



Summer 2019 Newsletter  
Volume 5, Issue 3

# Conservation Matters

## Late Summer...

This newsletter is more of a late summer newsletter, but I hope it finds you enjoying the warmer months as they start to wind down.

Summers are fairly busy in our office. Our staff have multiple projects to tend to, and our mosquito staff try to keep the pesky insects to a minimum. We are also preparing for the fall months when things start to quiet down a little, and planning for next year starts all over again.

As time continues to fly by, I hope you have the opportunity to enjoy the rest of your summer days. The days are already getting shorter, and fall is just around the corner.

Until fall,

*Judy Becker*

## Agricultural Planning Reimbursement Program Extended

The Department of Environmental Protection's (DEP) Agricultural Plan Reimbursement Program will provide \$1.3 million in reimbursement grants to help farmers with the cost of preparing agricultural plans.

State regulations require all farmers to implement manure management, nutrient management, or agricultural erosion and sediment control plans and, in some cases, more than one plan. Reimbursement funds are available to farmers for plans developed on or since January 1, 2019, and a farmer may be reimbursed for more than one plan. The deadline to register is April 1, 2020.



Farmers in Northumberland County interested in this program should contact Josh Glace at Larson Design Group, Inc. You may reach him at [jglace@larsondesigngroup.com](mailto:jglace@larsondesigngroup.com) or 570-374-5700 x4011.



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*"Conservation Matters" is  
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Conservation District.*

**Our Programs:** Erosion and Sedimentation Control, National Pollution Discharge Elimination System (NPDES), Dam Safety and Waterway Management, Environmental Education, Chesapeake Bay Program, Dirt & Gravel Roads, Agricultural Land Preservation, Watershed Protection and Education, Mosquito-borne Disease Control

Visit [www.nccdpa.org](http://www.nccdpa.org) for more information. We are also on Facebook at [www.facebook.com/nccdpa](https://www.facebook.com/nccdpa).

## NEW FACES AT NCCD AND NRCS

### Summer Interns

This summer, the NCCD was fortunate enough to have 2 summer interns with us for a period of time. Meet these future conservationists:



#### Desha Reinfeld

Hello! My name is Desha Reinfeld, and I was the summer intern from Bloomsburg University with the Northumberland County Conservation District. I started my journey here in mid-May, and I had a fun and informational experience! My major is Environmental Geographical and Geological Science with a focus in Geography and Planning. I grew up and graduated from Selinsgrove in 2015. Some activities that I enjoy when I'm not on a sports team is fishing, hiking, swimming, and traveling to new places! This internship had me participate in many different activities that I had never tried before such as planting trees, doing riparian buffers, surveying farms and crops, and even electro-fishing! I was very fortunate to be here and learned so much under highly educated and great individuals like the ones at the district!

#### Jordan Winhofer

For a portion of the summer of 2019, I had the honor of being an intern with the Northumberland County Conservation District. Upon conclusion of my internship, I obtained a degree in Geography with an environmental studies concentration and a minor in Biology from Millersville University. I grew up in Kulpmont, Pennsylvania and graduated from Mount Carmel High School in 2015. During my internship, I had the opportunity to work with the Mosquito Borne Disease technicians collecting traps and dragging for ticks, toured the Kevin Raker Barnyard Project with the Agricultural Technician, and went electro fishing in streams that have undergone stream restoration. I enjoyed the many opportunities I had during my time at the district.



The NCCD provides a summer internship to college students majoring in a conservation-related field. Our internship program has proven to be beneficial to both the intern and the District. Although a summer internship is not a guarantee of employment with the District, we currently have 2 full-time staff who were former summer interns with the NCCD!

### NRCS Welcomes New Staff

Please join us in welcoming David McCoy as the full-time Soil Conservationist for NRCS in Northumberland County. David previously worked in Mifflin County NRCS for the past 3 years. David graduated from Penn State with a degree in Forestry. With a strong background in conservation, we are excited for this addition to the NRCS team!

You may contact us at any time by email or phone to be added to, or removed from, our mailing list. Simply call 570-495-4665 or email [jbecker@nccdpa.org](mailto:jbecker@nccdpa.org). If you would rather "Go Green," email us with the words "electronic newsletter" in the subject line and we will send our newsletter to you electronically.

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*The Northumberland County Conservation District Board of Directors and Staff would like to thank our 2019 members for their kind donations. We would not be able to accomplish the work we do without our members' support! For more information on becoming a member of the NCCD, visit our website at [www.nccdpa.org](http://www.nccdpa.org) or call 570-495-4665. A membership form is also available below.*

## NCCD Membership Drive Form

### Northumberland County Conservation District

#### Your Information (please print or type)

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#### Membership Type (please circle one)

<b>Affiliate</b>	<i>Name in 1 NCCD newsletter.</i>	\$50.00	<b>Friend of Conservation</b>	<i>Business Ad in 2 NCCD newsletters.</i>	\$500.00
<b>Contributing</b>	<i>Name in 2 NCCD newsletters.</i>	\$75.00	<b>Conservation Partner</b>	<i>Business Ad in 3 NCCD newsletters.</i>	\$750.00
<b>Associate</b>	<i>Name in all 4 NCCD newsletters.</i>	\$100.00	<b>Conservation Benefactor</b>	<i>Business Ad in all 4 NCCD newsletters.</i>	\$1,000.00

**\*All memberships will appear on our website. NCCD will contact your business with ad due dates for newsletters.**



## WARRIOR RUN WATERSHED REHABILITATION INITIATIVE

by: Chantel Shambach, Watershed Specialist and Ryan Cherwinski, Agricultural Conservation Technician

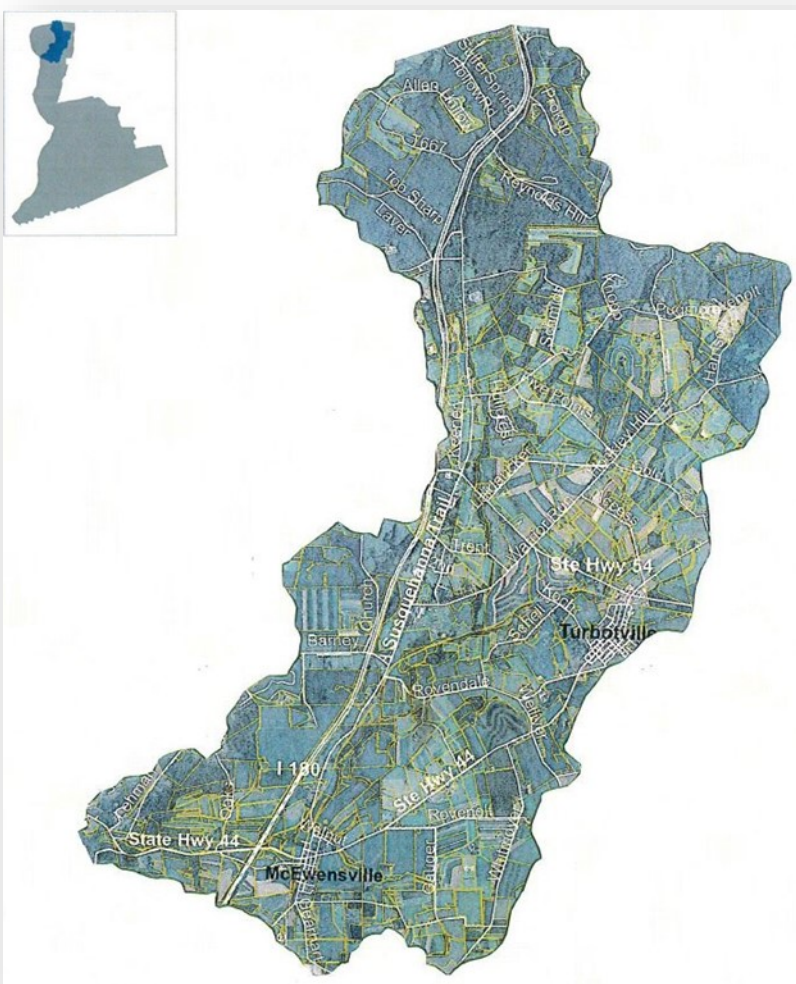
As mentioned in the past, Northumberland County Conservation District has a unique opportunity to improve water quality in the Warrior Run Watershed. The partnership with Natural Resources Conservation Service (NRCS) and the Department of Environmental Protection (DEP) has provided such an opportunity through the National Water Quality Initiative (NWQI). The progress through the NWQI is well on its way to success. The NWQI funding will provide many great opportunities for water quality enhancement practices, water monitoring, best management practice implementations, and agricultural assistance within the Warrior Run Watershed. However, NWQI will not have funding for community engagement, urban conservation improvements, and/or educational events. These types of actions will be very important for the maximum result of the watershed's rehabilitation, and that is why the District is seeking other means necessary to gain ample funding to cover those additional incentives. We hope to hear the results of those efforts by the end of 2019. However, we understand this turnaround will take many years and will continue to try and secure funding for the duration of the Initiative. If we receive grant support to restore water quality in the Warrior Run watershed, we will aim to break ground on the first wave of projects in Spring 2020. Here is a breakdown of the watershed we will be working in over the next several years:

Warrior Run flows through McEwensville Borough, Delaware, Lewis, and Turbot Townships, and portions of Watsontown Borough before emptying into the West Branch Susquehanna River; just south of Watsontown. The entire basin includes 48.78 stream miles and drains 21.6 mi<sup>2</sup>. The land use consists of forest, a mixture of agriculture, and urban in the rest of the basin. Interstate 180 runs north to south within the watershed, while State Highway 54 runs through the center of the watershed east to west. Numerous township roads provide access to the Warrior Run Watershed and its tributaries. The watershed's current designated use listed in Pa. Code 93.9I is Warm Water Fishery, Migratory Fishery. Agriculture is the dominant land use at approximately 55 percent. Forest land uses account for approximately 35 percent of the watershed. Developed areas consist of 10 percent of the watershed. Riparian buffer zones are nearly nonexistent in some of the agricultural lands. Livestock also have unlimited access to streambanks in certain parts of the watershed, resulting in streambank trampling and severe erosion.

NCCD's intention is to promote a "whole farm" approach. Installation and implementation of riparian buffers, streambank stabilization, urban stormwater infrastructure, aquatic habitat structure implementation, and educational outreach will help us meet our goal of increasing water quality and decreasing pollution loading into the tributary streams and rivers of the Warrior Run Watershed.

The first step in planning major restoration within a watershed is to get the word out to as many people as we possibly can. Nothing would be worse than someone needing assistance but not knowing about the opportunity. While the word is spreading, the conservation staff members are diligently making lists of people who are reaching out with interest. Interest in what exactly?

This priority watershed needs significant, restorative help. We are trying to offer as many conservation practices as we can.



## WARRIOR RUN WATERSHED REHABILITATION INITIATIVE, cont.

Some things that we are looking at regarding water quality enhancement practices are riparian buffers (trees located along the stream), stream bank stabilization, aquatic habitat structures, floodplain and wetland reconnection, stabilized cattle crossings, and streambank fencing. With water quality practices also comes assistance on agricultural land in the area. Some best management practices (BMPs) that we could assist in are cover crops, cropland best management practices, plan writing, manure storage facilities, barnyard developments, and grazing support. Although 55 percent of Warrior Run is agricultural land and the major land use, we want to make sure the urban areas are being assisted as well. Urban runoff can be managed through green stormwater infrastructure, retention basins, impervious services, and rain gardens.

The riparian buffers that we would like to install are referred to as multi-functional riparian buffers. The multifunctional buffers are great ways to establish bank stability, provide wildlife/pollinator habitat, enhance the local ecosystem, and offer harvestable goods for the landowner. The multifunctional aspect will supply various floral, berries, and nuts for harvest. Some examples of species selection that could be seen in a multifunctional buffer are: Witch Hazel, Pussy Willow, Red Maple, River Birch, Milkweed, Service Berry, Elderberry PawPaw, Black Walnut, and many more.

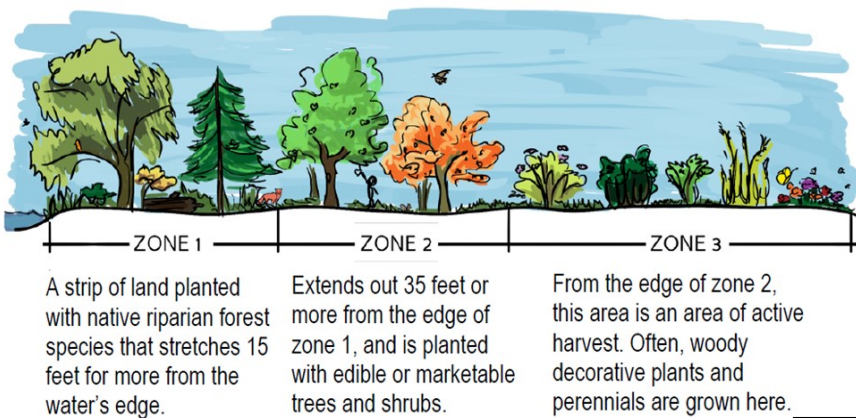




Figure 1: Riparian buffer zone layout. NOTE: Conservation district practices require a 35 foot buffer minimum.

Stream bank erosion causes many water quality issues due to excess sediment entering the waterway. Sedimentation is the process of loose soil traveling and settling within the water channel. Too much sediment entering the waterway creates low oxygen levels and stunts the fish's ability to take in oxygen rich water through their gills in order to breath. This type of pollution also can cause nutrient balance disturbance, loss of recreation attributes, and can even change fish migratory patterns. Some common practices that help reduce erosion, besides using riparian buffers, are implementing stream structures (see figures 2 and 3 on the next page). Some of these structures are dual purposed to help protect the stream banks and to help provide aquatic habitat.

Besides all of the water quality, agriculture, and urban assistance that can be implemented on land; the conservation district is very passionate about educational outreach among the community and schools. If you know of an organization and/or classroom that would be interested in a discussion on water quality, macroinvertebrate importance/identification, soil health, agriculture understanding, groundwater quality, storm runoff, recycling, etc., please contact the district with interest. Some common participants in the past have been libraries, girl/boy scouts, classrooms, summer camps, and farming communities.

## FULL-SERVICE CONSTRUCTION FOR HEAVY HIGHWAY





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## WARRIOR RUN WATERSHED REHABILITATION INITIATIVE, cont.



*Figure 2: Stream bank erosion stabilization time lapse using multi-log structures. These structures are dual purpose in providing aquatic habitat and water deflectors to reduce stress on the banks.*



*Figure 3: Stream bank erosion structure with rip rap offers bank stability.*

Do you, or someone you know, need assistance in the Warrior Run Watershed? If you do, please reach out to us. We would love to start off the first year(s) with as many people on the list as possible. If you have questions, or need further assistance, please do not hesitate to contact either Chantel Shambach or Ryan Cherwinski for help at (570) 495-4665!

## SUNBURY RIVER FRONT WPA WALL UPGRADES

*by: Michael McCleary, Erosion and Sedimentation Technician*

The city of Sunbury is conducting a large project with less visibility than the Central Susquehanna Valley Thru-Way. The banks which support the flood wall along Front Street are receiving a face lift. The old stone which protects the embankments is being refurbished with a new concrete structure that has been designed to look like stone. The section of wall south of Chestnut Street has been complete, and the north section will receive similar treatment.





## NRCS EARTH TEAM

by: Janette Leshner, District Conservationist, Natural Resources Conservation Service

### The Earth Needs You – Join Our Team!

We need your help in reducing soil erosion, conserving our water and improving its quality, and developing pride in our country's natural resource heritage. Your commitment to the Earth Team will help ensure that generations to come will enjoy America's bounty.

The Earth Team, the volunteer arm of the USDA Natural Resources Conservation Service (NRCS), is now recruiting volunteers in more than 3,000 locations across the country. Make a difference in your community – become an Earth Team Volunteer.

#### Who Can Volunteer?

Anyone 14 years of age or older and interested in conserving our precious natural resources can join the Earth Team. You can work part-time or full-time, outdoors or in a local NRCS office. You can volunteer as an individual or form/join a group.

#### Why Volunteer?

As a member of the Earth Team, you will work side-by-side with USDA Natural Resources Conservation Service professionals who are committed to helping people protect and conserve the Earth's natural resources. As a volunteer, you could have opportunities to gain professional work experience, discover a lifetime career, receive training, earn academic credit, fulfill service learning requirements, and meet people with similar interests. Whatever your talents or interests might be, there is a volunteer opportunity for you. Working together we can make a difference!

#### Kinds of Jobs Our Volunteers Do

As an Earth Team Volunteer, you'll work with professionals on conservation activities in your community. Whatever your talents or interests, there is a volunteer opportunity for you. Technical assistance is needed to plan, lay out, and design conservation practices; to make natural resource inventories; and to improve wildlife habitat. Schools and community groups benefit from the conservation tours and exhibits that volunteers can organize. Taking photographs, writing articles, speaking to community groups, and producing artwork and publications are some of the opportunities available. Office support services include opportunities in computer data entry, typing, filing, computer programming, and conservation information. There are opportunities for everyone.

For more information contact Janette Leshner, NRCS District Conservationist at 570-415-3117 or [Janette.Leshner@pa.usda.gov](mailto:Janette.Leshner@pa.usda.gov).



# MOSQUITO-BORNE DISEASE CONTROL PROGRAM UPDATE

by: Brandon Ball, Mosquito-borne Disease Control Program Coordinator

The Mosquito-borne Disease Control Program is up and running again. This year I am being assisted by seasonal technicians Tyler Heeter and Seth Andes. Tyler graduated from Penn State University with a degree in Wildlife and Fisheries Science. Tyler is focusing his efforts in Snyder and Union counties. Seth also graduated from Penn State University with a degree in Physics. Seth concentrates his efforts in Columbia and Montour counties. I focus my work here in Northumberland County. This allows me to remain central to the other four counties in case I am needed.

This May, we were able to attend Mosquito Academy, a 2-day training event hosted by the Department of Environmental Protection's West Nile Virus Program. This year, the event was held in McKean County in the small town of Eldred. During the event, we were able to spend a significant amount of time in the field putting Integrated Mosquito Management (IMM) principles to practice, and we also experienced several adult control trials. It was a great learning experience for me and the seasonal technicians, and will surely help us to be more effective in our roles back here in the 5-county area.

So far this season, we have conducted surveillance throughout the counties using a variety of traps. The first trap I'll discuss is the gravid trap. This trap is used to catch adult females that have already taken a bloodmeal from a host, such as a bird, mammal, or human, and are looking to find a body of stagnant water onto which they can lay their eggs. We fill the black bin shown in Figure 1 with a foul smelling, organic water. This is the type of bait that *Culex* mosquitoes love. When they fly down to get close to the water, they get sucked up inside. This is the most commonly used trap, and we get 99% of our West Nile Virus positive mosquitoes from this type of trap. If you happen to come across one of these in your travels, rest assured that it is not a bomb! There is no need to call the police.



Figure 1: Gravid Trap

The second trap I'll discuss is the BG-Sentinel host seeking trap. This trap is used



Figure 2: B-G Sentinel Trap

to catch adult female mosquitoes, (yes, just the females. The males do not bite you!), that are looking to take a bloodmeal. We use a combination of lures with this trap. An artificial human scent is added along with CO<sub>2</sub> in the form of dry ice. The sublimation of the dry ice mimics animal respiration, which the mosquitoes can sense. These lures, in conjunction with the color contrast of the trap, make this trap successful. This is the type of trap that we will set for nuisance complaints, and the counts from these traps are what we use when determining if an adult control application is necessary.

While both of these traps are used for adult surveillance, we use dippers to search for larvae/pupae in areas of standing water. When we see or get information on areas of standing water, we examine it to see if it is breeding mosquitoes. If larvae/pupae are found in a container, the best and simplest action to take is to dump the water. If this cannot be done, then

larvicides are the next action we take.

This summer, we are also dragging deciduous leaf litter in public use areas, such as parks and game lands, throughout the 5-county region to find nymphal *Ixodes scapularis* (black-legged tick). This effort is a continuation of the 2018 adult tick survey in which our county participated. The purpose of this surveillance is to determine the geographical and temporal patterns of the primary vectors of tickborne disease in Pennsylvania. By collecting the cohort stages associated with disease transmission, the hope is to correlate population density and infectivity with the onset of human illness. The reason we are looking for nymphs currently is because the nymphal stage is most active during the months of May through August. Due to its small size, the nymphal stage is very difficult to find if it attaches to your body. Always do a thorough body check when you are done with your outdoor activities. The black-legged tick needs to be attached for a full 24-hour period to transmit Lyme Disease. If you find a tick on your body and aren't sure how long it's been attached, remove the tick and go to your doctor.



Figure 3: Mosquito larvae in dipper cup



## MOSQUITO-BORNE DISEASE CONTROL UPDATE, cont.

They will most likely prescribe you Doxycycline. This is used to treat and prevent infections. If caught early, Lyme Disease can be treated successfully. For personal protection from ticks, look for products with the active ingredient Permethrin. This is to be sprayed onto shoes, clothing, and gear when not being worn and allowed to dry. Once dry, the molecules bind to the treated fabrics and act to repel and kill mosquitoes, ticks, and other invertebrate pests. The treatment is good for several washings as well.



Figure 4: Stages of the Blacklegged Tick

As always, our staff is available and willing to attend group meetings to educate the public about our program and best-management practices to reduce the risk of contracting mosquito-borne diseases. For now, we will continue to fight the rains and do our best to protect the public from mosquito-borne disease. If you have any questions or concerns, please feel free to contact us. Thank you, and I hope everyone enjoys their summer!

### This year's seasonal mosquito technicians:

Seth Andes (Columbia and Montour Counties)



Tyler Heeter (Snyder and Union Counties)



## POISON HEMLOCK

by: Pam Richardson, Civil Engineering Technician, Natural Resources Conservation Service

Poison Hemlock was in full bloom during the month of June. It is an opportunistic weed found in bare pastures and wet areas. Because of the wet spring, it is flourishing this year. ALL PARTS OF THIS PLANT (flowers, stems, roots, seeds) ARE HIGHLY POISONOUS/DEADLY TO HUMANS AND LIVESTOCK.

Learn to identify poison hemlock and take measures to control it on your property. Although control is best accomplished in May, before it blooms, control at any time of year is better than no control. See the Fact Sheet on the following pages which outlines identification and management of this weed.

Poison Hemlock (*Conium maculatum*) is a 'Class B Noxious Weed' in Pennsylvania. Control is highly encouraged.

# Invasive Plants in Pennsylvania

## Poison Hemlock

*Conium maculatum*



Pedro Tenorio-Lezama  
[www.forestryimages.org](http://www.forestryimages.org)

### Description:

Poison hemlock is a biennial herb with hollow, purple-spotted stems that can reach eight feet in height. Its finely dissected leaves emit a foul, parsnip-like odor when crushed. Plants begin as a rosette of leaves and flower in the second year of growth. The small, white flowers are borne in umbrella-shaped clusters.

### Biology and Spread:

A single poison hemlock plant can produce over 30,000 seeds. These seeds can adhere to farm machinery, vehicles, fur and clothing, as well as be carried by water, and to a limited extent, wind. Poison hemlock is capable of rapid establishment, particularly in disturbed sites.

### Background:

In the 1800s, poison hemlock was brought to the United States from Europe as an ornamental. In ancient times, it was probably used to poison Socrates, a famous Greek philosopher.

### Range:

Poison hemlock is native to Europe, western Asia and North Africa. It is now widespread throughout much of North America. It has also been introduced to other continents, such as South America and Australia.



Eric Coombs, Oregon Dept. of Ag.  
[www.forestryimages.org](http://www.forestryimages.org)

### Habitat:

This plant commonly occurs in dense stands along roadsides, field margins, irrigation ditches and waste areas. It also invades native plant communities in riparian woodlands, open floodplains and along stream banks.

### Ecological Threat:

Poison hemlock can be a tenacious weed, particularly in moist sites. As a pioneer species, it quickly colonizes disturbed sites, displacing natives. All parts of the plant, especially the seeds, are extremely poisonous to humans and livestock.



John D. Byrd, Mississippi State U.  
[www.forestryimages.org](http://www.forestryimages.org)



## How to Control this Species:

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### Physical

Hand-pulling works best for wet soils with small infestations. Because poison hemlock is not a perennial, removal of the entire root system is not necessary.

Mowing or cutting the plant close to the ground just before flowering is often effective, but may require retreatment if new growth is produced at the base.

Poison hemlock remains toxic for several years after being pulled. Ensure that the material is kept out of reach of children and wildlife.

### Chemical

The application of herbicides, such as glyphosate and 2,4-D can effectively control large infestations.

Complete eradication may be difficult if a viable seedbank is present.



Barry Rice, [sarracenia.com](http://sarracenia.com)  
[www.forestryimages.org](http://www.forestryimages.org)



Pedro Tenorio-Lezama  
[www.forestryimages.org](http://www.forestryimages.org)

## Look-A-Likes:

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Poison hemlock is sometimes confused with the invasive giant hogweed (*Heracleum mantegazzianum*) and our native water hemlock (*Cicuta maculata*). Deaths have occurred from mistaking the roots for wild carrots.



Steve Dewey, Utah State University  
[www.forestryimages.org](http://www.forestryimages.org)

## References:

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Center for Invasive Species and Ecosystem Health:

<http://www.invasive.org/browse/subinfo.cfm?sub=4365#maps>

USDA Forest Service: <http://www.invasive.org/weedcd/pdfs/wow/poison-hemlock.pdf>

## For More Information:

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DCNR Invasive Species Site: <http://www.dcnr.state.pa.us/conservationscience/invasivespecies/index.htm>

DCNR Invasive Exotic Plant Tutorial for Natural Lands Managers:  
[http://www.dcnr.state.pa.us/forestry/invasivetutorial/poison\\_hemlock.htm](http://www.dcnr.state.pa.us/forestry/invasivetutorial/poison_hemlock.htm)

# CENTRAL SUSQUEHANNA VALLEY THRUWAY

by: Michael McCleary, Erosion and Sedimentation Technician

**PHASE 4 OF THE NORTHERN SECTION OF THE CENTRAL SUSQUEHANNA VALLEY THRUWAY WILL SOON BEGIN.** Phase 4 will include final grading and paving of the road surface, completion of inlets and storm water pipes, and conversion of the sediment basins to retention basins.

**River Bridge:** Beams are being placed over Route 147.



The last 3 piers are under construction. After reinforcement bars have been installed, a steel form is placed over the reinforcement bars, and concrete will be poured for a 26' high section of the pier. The pier in the foreground will get 3 more sections before the buttress wings will be added to support the bridge deck.





## CENTRAL SUSQUEHANNA VALLEY THRUWAY, cont.

When the crane has positioned the form over the reinforcement bars, 2 men in each of the bucket trucks at each end of the pier must guide it down over them to ensure the reinforcement bars are in their proper position within the form. When the pier is complete, the reinforcement bars should be 3" inside the concrete on all sides.

**River Bridge:** The deck is being constructed on top of the piers on the west side of the Susquehanna River. When the decking has been completed, it will be covered with concrete to create the final surface of the bridge.



**Wooded Run Bridge:** The superstructure of this bridge is complete. The deck remains to be constructed.



**Bridge over relocated Ridge Road:** This bridge is nearly complete. The deck placement is nearly complete. Then it will be ready for final grading, paving, and seeding and mulching. Access ramps are being brought to final grade.



*(continued on next page)*

## CENTRAL SUSQUEHANNA VALLEY THRUWAY, cont.

**Phase 4 Final Grading:** When all structures are complete, the road surface and surrounding areas will be brought up to final grade. Inlets will be made functional, and paving will begin.



To expedite the paving process, a portable batch plant will be constructed near the SE off ramp to relocated Ridge Road. Ground is being prepared and conveyors and other equipment have been delivered for use in this facility. A portable batch plant on site will keep cement trucks off the local roads, thus reducing cost of transporting cement to the site.

### DEP ENVIRONMENTAL EDUCATION GRANTS AWARDED TO NCCD

*by: Chantel Shambach, Watershed Specialist*

Our organization's most noticeable attribute is our ability to install on-the-ground work. Though the efforts of field work are very important, our capacity goes way beyond that. Educational outreach is something the District also takes part in. The NCCD believes that this connection with the residents/youth is just as important as the field work, because the citizens/youth are the ones that will be living, benefiting, and inspiring their location more than anyone. That is why NCCD applied for three different Department of Environmental Protection (DEP) Educational Grants for 2019-2020. We are excited to announce that our proposals have been accepted to incorporate ground water education into our program, continue our annual Water Quality and Coal Mining History Field Trip, and hold a make-and-take rain barrel workshop.

One of the three grants awarded was the \$1,475 submission to purchase a ground water model. Humans sometimes have difficulty understanding things they cannot see, like groundwater. It's important to comprehend the significance that groundwater has on all our lives; especially for the residents of Pennsylvania. This form of drinking water is a vital survival resource for the vast majority of the 12 million occupants of Pennsylvania. Pennsylvania has 30 times more groundwater than it does surface water. Some of that groundwater is the direct drinking water supply to half of Pennsylvania's citizens. Out of the whole United States, Pennsylvania ranks only second (after Michigan) for the total number of wells, and third (after Wisconsin and New York) for number of public water supply wells. Education about groundwater is an indisputable necessity for the continual understanding of water as a valuable natural resource. Ground water is highly susceptible to human contamination, more often from nonpoint sources. Most of the in-school education on the hydrologic cycle is focused on the surface water movement and progression through the atmosphere. What about the transfer of water between the subsurface? The Sand & Gravel Groundwater Flow Simulator (shown in Figure 1) gives the visual perspective of what is transpiring below the surface. This cross-sectional view of the groundwater flow can be used to teach various important scientific concepts for many age groups. The model will provide a visual tool to help better understand the water table fluctuation through discharge and recharge areas, the different types of aquifers and wells, typical water quality of each aquifer under normal circumstances, and what an aquitard looks like and how it acts towards contaminants. It also allows for the observation of fluid permeability through different porosities of sediment and what the local sediment deposition layers may look like. Using the model can introduce the education on proper septic

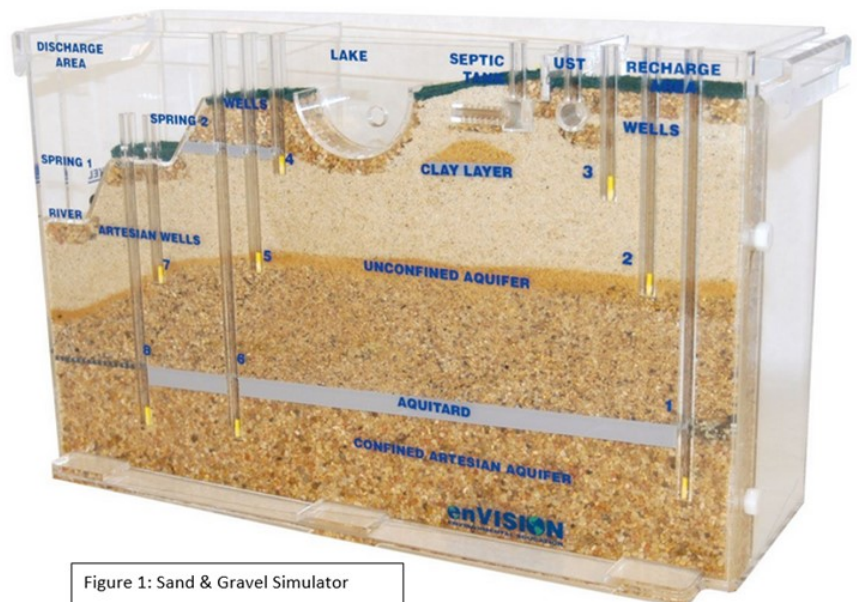


Figure 1: Sand & Gravel Simulator



## DEP ENVIRONMENTAL EDUCATION GRANTS, cont.

system/underground storage tank care, will offer recognition of how multiple source contaminants can yield significant impacts on drinking water or other hydrologic reservoirs, and can empower the discussion of identifying household hazardous waste and the proper disposal of such material.

Additionally, the District was also awarded \$1,340 to continue their educational connectivity with coal history and water quality. This 4<sup>th</sup> annual Water Quality and Coal Mining History Field Trip (also highlighted in our Winter 2018 Newsletter) is mostly held in Kulpmont Borough, but also involves a bus trip to Weiser State Forest. The Borough has a rich heritage as a former coal mining town with people of various nationalities whom settled there to work in the mines. This field day has allowed students to embrace the creation of this local town, but also sheds light on environmental stewardship practices to help preserve our water resources. The goals of this project are to provide several types of environmental education to 60 - 70 local students from Our Lady of Lourdes and Mount Carmel Area School District, and to add vegetation to a local tributary. Students will learn about the importance of the past coal mining activities of their area and observe a mining reclamation site which was turned into a local recreational field, known as the Veterans Memorial Sports Complex, located within Kulpmont Borough. Students will also learn how to complete a biological assessment of a stream, the value of watersheds and riparian buffers, and help to plant a vegetative buffer along Quaker Run. First, students will meet at Veterans Memorial Sports Complex to partake in three rotational stations to learn of the community's local coal mining history, presented by Shamokin Creek Restoration Alliance (SCRA), a local volunteer watershed group. The stations include a description of how the Complex was a coal mine processing plant which was restored to a recreational field through a Rural Abandoned Mine Program grant in 1981, view the large mural of the once Scott Colliery while listening to the presentation of its rich history, and an explanation of the impacts coal mining had on Quaker Run, a local tributary to Shamokin Creek. Currently, Quaker Run has only the recent trees and shrubs planted from previous events and does not sustain any macroinvertebrate life. After the first set of rotations, the students are bussed to Weiser State Forest to learn about watershed structure, macroinvertebrates, and the importance of riparian buffers. Students will also learn how to complete a biological assessment of a stream, the value of watersheds and riparian buffers, and help to plant a vegetative buffer along Quaker Run. While there, the students are encouraged to make the comparison of what a natural, healthy stream looks like in comparison to the possible future of the decimated stream channel of Quaker Run. Finally, the students are bussed back to Kulpmont to enjoy lunch and to have a hands-on experience of conducting an environmental influence by planting a riparian buffer themselves. If it wasn't for the tremendous collaborative efforts and passion of various organizations and local outfits, this field day would not be as successful as it has been.

Our final grant submission of \$735 was awarded to host a rain barrel educational event. Storm water is a significant problem to manage; its important to view issues related to run off and ways change can be implemented. One of those ways is to convey the use of green infrastructure by maximizing storm water as a resource through rain barrels. The workshop location is being generously donated by one of our local watershed groups. The Little Shamokin Creek Long Center for Environmental Stewardship and Education is an outdoor pavilion and will hold the approximately 2-hour long workshop. Having the presentation outdoors could offer an array of on-site learning opportunities while attendees construct their rain barrels. We can observe the pavilion's roofing system, where and how to properly place a rain barrel, and show the best areas they could direct overflow drainage using on-site examples.

The workshop is projected to occur Spring 2020 and will be advertised via press release, social media posts from our District's page(s), and NCCD's Winter Newsletter. Opening the session will be a presentation that will deliver educational details and tips about storm water management practices, the significant impacts that can be caused by impervious surfaces, contaminant reduction efforts humans can do to create change, ways to use harvested storm water, maintenance options, and how to construct the barrel. After the presentation, the participants will break out and have the pride of making their own barrels, using 55-gallon, food grade barrels to then take home with them.

The NCCD's educational attention is not restricted to only a select few audiences. The District has had experience with schools (grades K-12 and colleges), girl/boy scouts, libraries, churches, townships, and farming communities. If you are interested or know of any organizations that would benefit from the ground water model, we encourage you to reach out to the District to schedule a time for engagement. We also do other educational opportunities highlighting soil health, macroinvertebrates, wetlands, stormwater/impervious surfaces, and surface water quality. If you are interested in any of those topics as well, please reach out. We thank DEP for giving us the opportunity to conduct these projects, and we thank you for your continued environmental stewardship.

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### Northumberland County Conservation District

*The NCCD, formed in 1943 under the Conservation District Law, is a subdivision of state government and is one of 66 Conservation Districts throughout the state of Pennsylvania. The purpose of the Conservation District is to promote protection, maintenance, improvement, and wise use of the land, water, and other natural resources.*

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Tyler Heeter, Seth Andes: Mosquito-borne Disease Technicians

**NCCD Board of Directors Upcoming Meetings:**  
**September 5, October 3, November 7 at 7:00pm;**  
**all held at the NCCD EE Center**