF) program to comply with the federal rules. The ILF program will provide partnering opportunities for the regulatory and resource agencies to work together to meet resource restoration needs on both private and public lands. The ILF program is expected to provide a significant amount of the compensatory mitigation needs for 5 to 10 years until private banking can significantly expand its role.

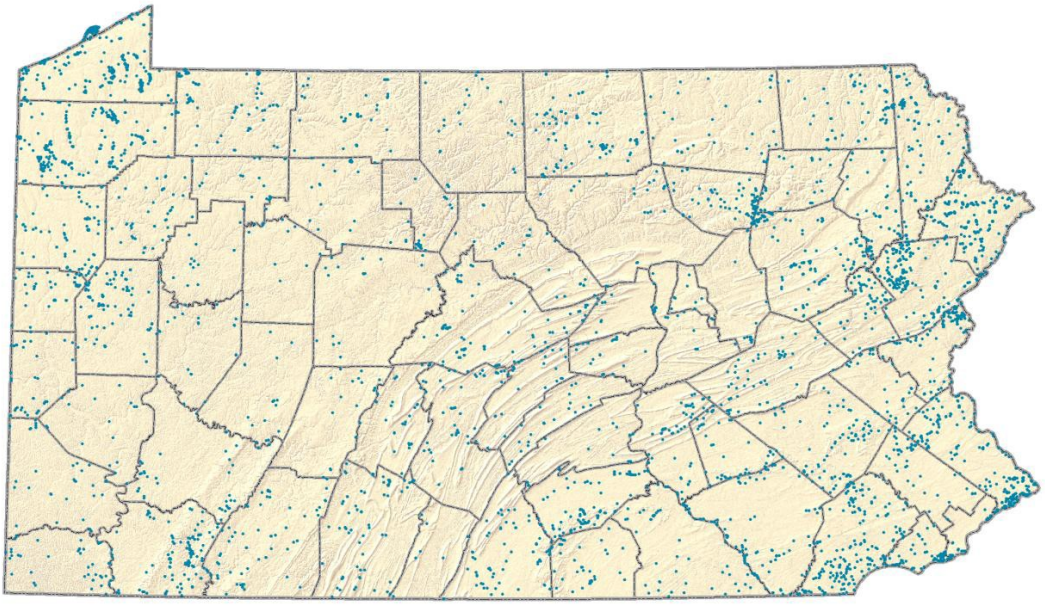
DEP Outreach

DEP continues to participate in seminars and workshops on wetlands and other environmental issues, as well as semi-annual training sessions for the public and private sector. Topics may include wetland functions and values, identification and delineation, permitting, and statewide policies.

Additional Wetland Conservation Activity

The Pennsylvania Natural Heritage Program

The Pennsylvania Natural Heritage Program (PNHP) is a partnership between The Department of Conservation and Natural Resources, the Western Pennsylvania Conservancy, the Pennsylvania Game Commission, and the Pennsylvania Fish and Boat Commission. PNHP's primary mission is to collect information on rare, threatened, and endangered plant and animal species, many of which inhabit wetlands. Additionally, PNHP has conducted studies to inventory and describe representative wetland communities including river floodplains, fens, bogs, and seeps across the Commonwealth. PNHP uses this information to describe and define the structure, composition, and ecological attributes of wetland communities in Pennsylvania (http://www.naturalheritage.state.pa.us/Wetlands.aspx). This information is intended to be used for management, restoration, and regulation of wetlands and to prioritize rare and high quality sites for conservation. Most recently, PNHP has been conducting field work to obtain baseline data on the composition and structure of specific wetland community types to assess ecological changes due to development, fragmentation, plant pests and disease, and climate change. PNHP ecologists have established several long term monitoring plots in peatlands and vernal pools throughout the state, primarily focusing on high quality examples. These data will help PNHP staff and other stakeholders better understand how specific plant communities are changing due to human-caused impacts.



This map depicts populations, represented by blue dots, of species or natural communities that occur in wetlands, as tracked by PNHP. Occurrences of wetland species represent about 38% of the occurrences of species that PNHP tracks.

Vernal Pools

PNHP has been working to locate, inventory and classify vernal pools for decades and although they represent but a small portion of Pennsylvania's wetlands, their importance for amphibian reproduction, invertebrate refugia and rare plants is high. Included in the program's vernal pool research are wet meadow habitats. Small wetlands such as vernal pools and wet meadows are easily overlooked and simple to drain or fill. Vernal pools and wet meadows can support specialist wildlife, and wet meadows are an important habitat for native pollinator insects. Small wetlands are particularly vulnerable to impacts from invasive species, forest pests, climate change, timber management, development, and other changes on the landscape.

Vernal Pool Definition

Vernal pools are true wetlands, as defined by soils, hydrology, and (usually) vegetation. They typically have fluctuating water levels with a period of dryness in late summer that prevents permanent establishment of fish populations. There is no permanent inlet or outlet, though they often seasonally overflow. While they are typically small and shallow, they can come in a great variety of shapes and sizes. Vernal pools are important because they provide valuable ecological services as all wetlands do. They slow flooding and erosion by trapping runoff; they remove pollutants and sediments by slowly filtering water through plants and soils; they improve the quality and quantity of our drinking water; and they improve the health of our streams. Vernal pools are also important because they support a distinctive community of plants and animals. Vernal pool indicator species are specialists that reproduce most successfully in fishless waters. In Pennsylvania, there are six amphibians (wood frog, spotted salamander, Jefferson salamander, marbled salamander, eastern spadefoot, blue-spotted salamander) and two types of crustaceans (fairy shrimp and clam shrimp) that use vernal pools almost exclusively for breeding and larval development.

Conservation Activitie

The PNHP works with partners across the state to conduct inventory and assessment, management, education, and long-term conservation activities around vernal pools. These partnerships are diverse and include private landowners, conservation organizations, universities, and local, state, and federal agencies. Activities include: ecological research into the relationships between vernal pool invertebrate, herptile, and plant communities, and the physiochemical environments of vernal pools (1, 2, 3); surveys to document vernal pools and their associated wildlife, development of voluntary recommendations for these sensitive habitats, and other types of technical assistance to landowners and partners to help them protect wetlands in their communities (4, 5, 6, 7); trainings on vernal pool identification and conservation and regional hands-on wetland restoration workshops (4, 5, 6); development of a public vernal pool registry and geodatabase to house information and locations of vernal pools which we can share for conservation planning and research projects (8, 9); development and enhancement of the PNHP's Vernal Pools webpages which provide comprehensive resources for vernal pool education and outreach (5, 6, 7, 8). The resources section provides a variety of educational materials on vernal pool ecology and natural history, including a vernal pool poster and identification guide, a synthesis of best management practices, forms for gathering baseline vernal pool data, and posters illustrating wetland restoration techniques. These resources can be accessed online at http://www.naturalheritage.state.pa.us/VernalPools.aspx.

1. Ecological Assessment of Vernal Pools and Upland Habitats in Ten Priority State Parks, in partnership with Clarion University. Wild Resource Conservation Program grant. Partnership between Clarion University and Western Pennsylvania Conservancy, 2016-2018.

2. The Pennsylvania Statewide Seasonal Pool Ecosystem Classification. Environmental Protection Agency Wetland Protection Development Grant and Wild Resource Conservation Program Grant awarded to Western Pennsylvania Conservancy, 2007-2009.
3. Refining the natural communities in Pennsylvania through zoological studies on State Lands: a study of vernal pool invertebrates in the Central Appalachian Ecoregion. Wild Resource Conservation Program Grant awarded to The Nature Conservancy, 2002-2004.
4. Management plans, landowner outreach, and restoration workshops to conserve vernal pools and wet meadows. Community Conservation Partnerships Program, Environmental Stewardship Fund, administered by Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. Western Pennsylvania Conservancy, 2018-2022.
5. Building Partnerships for Vernal Pool Conservation. Community Conservation Partnerships Program, Environmental Stewardship Fund, administered by Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. A collaboration between the Western Pennsylvania Conservancy, The Nature Conservancy, and the ClearWater Conservancy, 2014-2018.
6. Outreach and Technical Assistance for Seasonal Pools. Community Conservation Partnerships Program, Environmental Stewardship Fund, administered by Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. A collaboration between the Western Pennsylvania Conservancy, The Nature Conservancy, and the ClearWater Conservancy, 2009-2012.
7. Site-Based Conservation Planning on Private Lands for Critical Habitats in Pennsylvania. U.S. Fish and Wildlife Service Landowner Incentive Program grant administered by the PA Fish and Boat Commission. A collaboration between the Western Pennsylvania Conservancy, The Nature Conservancy, and the ClearWater Conservancy, 2009-2010.
8. Web-based Registry and Study of Seasonal Pools in Pennsylvania. State Wildlife Grant, PA Game Commission, Western Pennsylvania Conservancy and The Nature Conservancy, 2005-2007.
9. Vernal Pool Data Development. Department of Conservation and Natural Resources. Ongoing support for the Pennsylvania Natural Heritage Program to develop a new geodatabase named 'POND', the Pool Observation Networked Database. New spatial and tabular datasets are being incorporated to expand this statewide vernal pool dataset. Western Pennsylvania Conservancy, 2017-2019.

Pennsylvania Wildlife Action Plan

A State Wildlife Action Plan (Plan) is a non-regulatory, proactive conservation blueprint to prevent Species of Greatest Conservation Need (SGCN) from requiring federal protection under the Endangered Species Act. Priority species, location and condition of their habitats, current and potential threats to species and their habitats, and conservation actions are included as part of this voluntary, partnership-driven conservation framework. The Pennsylvania Wildlife Action Plan includes all habitat types; terrestrial, aquatic and subterranean. Wetlands and other aquatic systems are particularly valuable for recreational activities (e.g., birding, fishing, kayaking), yet outdoor enthusiasts should be mindful that these habitats host sensitive species that are highly vulnerable to human disturbance; Leave No Trace™ principles should always be followed.

The Plan enables states and territories to receive congressionally appropriated State & Tribal Wildlife Grants Program funds for at-risk species assessment, conservation planning and implementation. Since 2001, Pennsylvania has received over $33 million, matched by non-federal dollars, to implement important conservation actions for SGCN and their habitats. First published in 2005, and updated in 2015 as a decennial congressional requirement, the 2015-2025 Pennsylvania Wildlife Action Plan is a foundational document for guiding research and management of non-game fish and wildlife species in the Commonwealth (PGC-PFBC 2015).

The Pennsylvania Wildlife Action Plan is administered by the Pennsylvania Game Commission (PGC) and Pennsylvania Fish & Boat Commission (PFBC) reflecting their fiduciary responsibilities for fish and wildlife in the Commonwealth (PGC: birds, mammals; PFBC: fishes, reptiles, amphibians, and aquatic invertebrates). Terrestrial invertebrates are also included as SGCN though no Commonwealth agency has regulatory authority for these species.

To foster Wildlife Action Plan implementation, the PGC and PFBC, with assistance from numerous partners, developed a web-accessible Conservation Opportunity Area Tool (PGC-PFBC 2019). Launched in August 2019, this free tool offers information on SGCN, habitats, conservation actions to support species and habitats, research & survey needs, and much more. Registered users can view statewide range maps for SGCN or generate a report within a specific area (up to 5,500 acres) to learn more about SGCN in places of interest.

Literature Cited

PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission). 2015. Pennsylvania Wildlife Action Plan, 2015-2025. C. Haffner and D. Day, editors. Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission, Harrisburg, Pennsylvania.
PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission). 2019. Pennsylvania Wildlife Action Plan Conservation Opportunity Area Tool. Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission, Harrisburg, Pennsylvania. https://wildlifeactionmap.pa.gov.