

# The Pennsylvania Vector

Spreading News to the Vector Control Community

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## Inside this issue:

Pennsylvania Boy's Award-Winning App is the Bee's Knees	2
Lyme and Tick-Borne Diseases in New York: State Senators Call for Statewide Action Plan	3
What's Up: Region 1	4
What's Up: Region 2	4
What's Up: Region 3	5
What's Up: Region 4	6
What's Up: Region 5	6
NH DHHS Identifies Second Jamestown Canyon Virus Case	7
What's Up: Region 6	8
"i5k" is for Insects	10
Disease-carrying Mosquitoes Abound in Deforested Lands	11
Dare 2B Tick Aware	12
Sustaining Members	15-19
President's Corner	20
Editor's Corner	20

### Special points of interest:

- **Bowling Party details on page 11**
- **Conference Pesticide Recertification Credits on page 14**
- **Calendar of upcoming events on page 16**
- **AMCA Annual Washington Conference on page 20**

## How Pet Snakes Set Off an Unlikely Chain of Events That Could Make You Sick

Opossums, raccoons and deer all but disappeared from Everglades National Park in Florida after the Burmese python invaded. When they vanished, mosquitos turned to feeding on rats that can carry encephalitis. That could put humans at risk.

Sometime in the 1980s, it became cool to own a pet reptile in Florida. Cooler still was owning one from far away, like from Madagascar, Egypt or Burma. The more exotic, the better. Thousands of cold-blooded creatures moved through Miami's international airport to their new glass-box homes.

The Burmese python — which can be draped around a neck — was especially popular. A baby python is just 10 inches in length. Much to the surprise of some of their owners, those babies could grow up to 20 times that size.

Maybe it was those overwhelmed owners who let their snakes loose. Maybe it was Hurricane Andrew, which destroyed a reptile breeding facility in 1992 and might have sent its specimens into the wild. One way or another, by the early 2000s, Everglades National Park was teeming with giant non-native pythons, which strangled, and then gobbled whole, almost anything in sight.

Foxes and rabbits, which once commonly roamed the park, appeared to have vanished. Deer, raccoon and opossum populations dwindled by as much as 99 percent. The snakes targeted more than mammals: Once, a 13-foot python ate an entire six-foot alligator before exploding.

In 2015, Bob McCleery, an associate professor of wildlife ecology and conservation at the University of Florida, sent 26 rabbits into the Everglades. Three-quarters of his tracking devices — along with the rabbits — ended up in the stomachs of the snakes. "The best explanation for the rapid decline of most mammals throughout southern Florida is pythons," Dr. McCleery said. Most of the mammals, he said, are simply gone. But not all of them.

One hardy species endured the invasion: the hispid cotton rat. There are a number of theories about why the rat survived. It could be that its population was already dense and abundant, or that its predators — foxes and bobcats — were eliminated. Or it could be that the hispid  
*(Continued on Page 9)*

INCIDENTALLY,  
THE HISPID RAT  
IS ONE OF THE  
ONLY KNOWN  
CARRIERS OF  
EVERGLADES  
VIRUS —



## Pennsylvania Boy's Award-Winning App is the Bee's Knees

Submitted by: **Connie Schmotzer**

Outside of Nazareth lives a merry young genius named Kedar Narayan, who wants to replace every manicured lawn in the country — even the world — with a pollinator garden irresistible to birds and bees.

Kedar will be 9 on his next birthday, in September, and by that time you may be able to download the mobile app he created to help people make this horticultural transformation as quick and efficient as possible, so the pollinators of the world — bees and hummingbirds and so on — have more places to go.

The app, which is in the running for an enormous cash prize, will be for everyone. But it is geared especially toward children of the current generation who, in Kedar's judgment, aren't as environmentally conscious as you might expect given the attention that topic gets in school.

"A lot of kids don't even care about the environment," he said, relaxing — almost — on a sofa in his Lower Nazareth Township home and recounting a story about some friends who carelessly kicked over flowers and didn't seem to feel at all sorry.

"No one really tells them what the environment does," he said. "They don't know how everything is connected. When one part of the ecosystem goes down, everything goes down with it."

This is how Kedar converses, so insightfully and eloquently that you begin to forget he is 8. But he has always been quite a bit older than his years. He began assembling 100-piece puzzles at 2 and was doing three-digit addition in his head by 5.

He is also a masterful computer coder. His nickname is Little Code Ninja. He was only 5 when he

started to learn this craft. His video game console broke and his mother, Anita, who home-schools him, told him it wasn't the end of the world, he could learn to code and make his own video games.

Anita is a computer scientist, so Kedar had a good teacher. To say he had a knack for it is like saying Mozart had a knack for music. Before long he designed a 3D board game, Storibot, to teach other children how to code, and he made it rich with tactile elements so visually impaired children could play.

The invention landed him on a talk show hosted by comedian Steve Harvey. It also won four awards at this year's National Invention Convention and Entrepreneurship Expo at the U.S. Patent and Trademark Office headquarters in Alexandria, Virginia.

All in a day's work. "He's very strong-willed," Anita Narayan said. "You give him material and he learns on his own."



In a June 23, 2017 photo, Kedar Narayan, 8, of Lower Nazareth, sits on the lawn near his pollinator garden. Narayan has developed an app that helps people create a pollinator friendly lawn including information on native plants and where to buy them. Kedar wants to replace every manicured lawn in the country and the world with a well-designed garden. Narayan is a computer coder and has a nickname Code Ninja. (April Bartholomew/The Morning Call via AP) The Associated Press

Kedar said the idea for his Pollinator Garden App occurred to him a few months ago. His parents had been taking him to a lot of fairs where he showed people how to code, but then his mother gave birth to his baby brother and couldn't take him anymore. "I was looking for something fun to do so I started gardening," he said.

Because Kedar does nothing in half measures, he sought the counsel of Penn State master gardeners and county agricultural extension agents and set about learning the fundamentals, then the particulars, of horticulture.

"That's when I realized how wasteful lawns were," he said. Wasteful indeed. Lawns are swaths of empty space where blue false indigo and wild columbine and white penstemon might otherwise grow and provide pollen to the creatures that carry it around and make other things grow.

Not just bees, either, though they are certainly the best known and busiest of the breed. "There are many pollinators," Kedar said. "Hummingbirds, which are things people really want. Butterflies, for example. The wind is a pollinator. That's actually new to me." Without pollinators, he added, we may as well hang it up, because there wouldn't be any food.

Beyond that, people tend to slather lawns with pesticides and weed killers. Kedar's father, Kartik, is a biochemist, so, as with computer coding, Kedar had a good home resource to teach him the environmental effects of those.

Now, you can't just willy-nilly plant a bunch of flowers. One of the features of Kedar's app is a list of plants native to a specified area. These are best to plant because they don't need to adjust to the climate and require less tending.

Connie Schmotzer, a Penn State  
(Continued on Page 9)

## Lyme and Tick-Borne Diseases in New York: State Senators Call for Statewide Action Plan

Submitted by: Tom Smith

Senator Sue Serino (R, C, I-Hyde Park) and Senator Kemp Hannon (R-Nassau) today released a comprehensive report aimed at combating the spread of Lyme and tick-borne diseases (TBDs) in the state. Based on the findings presented at a public hearing convened by the senators, the report highlights the immediate need for a statewide action plan, as well as a legislative commitment to empowering patients and funding critically necessary research to reduce the tick population.

Senator Sue Serino, Chair of the Task Force on Lyme and Tick-Borne Diseases, said, “With yet another Powassan virus diagnosis in the state—this time in Dutchess County—and countless New Yorkers suffering from Lyme and other tick-borne diseases, it is imperative that the state makes combatting these devastating diseases a top priority. While progress has been made since the formation of the Task Force, this report provides a much needed road map to take our work to the next level, and I implore the Governor and our colleagues in both houses to join us in the fight to take control of this public health crisis.”

Senator Kemp Hannon, Chair of the Senate Standing Committee on Health, said, “With New York sitting at the epicenter of the tick-borne disease epidemic we have a duty to engage partners at every level to act swiftly and efficiently to improve outcomes for the thousands of patients suffering around the state. Armed with the information gleaned from the hearing, we have put together a comprehensive strategy that can help inform the Department of Health as they develop a critically necessary statewide action plan. We stand ready to work with them—and our colleagues in the Legislature—to see that our recommendations become a reali-

ty.” The August public hearing convened experts in the field, medical professionals, insurance industry representatives, patients, and advocates to develop effective solutions to empower patients and prevent New Yorkers from contracting the diseases.

As tick-borne disease rates increase across the state, it is clear that New York is facing a direct threat that requires a significant investment to improve identification techniques, reporting and treatment options.

Testimony provided by patients at the hearing painted a grave picture of life with a tick-borne illness. Patients described agonizing pain, dangerous loss of memory and motor skills, financial ruin as a result of a severe lack of effective treatment options, and more. A common theme that ran throughout patient testimony was the rampant inaccuracies plaguing the test currently used to detect TBDs, with some suffering with symptoms for years before an accurate diagnosis and treatment.



To address this point, the report includes a recommendation for the state to create specific protocol when it comes to notifying individuals of their diagnoses. Senators Hannon and Serino have introduced legislation that would require the state to develop that specific protocol to guide providers in properly diagnosing and treating Lyme and TBDs and require them to provide patients with a notification form to better educate them about their test results.

It is commonly accepted that Lyme

disease can be effectively treated with antibiotics if detected early. However, as was discussed by many hearing witnesses, the test used to detect Lyme disease is simply not reliable. Too often patients are led to believe that they are in the clear after receiving a ‘negative’ serology test for Lyme disease, which ultimately delays critical treatment resulting in worsening—sometimes irreversible—symptoms. The bill (S.6926) would arm patients with the information they need to more effectively advocate for themselves and receive swift, effective treatment.

Additionally, the Task Force recommends the following:

- Creation of a Statewide Action Plan and Dedication of Significant Funding in preparation for the 2019 Executive Budget Cycle;

- Reinstituting the NYS Health Quality Cost Containment Commission to accurately assess the cost of insurance and consider coverage for long-term treatment of symptoms;

- Promote testing in children who present with TBD related symptoms to ensure swift treatment and avoid the long-term consequences of misdiagnosis;

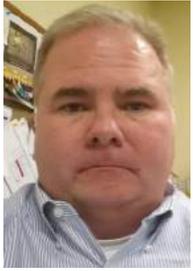
- More effectively utilize proven information systems, information technology and social media to increase awareness about the dangers of Lyme and TBDs; and

- Actively pursue outside funding to invigorate critical research.

Article Credit: Senate Report Task Force on Lyme Tick-Borne Diseases by New York Senate on Scribd, <http://outbreaknewstoday.com/lyme-tick-borne-diseases-new-york-state-senators-call-statewide-action-plan-29434/> Image Credit: Elionas

## What's Happening in Region 1

Submitted by Ray Delaney



Bucks county recorded the most positive mosquito pools in our program history. Also the most positive traps at 162. Also ran limited Altosid 5 liquid larvicide

ULV events, with some good results. Department will be conducting additional larvicidal ULV events in 2018 under the observa-

tion of DEP in more controlled events.

Delaware County had no reported human cases of West Nile Virus in 2017, although a relatively high number of positive mosquitoes were collected in July, August, and September. Complaints from county residents were mostly a result of the large *Aedes albopictus* population in the area. Breeding locations for these mosquitos are characteristically cryptic in Delaware County,

which makes control efforts uniquely challenging. Neighborhoods which appear relatively well maintained and free of refuse, tire piles, etc. may still produce high numbers of Asian Tiger mosquitoes in BG sentinel traps. Thus, one of our primary strategies has been to educate the area residents by distributing informational brochures.

## What's Happening in Region 2

Submitted by Louise Bugbee



**Who will save the fleas?**

It's best to start at the beginning, with the WN human case report.

The Northeast had three human cases this year; total for the State was 17. While the goal is always to have zero people infected, 17 for the entire state is pretty good. I had to reflect on some of the past years data to put it in perspective. Numbers ranged from 0 in 2000 to a staggering 237 in 2003. I am sure there are a lot of us who still remember that year. We were scrambling. But the program has evolved and protocols are proving to be effective. It shows that it takes time, dedication and continuity to build a successful mosquito control agency. And with that in mind, it is good to report that Northampton County is back in the swing and now the entire Lehigh Valley can get the service they deserve as the third largest metropolitan area of the State.

In addition to Northampton, Mon-

roe, Lackawanna, Lehigh and Luzerne received grant funding for 2017. 1,392 pools of mosquitoes were tested from the region with a total of 191 positives. Luzerne accomplished two truck mounted adult control events. All the counties were busy with larvicide treatments, educational events and clean-ups.

Pennsylvania is still Number One in the Tick Arena. The Lehigh Valley Health Network, which covers most of the NE Region, had 1200 patients test positive for Lyme Disease between January and July of 2017. That number is nearly double the positive tests from the same time in 2016. St. Luke's University Health Network which covers the same area, performed 7,604 Lyme tests during that period (results not available) but hospital officials claim that is one of the highest volumes in recent history. The DNA Wildlife Lab at East Stroudsburg tested 2,226 from the Region. The numbers just keep on rising.

Dr. Marten Edwards' ongoing research in the Lehigh Valley reports a 26% infection rate for *Borrelia burgdorferi*, the highest in four years

of testing. Results for additional pathogen tests are not yet complete. It would be so helpful if we could have reliable data about infection rates for all parts of the state. The most convincing information we can give the public is a number they can understand. If you can confidently say that one in five ticks collected in any defined area carry the Lyme bacterium, people listen. Their eyes get wide and you can almost see the light bulb going on in their heads. Generalized platitudes about precautions and tucking your pants into your socks just don't carry the weight of a real number.

The Black fly program completed all scheduled treatments in the region. Complaints were minimal from the residents.

The most up-to-date PA DOH rabies report was June 2017. At that time there were 20 cases in the NE Region. We can definitely add at least two more to that count for the skunk and the raccoon collected from residential neighborhoods in the City of Bethlehem. Both tested positive for rabies

(Continued on Page 5)

(Continued from Page 4)

and both came into contact with domestic dogs. One lucky dog was vaccinated, the other was not. The owners were advised to euthanize him but decided to vaccinate immediately, quarantine him and do the “wait and see.” The outcome is unknown.

Speaking of dogs, which also frequently cohabit with cats, fleas seem have been a problem for a lot of cat people this summer. We don’t talk much about fleas. Maybe we should. The tiny tenacious *Ctenocephalides felis* can drive humans to distraction, especially when the cat is strictly an indoor pet. It often takes pet owners by surprise. Fleas can be brought in by visiting animals or picked up at the vet. It is claimed to be possible to transport them on clothing or shoes. At this time of year, as the weather cools, I think a more probable route of entry is on the mice that are coming in to seek shelter.

But, however they get established, getting rid of them can be expensive, time-consuming and frustrating.

This spurred me to investigate the Flea Circus. Yes, it is true. People abuse fleas by wrapping very thin gold wires around their necks and attaching them to various props such as a tiny cart, which the poor flea has to pull around until it dies from exhaustion. They are confined for life in these harnesses for the amusement of nearsighted audiences. They might be glued to a base with a teeny musi-

cal instrument fastened to their abdomens which they then appear to “play” when the base is heated and they attempt to escape. Who came up with this idea you may wonder. Not Barnum. Not Bailey. Not the Ringling Brothers. It was watchmakers in the 16th Century as a way to showcase their intricate metalworking skills. Maybe ticks can be added to the side-show. They’re strong. They could be the weightlifters. It takes a lot of force to crush a tick. PETA has succeeded in saving animals from sad circus lives. Who will save the fleas?



## What’s Happening in Region 3

Submitted by : Katie Seymore



Region 3 was again busy with plenty of positive mosquito samples. York was ranked 2nd in the state for virus activity, with Adams 4th; Cumberland 6th;

Dauphin 8th; Berks 10th; Lebanon 12th; Lancaster 13th; Franklin 18th; and Blair 24th. Berks, Cumberland, and Dauphin each had to respond to a human case this summer.

This year, Cumberland County received its first confirmation in five years of a horse that tested positive for West Nile Virus. In 2012 and 2005, there was one confirmed positive each year compared to 2003 when there were 19 confirmed horse positive confirmations for West Nile Virus (oh the

wonder of vaccinations!). Franklin, Lancaster, Mifflin Counties also responded to horse positive cases this year. Bird samples tested positive for WNV in Berks, Blair, Cumberland, and Perry. Once again, a big thanks to Region 3’s DEP coordinators, Christian Boyer and Jen Stough, for all their help this summer.

Berks County conducted mosquito habitat reduction with a tire collection which yielded nearly 2,800 tires. This included some very large farm and construction implement tires, for a total of over 120,000 pounds of tires from 40 different municipalities which were recycled and not out in the landscape breeding mosquitoes.

This fall in Adams County, I was invited to spend a day at Gettysburg Middle school with 300 science students. These kids were attentive and interactive as we talked about mosquito

awareness, habitat reduction, and integrated pest management in both the classroom and outside demonstrations. While walking with the kids, some expressed awe that I could play outside all day for a job, while others squeamishly asked how I could touch dead insects, much less work with thousands of live ones. Oh well, you can’t win them all over.

This was my last season in the mosquito business, as I have taken a position with the DEP Regional Permitting Offices. I will miss the Program and all of the dedicated people who sweat all summer long to keep the public safe and are not afraid to raise a pitcher to a job well done. Thank you! One final comment, congratulations to Jen Stough, to starting a new position in the Central Office Vector Management.

## What's Happening in Region 4

Submitted by Christian Boyer



The 2017 mosquito season was the most active in terms of virus prevalence in the history of the Mosquito Borne Disease Pro-

gram in Region 4. A total of 204 positive pools were reported from 7 counties. This is 4 more than in 2012. The county accounting for most positives was Union (55). Lycoming, Northumberland, and Centre also had active years having 46, 36, and 21 positive pools respectively. Centre County collected the earliest positive in the history of Region 4 on May 23rd. All positives were isolated from either *Culex pipiens* or *Culex restuans*.

There were 2 confirmed human cases reported this year as well. These were the first confirmed reports of human infection in Region 4 since 2007. One case was reported from Northumberland County, and the other from Clinton County. Each of these cases have since recovered.

There were 38 birds tested this year in the region. Of those, 16 tested positive most of which were American Crows. All the positive birds came from Centre County except for one that was reported from Union County. There were also 2 veterinary samples from Snyder County that tested positive this year.

Columbia County has seen an expansion of *Aedes albopictus* in the Town of Bloomsburg. *Aedes albopictus* was first collected in the county in 2012 when 3 specimens were collected from a light trap. None were collected after that until late in 2016 when a total of 6 were found at 3 different sites in Bloomsburg. During the 2017 season, a total of 78 specimens were collected throughout the season beginning in June. It will be interesting to see in the coming seasons if *Aedes albopictus* are able to continue to establish their population in Columbia County.

All county personnel did a great job this year dealing with the elevated virus activity, especially since this was the first year for many of them in the Mosquito Borne Disease Program. It has been a long time since Region 4

had to deal with constant positive activity. Everyone did a great job at prioritizing their surveillance efforts, and made educated decisions when conducting adult control events.

Doug Orr provided the following information about the Black Fly program.

In 2017 the Black Fly Suppression Program treated the West Branch Susquehanna River, North Branch Susquehanna River, Pine Creek and Loyalsock Creek in the Northcentral Region of PA. From early April through mid-September a total of 344 larval/pupal samples and 415 adult samples were collected in the Region to track black fly populations. The Northcentral Region only conducted four spray operations in 2017. As funding continues to remain flat and Program costs increase, fewer sprays will be conducted and each operation will treat fewer sites. In 2010 the West Branch of the Susquehanna River was treated 12 times, whereas in 2017 it was only treated four times.

## What's Happening in Region 5

Submitted by Mary Vibostok



As the 2017 mosquito season comes to a close, the SW Region looks back and reflects on the many changes that occurred this year. While it was busi-

ness as usual in the counties of Allegheny, Beaver, and Fayette, additional programs were funded for the counties of Greene, Washington and Westmoreland.

Some brief updates from counties in the SW Region:

In Allegheny County in 2017, there was one reported human case of West Nile, one positive bird, and 58 positive mosquito samples (or 72 positive pools). 3 adult ULV truck mounted control events were conducted in August in response to positive activity.

Cambria County had 16 positive mosquito pools. No human cases were reported and no positive avian or veterinary samples.

In Westmoreland County there were 586 mosquito samples collected at 61 sites. In addition, 16 positive pools and two human cases were reported.

Educational events were scheduled throughout the mosquito season with approximately, 35 county residents in attendance. Informational booths were set up at the Westmoreland Fair and New Alexandria "Safety Palooza".

From the desk of Bryan Diehl, SW Regional West Nile Virus Coordinator:

I would like to thank all of the SW Regional Mosquito Disease Control Program staff for their hard work and dedication in 2017. We were fortunate to be able to offer  
(Continued on Page 7)

*(Continued from Page 6)*

grants to Westmoreland, Greene, & Washington Counties this season along with Allegheny, Beaver, Cambria, & Fayette Counties. It should be noted that Greene County hasn't had a MDC grant for several years, but the Greene County Conservation District continued to participate in the program by conducting gravid trapping and monitoring during that time. I would like to thank Lisa Snider, Zack Basinger, interns and all the GCCD staff for their continued support and participation in the program during those years. The program set a county record in 2017 in positive mosquito pools, and they continue to monitor the spread of *Aedes albopictus* throughout their county.

I would also like to acknowledge the new county staff members in the SW Region in 2017. In Westmoreland County, a large county geographically that has many unique and diverse communities-- from rural farmlands to urban cities. Chelsea Gross began work with the Westmoreland Conservation District in May, obtained her Pesticide Applicator's Certification, and conducted educational events while continuing surveillance, control, and response to complaints throughout the county. Washington County and Fayette County operate as a joint program funded through

the Fayette County MDC grant and operated by the Fayette County Penn State Cooperative Extension. Ken Hess was challenged with being the sole field staff in both Fayette and Washington Counties until July when Cassidy Slivensky came on board. Ken did an amazing job juggling the responsibility of trapping the fixed sites in two counties in addition to responding to complaints and conducting control. Cassidy quickly learned the ropes and throughout the season, maintained a high trap count average as well as collecting quite a few positive mosquito pools. She ended her seasonal work at the end of September, but we really appreciate the service she provided to the people of Washington County.

A big THANK YOU also goes out to the MDC programs in Allegheny, Cambria, and Beaver Counties. Bill Todaro, Leah Lamonte, Mary Vibostok, Phoebe Prince, and Susan Boser do an excellent job year after year, and their knowledge, dedication, and service is top notch.

I would like to take a moment to reflect on the career of a good friend and the best partner you ask for. Ed Farrell is retiring in early 2018, so his many years of "skeeter beating" have come to a close. 2017 marked the eighteenth consecutive mosquito season Ed and I have worked together

in one form or another, and it has been my pleasure and joy to work alongside such a genuinely great man for nearly two decades. In my years as an intern, I was a typical, immature, young guy. Eighteen years later, and I'm still as immature as any twenty something guy, but through his example and leadership I have transformed into what I hope many consider a knowledgeable and experienced colleague. I have learned much in my time working with him. Here are just a few notes:

- \* Maintain your dedication to hard work, honesty, & faith in God, and all things will work out in the end.
- \* Don't sweat the small stuff, and take responsibility for your actions.
- \* Dedicate time to your family. Time passes quickly, and kids grow up in no time. You don't want to miss it.
- \* Practice being patient with others, and set a good example. Kindness & goodwill to people will open doors that are often otherwise locked.

Please join me in wishing Ed nothing but happiness in retirement and many days of quality bike riding & fishing! Ed is truly one-in-a-million. Thank you, Eddie, for being such a great influence & partner.

## NH DHHS Identifies Second Jamestown Canyon Virus Case

Submitted by: Tom Smith

The New Hampshire Department of Health and Human Services (DHHS) has identified a second case of Jamestown Canyon virus (JCV) in an adult from Goffstown, according to a press statement. The first human case of JCV in New Hampshire this season was confirmed in mid-August in Hanover. JCV is a mosquito-borne pathogen that circulates widely in North America primarily between deer and a variety of mosquito species, but it can also infect humans.

Reports of JCV in humans are rare

and most reported illnesses caused by Jamestown Canyon virus have been mild, but moderate-to-severe central nervous system involvement has been reported.

It is likely that this case was acquired in New Hampshire, but due to recent travel, location of exposure is not certain.

"As we head into the fall, it's important for people to remember that mosquito-borne diseases like Jamestown Canyon Virus are still a risk in

New Hampshire," said State Epidemiologist Dr. Benjamin Chan. "We want residents and visitors to *(Continued on Page 10)*



# What's Happening in Region 6

Submitted by Ted Bean



Mosquitoes: Surveillance and testing was limited in the Northwest region of Pennsylvania in 2017. Butler county shows 7 positive West Nile

Virus (WNV) mosquito pools out of only 15 pools tested which is 46 % positive. Erie County had 2 WNV positive pools out of 119 tested, Lawrence had 31 WNV positive pools out of 277 tested. Note that this data is early and may not be complete. Erie County reports a very quiet year for mosquitoes with only 2 birds and 2 mosquitoes tested positive for WNV. There were very few mosquitoes in the traps and very few complaints from the public.

Ticks: Statistics are not available yet for 2017 but data from 2013-16 show a disturbing jump in Lyme disease cases especially from 2015 to 2016. A whopping 68.5 % increase from 2015 n to 2016 ! Early tick collection numbers would indicate another jump in 2107 is probable.

Many Northwest Pennsylvania Counties are working hard to spread the word, through an awareness campaign, Ticks can now be found everywhere. They are showing up in many different areas . They are in people's back yards, trails, campgrounds, parks, etc.

Erie County installed about 60 signs in local parks, with advice on how to prevent getting ticks. Other counties have done likewise. There is also a

Northwest Region of PA	Lyme disease cases
2016	1608
2015	954
2014	901
2013	921

state-wide, Tick Task Force that is conducting studies through local universities. Erie County started a new tick data base for tracking ticks submitted for Identification. Below are results so far in 2017:

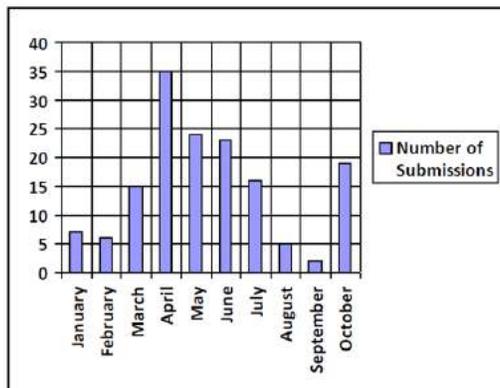
## Number of Tick Program Submissions by Month

From 1/1/2017 to 12/31/2017

Month	Total	Percent
January	7	4.61%
February	6	3.95%
March	15	9.87%
April	35	23.03%
May	24	15.79%
June	23	15.13%
July	16	10.53%
August	5	3.29%
September	2	1.32%
October	19	12.50%

Total Number of Submissions **152**

**100.00%**



*(Continued from Page 1)*

cotton rat reproduces even more prolifically than rabbits. (A female can breed again within a few hours of giving birth.)

The rat is also one of the only known hosts of a particular strain of the Venezuelan equine encephalitis complex, known as the Everglades virus, which is spread by mosquitoes. And, with fewer big mammals to feed on, the native Everglades mosquito had fewer choices for its next meal.

According to a new study, the amount of rat blood in the Everglades mosquito's diet has quadrupled since 1979.

"We were as surprised by the results as anyone else would be," said Nathan Burkett-Cadena, an assistant professor of entomology at the University of Florida, whose research, published this week in the journal *Biology Letters*, looks at whether invasive species could increase the risk of disease for humans by setting off such chains of events.

In humans, the Everglades virus can cause fever, headache and in some cases encephalitis, a swelling of the brain.

"I don't think that anyone could have predicted that this large snake, decimating some native mammals in a relatively wild area, could have some kind of cascading impact for human health," Dr. Burkett-Cadena said.

While no known human outbreaks have occurred in Florida, Dr. Burkett-Cadena and his team pieced together information from Venezuela, Guatemala and Mexico, where it is thought that viruses in the same family may have spread from rats to people. Together with three of his students, Dr. Burkett-Cadena spent five months collecting "blood-engorged females" from the Everglades and Vero Beach, Fla., to see whether the mosquitoes' eating habits changed at snake-infested sites. (Only females drink blood, in preparation for egg-laying.)

"We never get to sit down and talk to a mosquito and say, 'Hey, you feeling okay? Let me feel your forehead — seems like you've got Everglades. Do

you remember what animal you bit last?'" he said.

Dr. McCleery, who was not involved in his colleague's study, said the missing mammals would have far-reaching impacts. "As ecologists, we've known that this is really bad for some time," he said. "You can't completely alter an ecosystem and not expect that there won't be other implications that will impact humans."

Kenneth L. Gage, an entomologist and ecologist at the Centers for Disease Control and Prevention, said exotic species could disturb ecosystems in ways that humans could not anticipate.

"We have no idea, really, what we're doing when we move all these animals and pathogens around the planet," Dr. Gage said.

Article Credit: Livia Albeck-Ripka, *New York Times*, 10/7/2017, <https://www.nytimes.com/interactive/2017/10/07/climate/everglades-pythons-mosquitoes.html>. Image Credit: Liana Finck.

*(Continued from Page 2)*

Extension Agent in York County who oversees the state's pollinator garden certification program, said Kedar contacted her to find out all he could about gardens. "He wanted to have what he was doing dovetail with what we do," she said. "He was looking for good information to put in the app. He didn't want this to just be fun and games, he wanted it to have some substance." "I think what he's doing for such a young fellow is pretty neat," Schmotzer added.

Kedar entered the app in the Paradigm Challenge sponsored by Project Paradigm, a private foundation that supports innovators who want to tackle the world's biggest challenges. This year's contest theme was reduction of waste.

Michelle Fishburne, the foundation's outreach officer, said entries submitted from children 4 to 18 years old are scrutinized by a "blue ribbon panel of judges" and winnowed down to a finalists' field in three age groups.

"The quality of entries we receive are really strong," Fishburne said.

"Students are excited to have an opportunity to solve real-world problems, so they put a lot of effort into it. They care about making a difference in the world. It's not often that us adults ask kids to solve big problems, but when we do, they usually surprise us." Kedar won first place in his 4-8 age group. Now he's up against winners from two other age groups for the \$100,000 Paradigm Challenge Prize to be awarded July 29 at a black-tie ceremony in Los Angeles.

It would be a nice foundation for his

plan to become a fabulously rich philanthropist in the manner of Warren Buffett. He has been watching the investment wizard's animated "Secret Billionaire's Club" since he was 6.

But the money is almost beside the point.

"I'm also hoping to make new friends," Kedar said, "and to make people more aware."

Article Credit: By Daniel Patrick Sheehan, *The Morning Call* - <https://www.usnews.com/news/best-states/pennsylvania/articles/2017-07-01/pennsylvania-boys-award-winning-app-is-the-bees-knees>

## "i5k" is for Insects

Submitted by: Tom Smith

Nearly 75 percent of all animal species are insects and other arthropods. Many profoundly impact people and the Earth's ecology.

Some insects pollinate a third of our food crops. Others destroy one-fifth of the world's total crop production annually.

Given the importance of arthropods, the Agricultural Research Service (ARS) helped organize the "i5k Initiative." The goal is to sequence and analyze the genomes of at least 5,000 arthropod species that are important to both agriculture and biological research.



The "i5k Initiative" aims to sequence and analyze the genomes of at least 5,000 important insect species.

Resistance to pesticides used to control arthropod damage to livestock and crops is an evolving problem.

Solutions to such challenges lie in the genomes of pests and their hosts. This is where we will find new ways to manage them, explained Kevin Hackett, ARS national program leader for entomology and i5k co-founder and co-chair.

Arthropods' massive numbers means fewer scientists and resources available to work on each species. The i5k project virtually connects scientists from around the world to leverage resources and foster discussions.

Far from ivory tower exercises, i5k genomics are leading to advances that dovetail with today's headlines. A spike in ticks this summer made news. Ticks were also among i5k's successes.

When ARS insect physiologist Felix Guerrero and his team sequenced the cattle tick genome, they identified genes now being used to develop a vaccine against cattle fever ticks. This vaccine may protect cattle from several fatal tick-borne diseases and eventually fight ticks that spread

Lyme disease to people.

Parallel with the i5k initiative, ARS's National Agricultural Library (NAL) built the "i5k Workspace@NAL," which provides an online "toolshed" in which researchers work cooperatively to sequence genomes. It ensures wide access to data in a place that researchers see as neutral ground for collaboration, explained NAL project co-lead Christopher Childers.

The i5k Workspace@NAL works. In April 2017, more than 60 scientists from 7 countries and institutions, including ARS, collectively published an analysis of 14,220 genes in the bed bug's genome. This research is a foundation for new bed bug control methods.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in agricultural research results in \$20 of economic impact.

Reference: USDA AgResearch magazine, September 2017. By J. Kim Kaplan, ARS Office of Communications  
<https://agresearchmag.ars.usda.gov/2017/sep/genomics/>

*(Continued from Page 7)*  
 continue to enjoy the outdoors, but they should take steps to protect themselves from mosquito bites as long as mosquitoes are still around."

Until the second hard frost of the season, residents and visitors to New Hampshire should continue to protect themselves and their family members from mosquito-borne diseases by using an effective mosquito repellent that contains 30 percent DEET, wearing long sleeves and pants at dawn and dusk when mosquitoes are

most active, and removing standing water from around your home so mosquitoes do not have a place to breed. Repellents with picaridin, IR3535 and some oil of lemon eucalyptus and para-menthane-diol products also provide protection against mosquito bites. A hard frost is defined as two consecutive hours of temperatures below 28 degrees Fahrenheit.

Anyone with questions about arboviral diseases can call the New Hampshire Bureau of Infectious Disease Control at 603-271-4496. More information is available on the

DHHS website at:

[dhhs.nh.gov/dphs/cdcs/documents/jamestown-canyon-virus.pdf](https://dhhs.nh.gov/dphs/cdcs/documents/jamestown-canyon-virus.pdf) and on the Centers for Disease Control and Prevention website at [cdc.gov](http://cdc.gov).

Article Credit: Tony Schinella, Bedford Patch, <https://patch.com/new-hampshire/bedford-nh/nh-dhhs-identifies-second-jamestown-canyon-virus-case>

## Disease-carrying Mosquitoes Abound in Deforested Lands

Submitted by: Diane Oleson

Most disease-transmitting mosquito species live in deforested areas, a finding that may influence decisions on where and when to cut down trees, a new University of Florida study shows.

Deforestation occurs when people remove trees to make way for neighborhoods, farms, shopping centers and other land uses, said Nathan Burkett-Cadena, a UF/IFAS entomologist and lead author of the study.

For their study, Burkett-Cadena and Amy Vittor, a UF assistant professor of infectious diseases and global medicine, synthesized and examined data from prior studies that had looked at how many pathogen-carrying mosquito species made their homes in forested lands vs. non-forested lands in 12 countries worldwide, including the United States.

They found that about half -- 52.9 percent -- of the species were more abundant in deforested habitats. Of those species that favored deforested areas, more than half -- 56.5 percent -- carry viruses harmful to humans, the study showed. More importantly, all of the species that carry multiple human pathogens were more common in deforested land, said Burkett-Cadena, a faculty member at the UF/IFAS Florida

Medical Entomology Laboratory in Vero Beach, Florida.

"This research shows that when we convert forest to other uses, we make habitat for the mosquitoes that carry our diseases," said Burkett-Cadena. "The takeaway message is that our forests provide benefits above and beyond the biodiversity they sustain, the products they provide -- such as food, lumber and medicine -- and the recreational opportunities that they provide. Forests are poor habitat for most of our disease-carrying mosquitoes."

"Humans need to take this into account as we make decisions and policies about what we do with our remaining forests," Burkett-Cadena said. "Given



"This research shows that when we convert forest to other uses, we make habitat for the mosquitoes that carry our diseases," said Nathan Burkett-Cadena, an assistant professor of entomology at UF/IFAS. Photo Credit: UF/IFAS.

the rapid pace of global land-use change and deforestation, it is imperative that these dynamics are better understood to mitigate disease risk and guide land-use policy."

Mosquito-borne diseases account for more than 17 percent of infectious diseases in people, according to the World Health Organization. The most common virus, dengue, is estimated to infect 390 million people per year, according to a 2013 study led by an Oxford University researcher.

The UF/IFAS study is published in the journal *Basic and Applied Ecology*.

Article Credit: Science Daily, <https://www.sciencedaily.com/releases/2017/10/171009093247.htm>

Story Source: Materials provided by University of Florida Institute of Food and Agricultural Sciences. Original written by Brad Buck. Note: Content may be edited for style and length.

Journal Reference: Nathan D. Burkett-Cadena, Amy Y. Vittor. Deforestation and vector-borne disease: forest conversion favors important mosquito vectors of human pathogens. *Basic and Applied Ecology*, 2017; DOI: 10.1016/j.baae.2017.09.012

***We had such a good time last year -- we're doing it again!***



**Bowling - Tuesday, November 7th, 6:00 - 9:00**

**(shoes and ball included)**

**Billiards all night long or just come hang-out with your fellow Buggists!**

**Food and Soft Drinks Provided**

**Alcohol on your own**

## Dare 2B Tick Aware

Submitted by: Amy Tiehel



Pennsylvania is #1 in the nation in reported cases of Lyme disease. Lyme and other diseases you can get from ticks can become serious if not diagnosed and treated early. Preventing tick bites, and recognizing early illness are the most critical steps to preventing Lyme and tick borne disease. “Even with our #1 status, prevention is not top of mind for many Pennsylvanians, and yet taking just a few steps can reduce the risk of a tick bite by as much as 90%”, says Julia Wagner, President of PA Lyme Resource Network (PA Lyme). This information needs to get out there, in practical, easy to use ways. That is what Dare 2B Tick Aware is all about.

In 2017, PA Lyme ([www.palyme.org](http://www.palyme.org)) was asked to be the lead vendor for the Pennsylvania Department of Health to implement a statewide, community-based “Dare 2B Tick Aware” Lyme Disease Awareness and Education prevention program. DARE captures key prevention actions:

- DEFEND** yourself and property
- AVOID** tick habitat
- REMEMBER** tick checks and shower
- ELIMINATE** ticks correctly

This program is designed to standardize the prevention information being shared across the state, to increase reach into communities and, most importantly, to improve prevention action.

The approved PA Lyme program will roll out in phases. Phase 1 launches the standardized prevention workshops and materials, making them available for state-wide distribution, while Phase 2 expands the outreach campaign, and programs including a school-based program.

Workshops are presented by certified Dare 2B Tick Aware faculty, which includes certified health educators, academics, healthcare professionals and PA Lyme regional leaders. We currently have a faculty of 30, representing regions across the entire state.

**Opportunity:** we are currently looking for faculty candidates for 2018 workshops, in the North Central PA and North West PA regions. Facilitators must be certified via a four-step process (below). If you are interested in becoming a certified Dare 2B Tick Aware Prevention Seminar Facilitator please email [info@palyme.org](mailto:info@palyme.org) and we will email you a facilitator application.

### Workshop Facilitator Certification Process:

- 1. Program Overview:** candidate participates in an introductory session to review the program, purpose, and logistics.
- 2. Program Walk-Thru:** candidate participates in virtual presentation reviewing presentation and materials with a certified PA Lyme seminar facilitator.
- 3. Observation:** candidate observes a seminar in their region.

*(Continued on Page 13)*

*(Continued from Page 12)*

- 4. Teach back:** candidate presents the “Dare 2B Tick Aware” presentation for an audience, with a PA Lyme certified reviewer, and will receive feedback, and their certification.

**Workshop/Presentation Content includes:**

Ticks (PA Ticks, Habitat, Life Cycle)

Tick-borne Diseases

Preventing Tick Bites

**D**- defend yourself and property

**A** – avoid tick habitat

**R** – remember to check and shower

**E** – eliminate ticks effectively

Acting if Bitten by a Tick

Recognizing Early Symptoms (Seeking Help – Medical Care & Resources)

**Web-Page Link:** check out our Dare 2B Tick Aware web page at <http://palyme.org/dare-2B-tick-aware.html> where you can read more about the program, and book a free workshop.

**Prevention Materials Available Now**

These materials and web content are available now to share with your community. Email [info@palyme.org](mailto:info@palyme.org) to order materials.

PA Tick ID card (pictures of ticks in PA and the diseases they carry)

2-sided basic “Prevention Tip” card

Program Flyer to advertise the program, this is to spread around your community, to generate interest in booking the program.

**Prevention Materials Coming Soon**

Email [info@palyme.org](mailto:info@palyme.org) to inquire and order these brochures coming soon.

Dare to Prevent – in detail prevention information covered in the workshop

Dare to Prevent – Yards

Dare to Prevent – Pets

Dare to Act – what to do if bitten by a tick, including how to properly remove a tick

**Website widget: put Dare 2B Tick Aware on YOUR website!** Dare 2B Tick Aware widgets are available on the Dare 2B Tick Aware page. You can add a widget to your website, you can have your township, county, community groups – add this widget. When visitors click on the widget on their sites, it will bring them to the Dare 2B Tick Aware program page, where they can read about the program and sign up for a free tick seminar. Go to <http://palyme.org/dare-2B-tick-aware.html> to access the widget to place on your site. It's as easy as 1, 2, 3!

**For more information:** email Amy Tiehel, Dare 2B Tick Aware Program Manager, at [info@palyme.org](mailto:info@palyme.org).



*PVCA would like to Thank the  
Lily Bennett Foundation  
for Sponsoring the Program "Surveillance  
for Tick Borne Pathogens in the Lehigh  
Valley of Pennsylvania"*

**My name is Lily.  
I am forever three.**

For more information on supporting  
the foundation, please visit:  
[www.lilybennettfoundation.org](http://www.lilybennettfoundation.org)

Raising awareness of Rocky Mountain Spotted Fever  
and other tick borne diseases.

## Pesticide Recertification Credits for Attending the Annual PVCA Conference

November 7, 2017 Sessions 1 & 2	November 8, 2017 Sessions 3 - 6	November 9, 2017 Session 7 & 8																																
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Pennsylvania Department of Agriculture Meeting ID numbers will only be provided to those attending sessions.

Space reserved for vendors: 1/8 page free to sustaining members, otherwise 1/8 page \$50, 1/4 page \$75, 1/2 page \$100 and full page \$200. Contact Andy Kyle for more information regarding advertising in our newsletter.

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## Calendar of Events

November 12 - 15, 2017: Florida Mosquito Control Association Conference, Duck Key, FL

November 13 - 14, 2017: Pennsylvania Pest Management Association Annual State Conference, Lancaster, PA

December 4, 2017: Penn State Extension Professional Pest Managers School, Grantville, PA

December 4 - 6, 2017: Northeastern Mosquito Control Association Conference, Plymouth, MA

January 6 - 13, 2018: 102nd Pennsylvania Farm Show, Harrisburg, PA

February 12 - 14, 2018: Mid-Atlantic Mosquito Control Association 43rd Annual Meeting, Carolina Beach, NC

February 26 - March 2, 2018: American Mosquito Control Association 84th Annual Meeting, Kansas City, MO



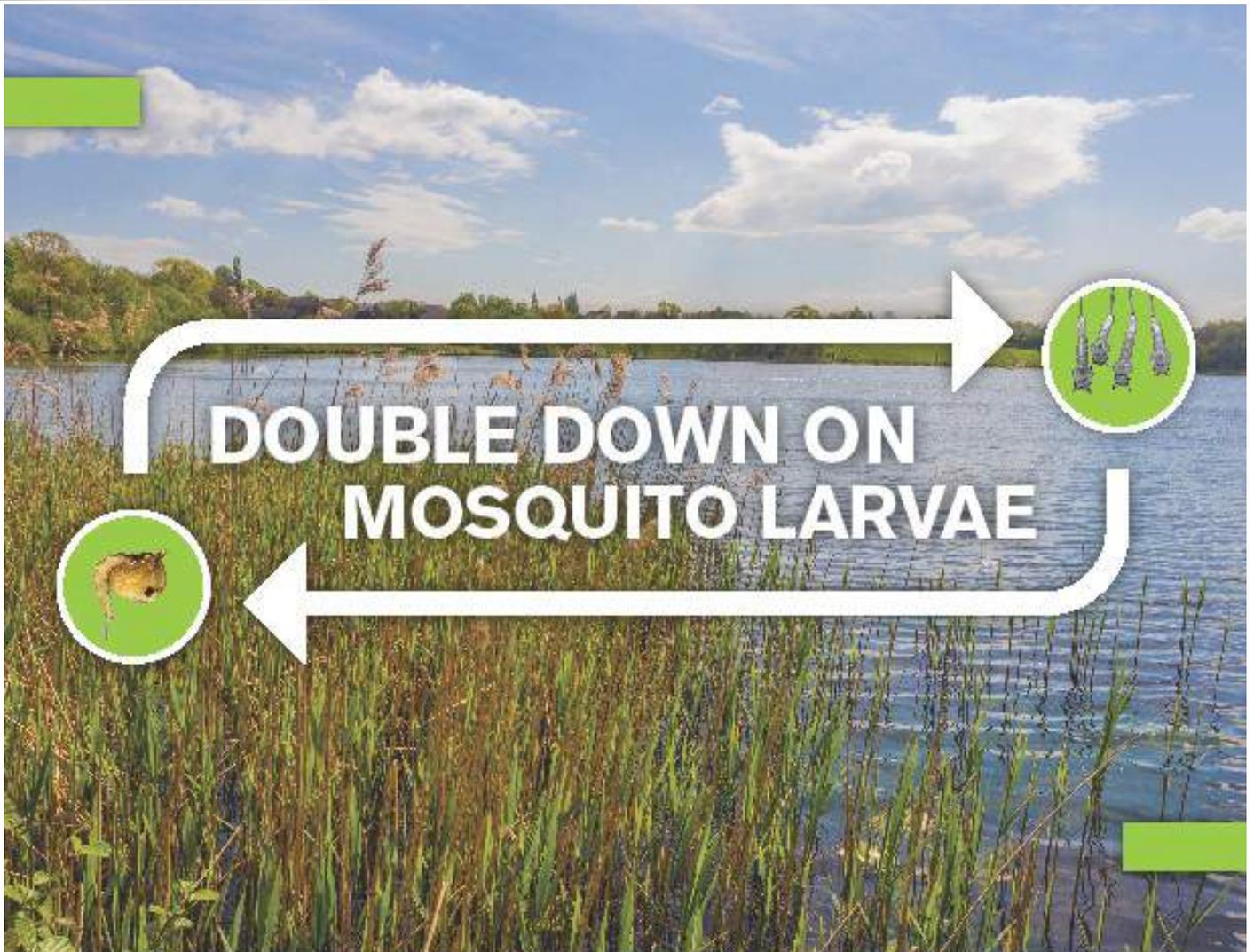
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[www.pavectorcontrol.org](http://www.pavectorcontrol.org)

The Pennsylvania Vector is an informational news letter, written and produced for the purpose of providing the members of the PVCA with updates on activities conducted by this group and to highlight innovations made in the field of vector control. Articles herein have been reviewed for content and to the best of my knowledge contain the most current information available. The Pennsylvania Vector will be mailed to organization members, with past editions available in PDF format on the PVCA web site at [www.pavectorcontrol.org](http://www.pavectorcontrol.org).

Items posted in "The Pennsylvania Vector" are submitted by the general membership and staff. Posting herein allows for the widest dissemination to all members of the organization. Should a listed event be cancelled or rescheduled (after publication), revisions will not be printed or mailed to the membership as part of the News Letter process. These revisions should be submitted as soon as possible by email or fax to the PVCA web site.

Organizations are encouraged to submit News Letter articles and can do so by contacting this office. Cut-off dates : Feb 15th, Jun 15th, and Oct 15th. Publications will be issued March, July, and November.

**PVCA members, have you considered attending the American Mosquito Control Association's Annual Washington Conference?**

Each year in May, members from mosquito control associations across the country attend this conference and take time to meet with their Congressional Representatives. As long as you are a current member of AMCA you may attend. A limited number of stipends sponsored by Central Life Sciences are available to first time attendees. PVCA will also provide a stipend for a member to attend. If you are interested or would like to learn more please contact Leah Lamonte or Tom Smith. Many of our members have participated in the past. AMCA will provide details about the next conference by March 2018.

You can find more information at: [www.mosquito.org/page/washington](http://www.mosquito.org/page/washington)



**PRESIDENT'S Corner**

**Leah Lamonte**



I want to thank all PVCA members for the opportunity to serve you as President for the past two years. It was my pleasure to help the organization with planning conferences, making decisions, and working with the PVCA board members who tirelessly serve as well. I extend my congratulations to President Elect, Tom Smith, as he becomes our new President at the end of the upcoming conference, November 7-9, 2017. Take it away, Tom!

Leah Lamonte

**EDITOR'S Corner**

**Tom Smith**



It's hard to believe that I have been the editor of the PA Vector Newsletter for five years! The time has come for me to start a new page as President of PVCA. I want to thank everyone for assistance with the newsletter and look forward to my new role with your continued support.

Thank you,  
 Tom Smith