Winter 2018 Newsletter
Volume 4, Issue 1

# Conservation Matters

### *Winter's Chill…*

Many occupations have busier times of the year than others. Spring, summer, and fall are probably our busiest seasons.

But conservation efforts should never quit. The health of our watersheds is just as important in January as it is in August. It's important that we keep this in mind while going about our daily activities during the winter months. Simple things like cleaning up after pets or being cautious about ice mix application can make a difference.

Winter's chill may put some events on the back burner, but the streams continue to flow. For this reason, conservation ALWAYS matters.

Enjoy the rest of your winter season.

Sincerely,
*Judy Becker*

## NCCD Changing Course with Ag Programs in 2018

On January 4, 2018, our Board of Directors held their annual reorganization meeting. This annual meeting sets the tone for the upcoming activities for the Conservation District in the new year. At this year's meeting, the Board made the decision to participate in the Chesapeake Bay farm inspections that have been in place since 2016. DEP has already had a presence in the county performing the inspections in the District's place. Starting July 1, 2018, the District will begin performing these inspections.

While doing these inspections it is the District's goal to eventually reach every farmer in Northumberland County. We want to know what each farmer's needs are and how we can help. If your farm is going to be inspected, you will be notified beforehand.

Another decision made at this meeting was to drop the Act 38 Nutrient Management program as of June 30, 2018. The main reason for this decision is due to a decrease in funding. If you are a CAO (concentrated animal operation) or a CAFO (concentrated animal feeding operation) and need assistance, including plan reviews, you will need to contact Michael Walker at 570-433-2640 x221 as of July 1, 2018.

If you have any questions about these changes, please contact our office at 570-495-4665 x305.

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*"Conservation Matters" is a quarterly newsletter published by the Northumberland Conservation District.*

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

# UPCOMING EVENTS OF POSSIBLE INTEREST

## Nature Book Club

*By: Carol Parenzan, Middle Susquehanna Riverkeeper*

The Middle Susquehanna Riverkeeper Association held their first inaugural meeting of its **Nature Book Club** in partnership with Otzinachson Group of the Sierra Club and Mondragon Books on Monday, January 29th at 7pm. The first book discussed was **The Riverkeepers** by John Cronin and Bobby Kennedy, Jr. Please keep an eye on their Facebook page, www.facebook.com/middlesusquehannariverkeeper, for future dates and times. Future meetings will also be held at the headquarters for Middle Susquehanna Riverkeeper at 112 Market Street in Sunbury. Parking is in the rear of the building. RSVP not required, but please check Facebook or call 570-768-6300 for any weather or scheduling challenges. NOTE: Mondragon Books has offered to help secure books for those wishing to purchase a copy. There are copies in the library system, too. This event is free. The Middle Susquehanna Riverkeeper Association, Inc. is dedicated to protecting, improving, and preserving the health of Pennsylvania's Middle Susquehanna River Watershed. They operate under the guidance of their umbrella organization, Waterkeeper Alliance.

## Spring Tree Seedling Sale

*By: Shirley Snyder, Administrative Assistant*

Spring is right around the corner, so that means that NCCD will soon be having their annual Tree Seedling Sale. Each year we offer a variety of evergreens, deciduous, ornamentals, flower bulbs, fruit trees, and small fruits. The items for this year's sale will be available **sometime in February**, so check our website for the brochure, or contact our office for more information. Remember, if you are on our newsletter mailing list that does not mean that you are automatically on our Tree Sale mailing list. Orders can be placed through March 19, 2018, and pick up days will be April 18-19 from 7:00 a.m.-7:00 p.m. at the Rockefeller Township building located at 538 Seven Points Road in Sunbury.

**SAVE THE DATE!**

**03.06.18**

***7th Annual Winter Forum***

**REVIVAL TABERNACLE**
***Watsontown, PA***

**MORE INFORMATION TO FOLLOW**

**SAVE THE DATE!**

*"Connecting Soils and Profits"*

The Soil Health Conference will be held *March 15th* at the Pine Barn Inn, Danville.

Speakers Ray Archuleta, Steve Groff and Dr. John Tooker will provide participants with a day full of exciting and interesting topics to help improve soil health on your farm.

*Contact our office for more information closer to the date.*

*(570) 415-3117*

*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 info@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.*

## State Conservation Commission Releases New Standard Animal Weights

*By: Bryanna Kenno, Former Agricultural Conservation Technician*

Earlier this year, the Pennsylvania State Conservation Commission (SCC) approved new Standard Animal Weights for use in manure and nutrient management. The new weights should be used to determine animal density if on farm animal weight records are not available. The animal weights will become effective on **October 1, 2019**, the start of crop year 2020. What does this mean for you, the farmer?

If you **are** an Act 38 Concentrated Animal Operation (CAO) with a Nutrient Management Plan (NMP), the new animal weights could bump you into the Concentrated Animal Feeding Operation (CAFO) requirements. The CAFO permit application deadline in relation to the new standard weights is April 1, 2019. To be sure this change does not affect you, reference the revised Agronomy Fact Sheet 54 online or visit your local county conservation district.

If you **are not** an Act 38 regulated operation and you currently utilize a Manure Management Plan (MMP), be sure the new animal weights do not bump you into the Act 38 program as a CAO of CAFO. Reference the revised Agronomy Fact Sheet 54 online or visit your local county conservation district.

How do I know if I need an MMP or an NMP? In relation to the Act 38 Nutrient Management Program, a farm that exceeds 2.0 Animal Equivalent Units (AEUs) per acre requires an NMP. An AEU is 1,000 pounds of live animal weight. If you do not have records of animal weights on your farm, you must utilize the revised animal weights from SCC. In order to determine if your farming operation exceeds 2.0 AEUs per acre, utilize the formula from Agronomy Fact Sheet 54 for each type of animal group:

**AEUs = [(Average # of animals) x (Animal Weight) / (1000)] X [# days the animals are on the operation per year / 365]**

Once you have determined the AEUs for each animal group, add up the values and divide by the total number of acres available for manure/nutrient application; both owned and rented acreages. If this value is under 2.0, you are not considered a CAO and continue utilizing your MMP. If this value is over 2.0, make an appointment at the conservation district to determine your next steps.

Determining AEUs can be tricky, and it is easy to confuse all of the lingo. If you have questions, or need further assistance, please do not hesitate to contact the District at (570) 495-4665! Make an appointment and be sure your animal density is accurate, and you are using the correct plan!

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## 2018 NCCD Board of Directors Reorganization

*By: Judy Becker, District Manager*

The NCCD Board of Directors held their annual reorganization meeting on Thursday, January 4th. We welcomed new public director, Natalie Wertman of Sunbury. We also welcomed back the reappointments of farmer director, John Kopp and commissioner director, Rich Shoch. Former public director, Dave Crowl, was also appointed as an Associate Director. NCCD Board meetings are held the first Thursday of every month. For more details, visit our website at www.nccdpa.org.

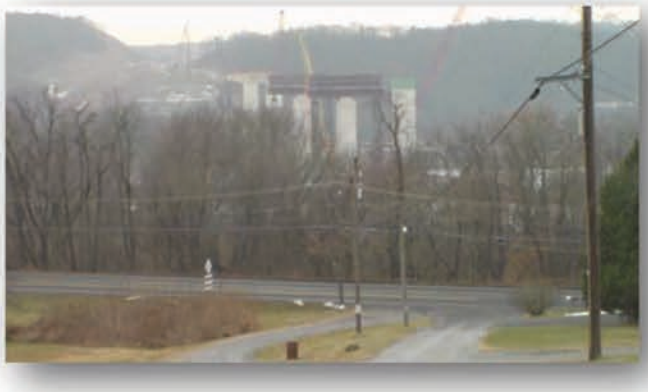
*Our 2018 Board of Directors from left to right, Gary Truckenmiller, Michael Hubler, Leon Wertz, Richard Daniels, John Kopp, Natalie Wertman, and Commissioner Richard Shoch.*

# PROGRESS ON THE CENTRAL SUSQUEHANNA VALLEY THRU-WAY

*by: Michael McCleary, Erosion and Sediment Technician*

**Piers for the bridge over the Susquehanna River:**

Work continues on the piers in the western half of the river. When this work is complete, the cofferdam will be moved to the eastern side of the river, and work will begin on the remaining piers. This is anticipated to take place in the summer of 2018.



**Eastern abutment for the bridge over the Susquehanna River:**

Forms and reinforcement bars are being installed so that concrete can be poured to create the eastern abutment to the river bridge. In preparation for this work, during October and November, 40 foot steel I-beams were driven into the earthen embankment to provide support for the concrete structures which will help to support the bridge.

*Abutment construction as viewed from above the project*



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# PROGRESS ON THE CENTRAL SUSQUEHANNA VALLEY THRU-WAY, *continued*

*Abutment construction as viewed from SR 0147*

**Ridge Road has been relocated and an interchange is under construction:**

Original Ridge Road west of the thru-way has been terminated with a cul-de-sac to facilitate turning vehicles around.

Relocated Ridge Road east of the thru-way. The original alignment can be seen on the right.

Work on the bridge over relocated Ridge Road has begun. Note the steel beam on the on the left side of the picture.

A view of the thru-way north of relocated Ridge Road.



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# PROGRESS ON THE CENTRAL SUSQUEHANNA VALLEY THRU-WAY,
*continued*

**The view from the bridge carrying Acorn Drive over the thru-way :**

Looking south toward Ridge Road.

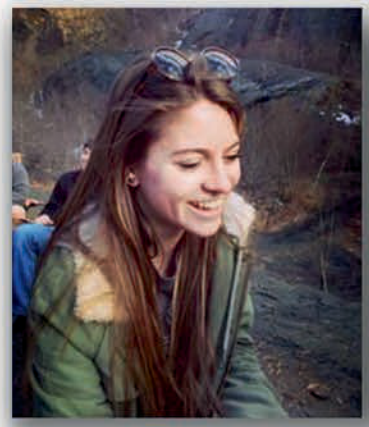
Looking north toward the bridges across the Chillisquaque Creek

**The bridges over Chillisquaque Creek:**

The bridge that will carry the northbound traffic on the thru-way has been completed and can be seen on the left in the picture above and below right. It is being used as a temporary route for all traffic while the existing bridge on SR 0147 is being replaced. The new bridge will carry the southbound traffic on the thru-way. Currently, crews are removing the road surface to expose the deck structure and will then begin demolition of the bridge support structure.

# DEVELOPING A "SENSE OF PLACE" FOR YOUR COMMUNITY

*by: Brianna Bonshock, NRCS Soil Conservation Pathways Intern*



Hello! My name is Brianna Bonshock, and I am currently a senior at Penn State University. I will be graduating in May with a Bachelor's degree in Environmental Resource Management and two minors in wildlife and fisheries science and psychology. In the summer of 2016, I had the opportunity to volunteer with the Northumberland County Conservation District on a stream improvement project in Irish Valley. Since this past September, I have been working under an internship position with the Natural Resources Conservation Service as a student trainee in soil conservation.

As a senior in college, I have worked on multiple projects over the last four years; some that were nothing but dreadful, yet others that were quite gratifying. One in particular that left a positive effect on me was a "sense of place" project that I completed during my junior year. This project incorporated personal research and utilized classroom knowledge in natural resource conservation and community sustainability to develop an appreciation and awareness for one's community. Developing a sense of place involves considering both the positive and negative characteristics of a community and what you can do personally to improve your community.

Growing up in the "Coal Region" of Northumberland County, the focus of my project was my hometown; Shamokin, PA. I have always taken pride in the heritage and small-town feel that the Shamokin area has provided. However, there are various needs and challenges that the city has faced in recent decades, due especially to the decline of the coal industry. Many of these challenges are of resource concerns.

Although coal was once king of the region, Shamokin was left environmentally impaired by the coal mining industry. Strip-mines were abandoned, leaving behind open pits that have since been impounded with water or exposed land that is now subject to heavy erosion and illegal dumping of garbage. While one of these locations, commonly known as the Whaleback, has presented a marvel and value to residents and geological scholars, many abandoned mine sites are dangerous and exhibit various natural resource concerns. An additional resource concern lies in the conditions of the Shamokin Creek. The quality of the creek has suffered significantly due to decades of mining and abandoned mine drainage discharges located throughout its watershed. Acid mine drainage that the creek faces contains toxic concentrations of acidity, metals, and sediment that cause impacts beyond the degree that aquatic life can tolerate.

My sense of place project provided me with immense historical insight of the Shamokin area. While the project has strengthened my adoration for my hometown, it has also educated me in the many environmental struggles that we as a community are up against. By becoming aware of and acknowledging natural resource concerns within my community, I am now more fortified with knowledge to take personal responsibility and help to improve such concerns. Following the completion of this project, I have a clearer understanding of the various ways that I can be a steward to our region's impacted land. I am committed to contribute to resource improvement efforts through involvement with restoration efforts within my community. I encourage everyone, in whichever community you call home, to develop your own sense of place, and discover the countless ways you can improve your community. I hope that you are able to bring out a better sense of community within yourself, as one has been brought to me.

## Linn Conservancy BILL Course: Designing a Native Plant Garden

*By: Diane Donato, Merrill Linn Conservancy*

The Merrill Linn Conservancy will host a six-week native gardening course for the Bucknell Institute of Lifelong Learning (BILL) spring 2018 session, beginning Thursday, March 1, at 3:30 pm. Classes will be held at The Public Library for Union County in Lewisburg.

The course, titled *Go Native! Design a native plant garden for beauty and biodiversity,* aims to instill appreciation of the aesthetics of natural landscapes and provide the knowledge and tools needed to design a site-specific native plant garden. It will stress the conservation benefits of native plant gardens, which are so effective in providing essential habitat for birds, butterflies, bees, and other pollinators.

*The native plant garden at East Buffalo Twp. is a volunteer project that promotes the Conservancy's Linking Landscapes Initiative. Marilyn Murphy, Stephen Miller, the garden's designer John Tonzetich, and Conservancy coordinator Geoff Goodenow were among those who turned out to spread mulch donated by Bucknell University.*

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## Linn Conservancy BILL Course: Designing a Native Plant Garden,

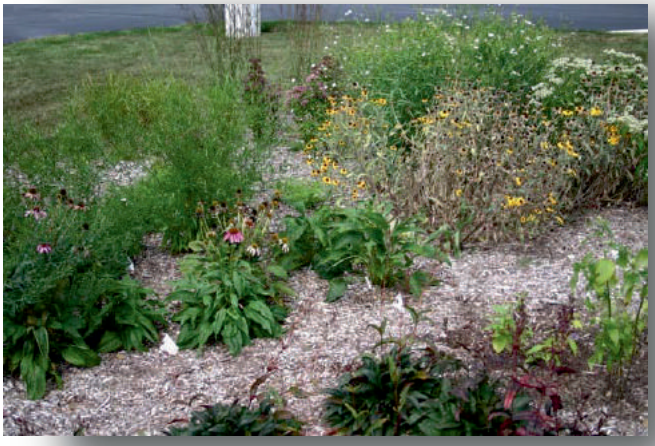
***continued***

As a pre-course assignment, each participant will be asked to create a rough map of an area (private or public) that he or she proposes converting to natural landscape. Maps would include length and width of the site, footprints of on-site structures, and designation of impervious surfaces as driveways, patios, and pools. A segment of each class will be reserved for developing the site maps into a comprehensive planting plan.

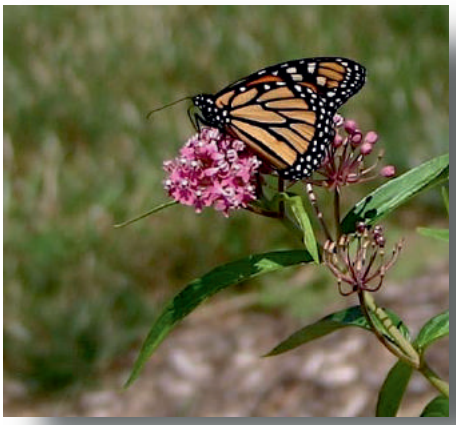
Course presenters will explore the essential role of native plants in local ecosystems and provide information that new-to-native gardeners need to design and install a natural landscape. The will include landscape architect and community planner Brian Auman, Conservancy Board member and retired Bucknell biology professor Warren Abrahamson, Master Gardener and retired Bucknell biology professor John Tonzetich, and Bill Deitrick, District Manager of the Union County Conservation District.

The Conservancy, which protects land in Union, Snyder, and upper Northumberland counties, encourages the conversion of properties to native landscapes through its Linking Landscapes Initiative. For information about BILL and its Spring 2018 courses, call 570-522-0105 or visit lifelonglearning@bucknell.edu.

*The 1,800 sq. ft. garden plot, shown in May after the installation of shrubs, grasses and some perennials, is surrounded by asphalt and concrete. Located next to EBT's recycling plant and nearby the Lewisburg Farmers Market, the site is highly visible.*



*The plants grew rapidly urged on by abundant rain and sunshine in the spring and early summer of 2017.*



*Monarchs, among other pollinators, visited the garden. Their larvae were found on milkweed.*

## Eels and Mussels and Water Quality

*By: Jaci Harner, Watershed Specialist*

I've had the pleasure of participating in two kayak trips down the Susquehanna River guided by Jim Charles who lives on the Isle of Que. Both times he guided us through an area that contained eel weirs, just downstream of the Fabridam. If not careful, your kayak could get hung up on the stone V-shaped dams changing the outcome of your relaxing trip down the Susquehanna. As we floated down the river, Jim explained eels were once abundant throughout the Susquehanna River, captured during the dark hours of night, and utilized as an important food source as well as a form of income for some folks. Eels also traveled up river and found useful habitat in the many adjoining streams throughout the Susquehanna watershed.

Eels are a catadromous fish species; they are born in seawater, migrate to fresh water where they spend most of their life cycle, then migrate 1,000 miles back to the Sargasso Sea in the heart of the Bermuda Triangle where they reproduce and die. The animals are nocturnal and can be found hovering around roots and rocks of riverbeds from the Gulf of Mexico to the St. Lawrence River in Canada. Unfortunately, like the American Shad, the American Eel population has declined significantly after several hydroelectric dams were installed along the Susquehanna river. These large structures prevent the migration of

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# Eels and Mussels and Water Quality,

*continued*

fish from one habitat to another. I do not deny the importance of these dams, but am sad to know the disruption they have caused for this important fish species and our river's ecosystem.

Eels have a special connection to a certain freshwater mussel, the Eastern elliptio. Mussel's spend the early part of their life cycle living on the eel; larvae temporarily attach to the gills or fins of the eels. When the mussels enter the juvenile stage, they drop off the eel and continue growing on the stream bottom. Other fish species can act as a "host" for the mussel larvae, but the Eastern elliptio mussel relies primarily on eels. This special relationship also allows mussels to hitch a ride upstream (or downstream) and into habitats that could not be reached by these microscopic organisms if they were simply released into the water. Unfortunately, hydro dams block eel migration to freshwater habitats, resulting in a decreased eel population in the Susquehanna watershed which in turn reduces the mussel population.

So how is this related to water quality? Mussels are filter feeders; they obtain their food by filtering organic matter or tiny organisms from the water. In addition, they filter sediment from the water column making it available for aquatic insects and other bottom dwelling organisms. In essence, mussels are a natural (and free!) filtering system, cleaning up our streams and rivers while filtering food and sediment from the water. Each adult mussel can filter about 18 gallons of water a day as it feeds. How does that convert to dollars and cents? Julie Devers of the U.S. Fish and Wildlife explained there are an estimated 280 million Eastern elliptio mussels in the Delaware River. (The Delaware River hasn't had the challenge of hydro dams like the Susquehanna River has; therefore, the Delaware River has a higher population of eels and mussels.) That many mussels can filter approximately 6 billion gallons of water, removing approximately 78 tons of sediment, thus performing $14,000 worth of water treatment per day. That's a major benefit to our local waterways.

But the numbers of Eastern elliptio mussels in the Susquehanna River watershed are down significantly and remaining populations are dominated by large, old mussels, with little sign of reproduction. Gone with them is an important water-cleansing capability.

Fortunately, the U.S. Fish and Wildlife Service has recognized this environmental challenge and has taken on the task of restocking eels in Central PA. Studies showed that Buffalo Creek and Pine Creek had higher existing mussel populations compared to surrounding streams, so stocking efforts were focused on these two streams. Stocking of eels began in 2010 and will continue for 10 years. Collecting eels is not complicated nor expensive. Biologists have found that young eels will follow a trickle of water that runs down rocky river slopes and slither up several feet of plastic conduit pipe into a holding tank where they await their ride upstream. Eels are collected below the Conowingo dam, which is in Maryland, and transported to PA waterways.

Research is showing the transported eels are traveling hundreds of miles to new territory throughout the watershed and growing rapidly. In addition, eels are being found with mussel larvae attached to their gills, which will promote the growth of the mussel population; all very positive signs for a restoration program.

So the big question remains: is it possible to meet the needs of society while maintaining the delicate balance of the natural environment? Ultimately, humans rely on natural resources for our survival. It is in our best interest to make sure we have clean, healthy resources for our continued existence. Luckily, the state of PA has been proactive about removing old, impractical dams. But it will take a continuous team effort from a variety of positions to identify and resolve sensitive issues that involve the advancement of society with environmental stewardship. This is not an easy task, to say the least. Time, money, human resources, and overall objectives are all important perspectives to consider. Perhaps we can learn something from the eels and mussels; it takes a cooperative, mutual relationship to move forward and ensure a productive, sustainable future.

# DIG A LITTLE, LEARN A LOT (PART 2)

*by: Janette Lesher, District Conservationist, NRCS*

Oh my, it's Cold Outside! What a perfect time to talk about staying covered! If you read my last article, you remember that healthy soils are 1- full of life, 2- high in organic matter, 3- covered all the time, and 4 - well structured. The last article I focused on being full of life. Let's skip to number 3 and talk about being covered all the time!

It is easy to see the importance of giving the soil protection above the ground, but it might not be as easy to recognize benefits living covers provide below the surface. The roots of living plants offer soil microbes their easiest, most reliable food source: sugars exuded by living roots! Soil microbes need a consistent food source throughout the year to thrive, so including cover crops throughout the growing season, or including perennial grasses and legumes in a rotation can help sustain them year-round. Living plants maintain a rhizosphere, an area of concentrated microbial activity close to the root. The rhizosphere is the most active part of the soil biology because it is where the most easy-to-eat food is available for microbes. It is critical for plant growth because those microbes, in turn, provide essential nutrient cycling for crops.


Most farmers who started with single species cover crops eventually move to mixes. Coincidence? Probably not. There have been identified advantages to using mixes. No one species can deliver all the advantages that multiple cover crops deliver in combinations. Some fix nitrogen, some are very good at scavenging nitrogen in the soil, and some have deeper roots than others that allow them to extend deeper into the soil profile, while others may control specific weeds or attract beneficial insects. Each plant species offers a different chemical signature to the soil through the rhizosphere which provides a different food source for bacteria and fungi in the soil. More variety in the food source creates more habitat for greater variety of soil organisms. Using cover crops also puts organic matter production on the fast track! A diversity of plants above ground creates underground habitat with a healthy balance of predator and prey organisms in the soil. The result is improved nutrient cycling!

As I traveled around Northumberland County this late fall/early winter, I asked producers that have been growing cover crops what they would tell other producers, and here are some of the responses I received:

- "You will get results. But, it takes a system approach. Plan ahead."
- "Don't let anyone put you in a box. Take a leap of faith and try something new."
- "All good things take time, be patient and consistent with planting cover crops. There is a transition time, but your soils will begin to adjust and you will reap the benefits."
- "Use what you have. Be creative. Try something new."

Rye cover crop after soybeans in lower North'd county

Multi-species cover crop after wheat in lower North'd county

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# DIG A LITTLE, LEARN A LOT, *continued*

Multi-species cover crop after small grain in northern North'd county.

Cover crop management today is not just a revisiting of old practices abandoned by your father or grandfather. Farmers have started integrating cover crops that may have never even been considered before into their operations. When looking at cover crops to build soil health, you should go into it with eyes wide open.

Five of the most important questions you should ask yourself are:

1. What equipment is available (owned, available for rent or customer hire) to seed cover crops in my area.

2. What windows of opportunity exist as defined by weather and climate, current cropping practices, cover crop genetics - and can current windows be expanded by acceptable adjustments like shorter season crops or alternative cover cops?

3. How will I terminate the cover crop and achieve an acceptable stand of the next crop?

4. Will I have the time and labor to make this work?

5. What's my contingency plan – and risks – if the cover crop doesn't establish or doesn't die on schedule?

We have heard it said over and over before, that seed sitting in the bag is not going to do any good. We need to get it planted – at least give it a try!

I continue to be fascinated and excited about what the producers in Northumberland County are trying and discovering with cover crops! I encourage all the producers who are currently cover cropping to keep up the good work and try something new. To any producers who have not yet adopted cover crops or are looking for some new ideas/techniques, please contact my office and we would be happy to assist you in coming up with a plan for your individual operation!

***Janette Lesher,***
***NRCS District Conservationist***


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# THE INVASIAN OF THE ASIAN TIGER MOSQUITO

*by: Corey Bower, Mosquito-borne Disease Control Coordinator*

## Introduction

As winter breezes through, the District's Mosquito-borne Disease Control Program has been working on reviewing current literature and analyzing past seasons' data to determine trends and become better informed and prepared. This past season, our team identified a ferocious and highly invasive pest, *Aedes albopictus,* also known as the Asian tiger mosquito in three of its five designated counties (refer to Figure 2). Native to the tropical regions of Southeast Asia, China, and Japan, *Ae. albopictus* was first documented in the United States in Texas in 1985 (*7*). It became established through international travel and trade, particularly through imported used tires. It has since spread like wildfire across the Eastern, Midwest and Pacific coastal regions of the United States (refer to Figure 1, D). In fact, this species has been identified as one of the 100 most successful invasive species in the world and has colonized all continents except Antarctica during the past 30-40 years (*1*). Aside from being one of the most invasive species on the planet, the Asian tiger mosquito is of major concern as both a nuisance and vector species. As if their aggressive and unpleasant biting habit wasn't enough, they have also been found to transmit at least 26 arboviruses; effective in transmitting chikungunya, Zika, and dengue. Its ability to invade and persist in temperate areas, such as Pennsylvania, causes serious concerns for its potential role in disease transmission.


## Distribution

In a 2017 report from the Center for Disease Control (CDC) published in the Journal of Medical Entomology, officials have mapped the presence of *Ae. Albopictus* using county-level data from January 1995 to March 2016 (refer to Figure 1). Between January 1995 and December 1999, occurrence of *Ae. albopictus* was reported from 370 counties (Figure 1, A). The most recent analysis between January 1995 and March 2016 has identified 1,241 counties from 40 states and the District of Columbia that have reported occurrences. However, the Northcentral Region's Mosquito-borne Disease control program has discovered and mapped an additional county to be added to the list and three others in need of revision (Figure 3). Prior to March of 2016 there have been 5 trap collections of *Ae. albopictus* for a total of 7 collected specimens; 4 adults and 3 larvae. Since March of 2016, however, there have been a total of 38 trap collections of *Ae. albopictus* for a total of 97 collected specimens; 91 adults and 6 larvae.

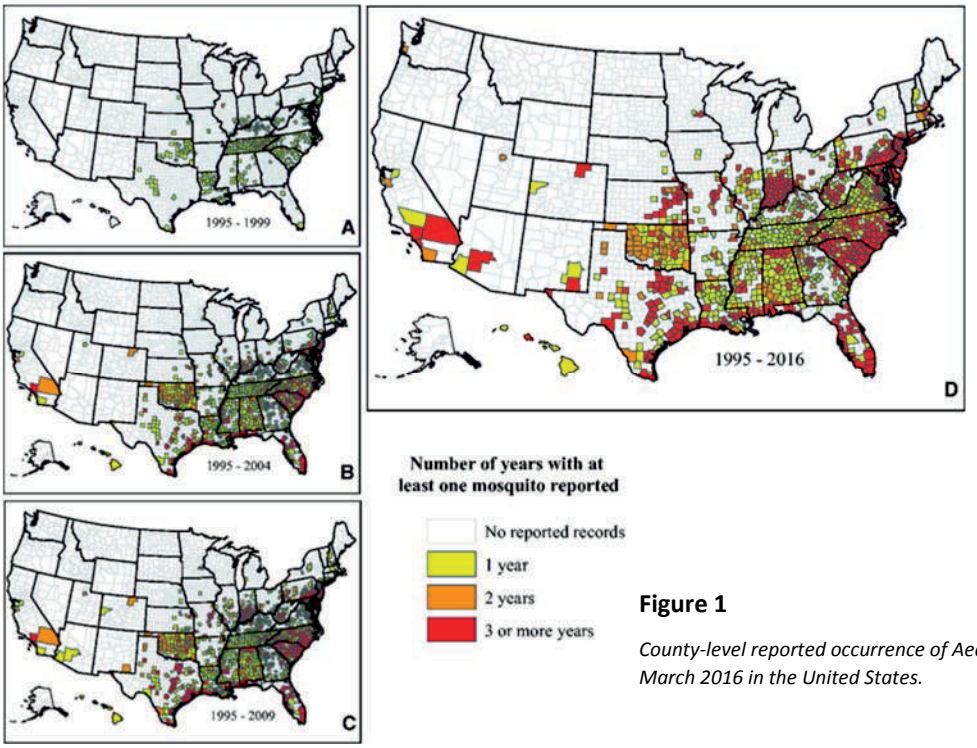


**Figure 1**

*County-level reported occurrence of Aedes albopictus by the CDC between January 1995 and March 2016 in the United States.*

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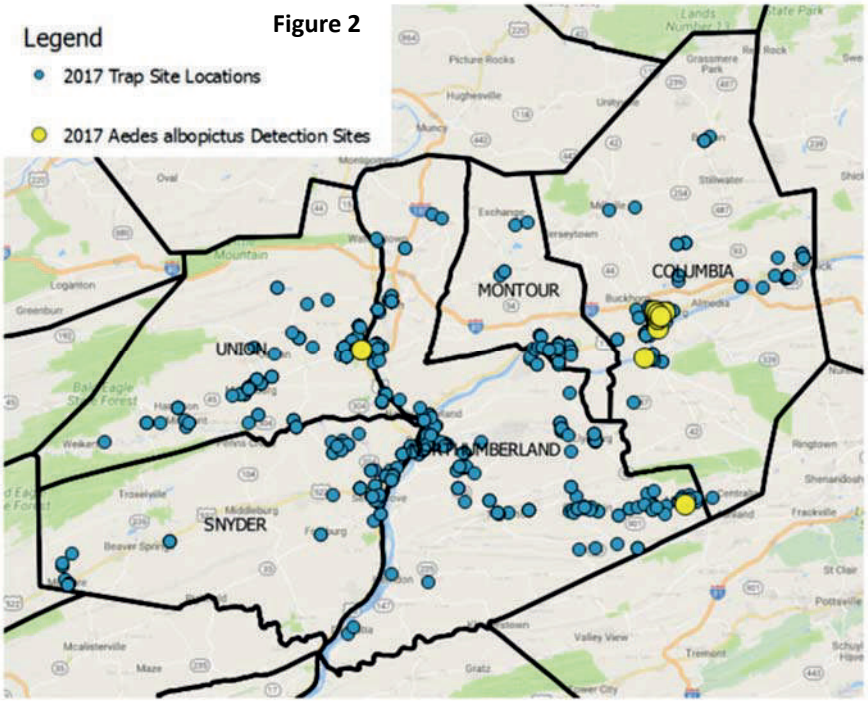
# THE INVASIAN OF THE ASIAN TIGER MOSQUITO,

*continued*

The Asian tiger mosquito is an aggressive daytime feeder, found in shady areas where they take refuge from the desiccating sun. The females feed on a wide host range which includes humans, animals, and birds. However, it can be highly human favoring when hosts are available (7). In fact, the traps set by the District uses a "human scent lure" to attract them. In addition, its life cycle is closely associated with human habitat. Compared with rural and suburban areas, urban areas have more *Ae. albopictus* larval habitats, shorter larval development time, higher adult emergence rate, and longer lifespan (2). They use natural and artificial water-holding containers, such as tree holes, used tires, plastic containers, and clogged gutters to lay their eggs. Their attraction to human-made containers and environments allow this species to quickly spread and expand its range. The Northcentral Region's collection points of *Ae. albopictus* support this anthropophilic relationship, where collections are in towns or cities with the highest population density; Bloomsburg, Lewisburg, and Selinsgrove (refer to Figures 2 and 4). These collections are also close to interstates and highways which coincides with a 1997 CDC study finding that most cities with detected *Ae. albopictus* are in the path of major transportation routes (4). In fact, many egg masses and larvae have been found in gas station windshield wash receptacles with detergent along interstate highways, likely hitchhikers from endemic regions (Dr. Dina Fonseca, personal communication, 2017). This introduction can also be found in regions where tires are delivered or where tire dumps exist, which may explain the detections in the southern part of Northumberland County in regions like Mt. Carmel and Shamokin (refer to Figure 4). It is also interesting to note that the major cities with detections; Bloomsburg, Lewisburg, and Selinsgrove, all have universities; Bloomsburg University, Bucknell University, and Susquehanna University, respectively. This may be due to the influx of students who commute from areas with highly established endemic populations of *Ae. albopictus*, such as Philadelphia, Harrisburg, and most of New Jersey.

**Figure 2**




*Detection of Aedes albopictus locations throughout the Northcentral region in comparison with all set trap locations during the 2017 mosquito season. Map created in QGIS by Corey Bower.*

## Disease Transmission

Taber *et al* highlight the significant public health concerns of *Ae. albopictus* due to its high transmission capability of dengue fever virus (DENV), as well as Zika virus, chikungunya virus, and LaCrosse viruses. Although DENV has been nearly absent from the US for the last 60 years, local transmission of DNV within the past 15 years resulted in outbreaks in Hawaii, Texas, and Florida. There have been nearly 90 imported DENV cases reported in PA from 2010 through 2014, although, to date, no locally transmitted cases of DENV have yet been reported (5).

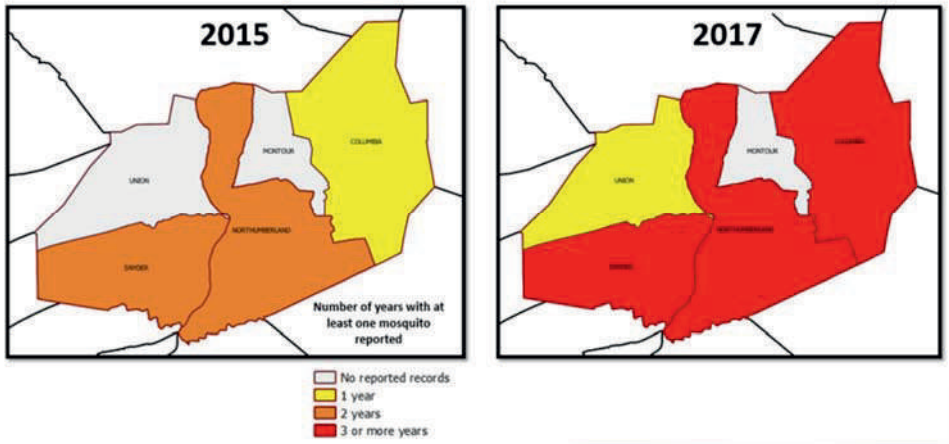



**Figure 3** *Comparative map of the Northcentral region from December 2015 to December 2017 depicting the number of years with at least one Aedes albopictus mosquito reported. Map created in QGIS by Corey Bower.*

*(continued on next page)*

# THE INVASIAN OF THE ASIAN TIGER MOSQUITO,

*continued*

However, since DENV is frequently asymptomatic, many travelers are unaware they harbor the virus. Therefore, travel related introductions of DENV could result in periodic local transmission during summer months where *Ae. albopictus* are present. In addition, Pennsylvania has identified a total of 182 Zika virus disease cases and 50 infection cases from 2015-2018 (health.pa.gov, 2018), which could also cause potential outbreaks similar to DENV.

## Discussion

It is essential to highlight that the Northcentral region does not likely have an established population of *Ae. albopictus,* but rather a continually introduced population. This can be inferred due to their very limited flight range of 200m or less, the lack of continued perennial data, and the cold winters our region endures. Although *Ae. albopictus* eggs, particularly those in temperate regions like PA, can survive extreme temperatures of 14° F for 24 hours and a mean monthly winter temperature of 23° F (5), it's unlikely they've survived the brutal arctic blast our regions incurred this winter. However, it should be noted that in Pennsylvania, where the average monthly minimum winter (December-February) temperatures were as low as 20°F, *Ae. albopictus* were able to survive. In addition, with a sizable percentage of the US population living in areas where these mosquitoes persist and the incessant traveling we all do, the challenge will be to fend off or mitigate recurring reintroductions. The best way to do this is through public awareness and education. Continued surveillance and the public's help of locating where these mosquitoes, or "disease vectors", thrive is essential in helping our team understand where to extend surveillance and potential control efforts to reduce human risk.

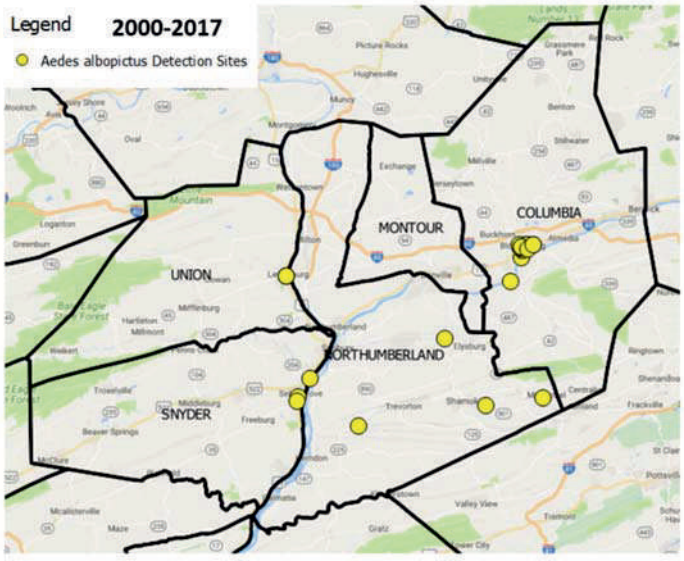



**Figure 4** *Map of Northcentral region displaying all Aedes albopictus collection sites from January 2000 to January 2017. Map created in QGIS by Corey Bower.*

It is important to be informed; use the correct mosquito repellent (DEET), drain or dump standing water on your property, and be mosquito-aware even during daylight hours in the mapped areas in Figure 4. Although their invasion may be inevitable, we can all take measures to be good neighbors and prevent them from becoming established. Please call our District office at 570-495-4665 if you believe you have identified the Asian tiger mosquito or have any mosquito-related complaints. For more mosquito related information, please visit our website at www.nccdpa.org or http://www.westnile.state.pa.us/.

*"That which can be foreseen can be prevented" – Dr. Will Mayo*

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# APRIL 12, 2018
# THE WOMAN FARMER AWAKENING

## Hibernation is over!

Capital RC&D and the USDA Natural Resources Conservation Service invite you to come and start a fresh growing season with new tools, ideas, and support from your local conservation team. Learn about opportunities **for** women farmers **from** women farmers, ways to have your voice heard, financial assistance programs, grants, and more. Meet your local partners in conservation that are willing to give you a hand. We'll push up our sleeves to talk about how we as women farmers can work together to influence local initiatives and policies to improve our farming business, families, and community. All farmers are welcome to attend, and registration is free. Seating is limited.

The USDA is an equal opportunity provider, employer, and lender.

**SAVE THE DATE!**

**Nurturing Your Land & Sustaining Your Farming Business**

**Keynote Speaker Hannah Smith-Brubaker, Exec Director of PASA**

**9 am – 3:30 pm**

**Free Registration Includes Lunch!**

*Reserve your seat now:*
christine.nickey@pa.usda.gov
570-524-2549 x100

**LOCATION:**
155 N 15th St
Lewisburg, PA 17837

More details to come!

To receive updates, email abigail.appleman@pa.usda.gov

**Northumberland County Conservation District**
441 Plum Creek Road
Sunbury, PA 17801
Phone: (570) 495-4665
Website: www.nccdpa.org

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Corey Bower: Mosquito-borne Disease Control Coordinator

**NCCD Board of Directors Upcoming Meetings:**
**March 1, April 5 at 12:30pm; May 3 at 7:00pm**
**all held at the NCCD EE Center**

**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.*