

The Environmental Synopsis

A Monthly Update from the Joint Legislative Air and Water Pollution Control and Conservation Committee

FEBRUARY 2016



The Chairman's Corner

**Senator Scott E. Hutchinson,
Chairman**

This year marks an important milestone for many of our nation's most valued bird

species. It is the centennial anniversary of the Migratory Bird Treaty, an international success story that has safeguarded the population of countless birds over the last 100 years, and has even been credited with saving several species from the brink of extinction.

The Migratory Bird Treaty was the result of a convention between the United States, Canada and Great Britain in 1916. Despite being in the midst of World War I, the countries were looking for a way to collectively protect and manage bird species that migrate across international borders, rather than relying on a patchwork of individual laws and regulations. The treaty and the accompanying Migratory Bird Treaty Act of 1918 proved so successful that three additional treaties were signed shortly thereafter between the U.S., Japan, Russia and Mexico.

According to the U.S. Fish and Wildlife Service, "The MBTA provides that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a per-

mit issued by the Secretary of the Interior." Since its enactment, the MBTA has grown to encompass over 800 different species, from hummingbirds, to swallows, to eagles and geese. The regulations prompted states to pass their own laws governing migratory birds and establish specific hunting seasons for game birds covered under the act.

There have been many success stories over the course of the treaty's 100-year history, but perhaps the most well-known example is that of the snowy egret. Before passage of the MBTA, the feathers of the small white heron were in great demand, widely used as a decoration for women's hats. Plumage hunting pushed the snow egret population to



dangerously low levels, almost to the point of extinction. With the MBTA in place, the snow egret population gradually rebounded and is now considered a species of least concern by most conservationists.

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Notes from the Director

Tony M. Guerrieri, Executive Director

When you think about the properties of a good mattress, what comes to mind? Probably comfort, durability and support. But would you expect your mattress to be fire-proof?

In 2007, the Consumer Product Safety Commission began to require that all mattresses sold in the United States be able to withstand 30 minutes of exposure to an open flame. As many of the substances used to make regular mattresses are not naturally flame retardant, this means that manufacturers must add chemicals to be able to satisfy the federal flame retardant requirements.

At one time, manufacturers were treating mattresses with toxic flame-retardant chemicals like polybrominated diphenyl ether, better known as PBDE. According to the International Sleep Products Association (the international trade association representing the mattress industry), mattress manufacturers no longer use PBDEs, and are instead using more plant-based materials to make mattresses.

Since we spend up to 30 percent of our lives sleeping, it makes sense to buy a mattress that won't make you sick. The average conventional mattress often contains a significant number of other toxic chemicals. In one test, a mattress was found to emit a number of chemicals and synthetics, including the carcinogens benzene and naphthalene. Most mattresses also contain:

- Polyurethane foam, a petroleum-based material that emits VOCs that can cause respiratory problems and skin irritation.
- Formaldehyde, which is used to make one of the adhesives that hold mattresses together, has been linked to asthma, allergies and lung, nose and throat cancers.

With these realities in mind, an increasing number of people are turning to eco-

friendly mattresses made of natural materials – known as organic or natural mattresses. Not all organic or natural mattresses are created equal, however, and some can have the same issues as conventional mattresses. If you decide to purchase an organic mattress, it will likely be made of these natural materials:

- Organic, chemical-free wool – Wool is naturally flame retardant and also resistant to mold and bacteria. It is often used as a cloth diaper cover because of its ability to repel water and moisture.
- Organic, chemical-free cotton.
- Organic, chemical-free latex. Organic latex gives firmness and support to the mattress without the need for springs or metal. Natural latex is also resistant to mold and dust mites and great for temperature regulation.

Conventional mattresses often contain a significant number of toxic chemicals, which has spurred a growing market for chemical-free “organic mattresses.”

So how can you be sure your mattress is truly natural or organic? There's a strict set of standards for organic foods, but the rules are looser for other products. Figuring out whether mattresses are partially or completely chemical-free can be a



challenge because there are so many different labels making various claims.

Take the term “natural” on a mattress for instance. It's essentially meaningless, with no standards behind it and no required verification. Even a mattress labeled “organic” may have only some materials that are actually certified organic by the U.S. Department of Agriculture. For a mattress to be truly organic, it should have at least 95 percent certified organic materials. It should also prohibit potentially harmful chemicals used in processing.

If you're in the market for a mattress made without potentially harmful chemicals, here's what you need to know about the labels you'll see and their claims. According to an article in Consumer Reports, only two mattress labels precisely meet the most stringent qualifications: the Global Organic Standard (GOTS) and, for mattresses that contain latex, the Global Organic Latex Standard (GOLS).

GOTS requires that at least 95 percent of the materials in the mattress be certified organic, and it prohibits outright the use of certain substances even for the other 5 percent, such as chemical flame retardants and polyurethane. GOLS ensures that a mattress with latex is made of organic latex, with restrictions on the other 5 percent of the mattress's components. Natural-latex mattresses may have both the GOTS and GOLS labels.

Prices for mattresses with green claims run from as little as \$600 to more than \$25,000 for luxury versions. In general, expect to pay around \$4,000 for a king-size mattress – more for one meeting GOTS or GOLS standards.

Regardless of which mattress you buy, Consumer Reports recommends airing it out for at least 48 hours before using it to reduce your exposure to harmful chemicals.

Research Briefs

Each month, the committee's staff researches and prepares a number of "briefs" on several topics relevant to the committee's mission. Very often these briefs include references to reports and further research on the topics so that readers may pursue issues on their own. Please note that the information and opinions expressed in the Research Brief articles do not necessarily represent the opinions or positions of the Joint Legislative Air and Water Pollution Control and Conservation Committee, nor those of the Pennsylvania General Assembly.

Cycling Can Reduce Transportation CO2 by Ten Percent

Tony M. Guerrieri
Executive Director

The U.S. transportation sector is a source of substantial and rapidly-increasing greenhouse gas emissions. But what is the potential of cycling when it comes to lowering greenhouse gas emissions? Pretty significant, according to a joint report by UC Davis and the Institute for Transportation and Development Policy. The report, A Global High Shift Cycling Scenario, attempts to measure the potential of biking to reduce greenhouse gas emissions.

According to the report, about 1 percent of all urban trips are made by bike in the United States. It is a tiny fraction, especially when compared to stand-out cycling countries such as the Netherlands (where cycling exceeds over 27 percent of all trips), Denmark (26 percent), China (17 percent) and Japan (19 percent).

The report concludes that if urban transportation trips by bicycle and electric biking (defined as two-wheeled vehicles equipped with a bicycle drivetrain but enhanced with an electric motor) are increased from estimated worldwide average of 6 percent currently to 10 percent by 2030 and 14 percent by 2050, transportation carbon dioxide (CO2) emissions will be cut by nearly 11 percent compared to a scenario where efforts to promote sustainable transportation sidestep bicycling.

Savings of around \$24 trillion could be achieved through eliminating the need for new major highways, parking facilities and the maintenance of existing infrastructure to accommodate forecast growth in road traffic.

To reach those numbers, bicycling would rise to about 11 percent of miles traveled in American and Canadian cities by 2050. In countries like China where the rate is already above that level, it would be as high as 25 percent.

If trips by bicycle and e-bikes increase to 14 percent of all urban trips by 2050, transportation-generated CO2 could be reduced by nearly 11 percent over the baseline scenario.

The idea is that cities could help meet national targets through a mix of safety and transit policy initiatives and major infrastructure buildouts. The report fo-

cuses on urban areas, where higher density helps planners create realistic mobility alternatives to cars.

Not every city is destined to be Amsterdam (where cycling exceeds over 40 percent of all trips), but more than half of all urban trips worldwide (at least in countries and cities where data is available) are less than 10 kilometers, or a little over six miles, meaning they are within reasonable cycling range.

Even in the United States, more than 35 percent of trips are less than 5 kilometers (just over three miles), a distance typically covered in twenty minutes or less by bike. A number of such trips should be feasible for many, or at least amenable to travel via e-bikes.

According to the report, what makes a route feasible is not only about distance - it is also about street design, bike lanes, and an individual's sense of safety and comfort level with riding. The report recommends some of the following actions by government:

- Rapidly develop cycling and e-bike infrastructure on a large scale;
- Implement bike share programs in large- and medium-size cities, prioritizing connections to transit;
- Invest in walking facilities and public transport to create a menu of non-motorized transport options that can be combined to accommodate a wide variety of trips;



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- Repeal policies that subsidize additional motor vehicle use, such as minimum parking requirements, free-on-street parking and fuel subsidies;
- Adopt policies such as congestion pricing, vehicle kilometers traveled fees, and development impact fees to charge a price for driving that accounts for negative externalities; and
- Dedicate fuel taxes, driving fees and other transport-system revenues toward investment in sustainable transport.

E-bike growth is factored into the conclusions, with many mainland European countries, China and Japan posting impressive sales growth, particularly in the past five years. Sales figures and trends show that outside of the Asia Pacific, in particular, the opportunity for the market to grow is substantial.

The report, A Global High Shift Cycling Scenario, is available at:

https://www.itdp.org/wp-content/uploads/2015/11/A-Global-High-Shift-Cycling-Scenario_-Nov-2015.pdf.



The State of Carbon Capture Technology

Coleen P. Engvall
Research Analyst

Efforts to provide a cleaner environment have largely focused on energy and efficiency in both the private and public sectors. Governments have emphasized the research and development of renewable

power sources, and companies have invested in these technologies. But energy production is only one slice of the pie. In the United States, sectors such as construction, manufacturing and agriculture all contribute significantly to pollution and carbon emissions. Additionally, there are still many fossil fuel-reliant power plants that are currently functioning.

So what more can be done to improve air quality, public health and emissions? Some have argued that replacing all fossil fuels with renewables will take too much time, or will be too costly. Instead, some scientists have focused their efforts to explore technologies that make our current energy mix cleaner. One such technology is carbon capture and storage (CCS).

The researchers at the IEA believe that carbon capture and storage technology could help achieve deep cuts in carbon emissions within the coming decades.

The International Energy Agency released a report entitled Carbon Capture and Storage: The Solution for Deep Emissions Reductions. They argue that employing carbon capture and storage (CCS) technology should be considered in order to meet greenhouse gas targets.

The report outlines why they believe CCS should be more widely utilized. First, they point out that fossil fuels still dominate the globe for power production. Instead of replacing all of these facilities with renewable alternatives, the report argues for retrofitting existing plants and including CCS in the blueprints for new plants. This allows investors to continue to benefit from the approximately 30 year life span of these plant without sacrificing the goal of cutting emissions.

This is especially important given the relatively short timeframes that have been set by governments for climate goals. Additionally, in developing countries such as China and India, plans for several coal-fired power plants are moving forward. Carbon capture could prospectively allow these nascent economies to continue on their current trajectory without sacrificing greenhouse gas target reductions.

There are currently fifteen large-scale CCS operations in existence, modifying natural gas processing facilities, coal-fired power plants and other carbon-intensive industries. While the report acknowledges that several more CCS projects are currently in the works, they state that increasing the scope and number is key to realizing the full potential of the technology, as well as the full cost savings. Addressing the ever-present concern of financing, they emphasize that as CCS is gathering institutional knowledge with these first 15 projects, operators already foresee cost reductions of up to 30 percent for future projects.

While the development and installation of CCS seems daunting, the report outlines how CCS could actually improve fossil fuel energy's odds of competing with other energy sources in the coming years. Sources such as coal and diesel have declined in profitability due to factors such as public demand, as well as increased government regulation. Some market analysts have signaled that coal's heyday has come and gone. However, given the success at the first coal-fired power plant with CCS in Canada, the report presents figures suggesting that coal could become as competitive as natural gas. These predictions are based off of the assumption that carbon regulations will only become more rigorous and that CCS will continue to fall in price.

Again acknowledging the tight time-frame that many governments and companies are pursuing for cleaner energy, the report states that CCS should be in-

cluded in their low-carbon strategies. To use this asset to its fullest, the report calls on governments to include CCS into their climate mitigation strategies and on industry to invest in research, development and demonstration.

To read the full report, go to: <http://www.iea.org/publications/freepublications/publication/CarbonCaptureandStorageTheSolutionfordeepemissionsreductions.pdf>.

Pennsylvania Well-Prepared for Changes in Extreme Weather

Tony M. Guerrieri
Executive Director

Most U.S. states are prepared to deal with significant and increasing risks posed by changing levels of extreme weather, according to a report from non-partisan research and reporting group Climate Central and the consulting firm ICF International.

The report, *States at Risk: America's Preparedness Report Card*, assesses how well the 50 states are gearing up for the impact of climate change. It is designed to help provide a benchmark for states to determine risks as well as build and implement action plans to increase their preparedness levels.

To identify the states most vulnerable to the five critical areas of risk – extreme heat, drought, wildfires, inland flooding and coastal flooding – the report assesses each state's risks by studying the latest climate and hydrology projections through 2050, as well as localized sea level rise projections.

Then, in states that were found to have statistically significant increasing threats to people and infrastructure in the coming five decades, the report examined four categories of actions: reducing current risks, assessing vulnerability to future risks, planning for future risks

and implementing actions to reduce future risks. The grades were assigned relative to other states, and relative to the magnitude of the risks themselves.



Four states received A's in the report; five received F's. California, Massachusetts and New York, along with Pennsylvania, each earned an overall "A" grade for how well they've addressed their respective vulnerabilities. Connecticut scored an "A-." Arkansas, Texas, Nevada, Mississippi and Missouri all flunked, earning an "F" on the report card. The rest of the states were divided fairly evenly among the ranks of B's, C's and D's.

Pennsylvania recently received an "A" grade from ICF International for how well the state has addressed vulnerabilities to changing levels of extreme weather.

Texas, California and Florida (which earned a "C-") face the greatest threats from climate change overall, the report found. Florida ranked first in the nation for both inland and coastal flooding threats, and second in terms of extreme heat. California ranked second in wildfires and inland flooding, and third in extreme heat. Texas secured the top spot for highest risk of extreme heat, drought and wildfires.

Yet other states may eventually surpass Texas for drought risks as climate change alters rain patterns in the West and Midwest. By 2050, nine states – Colorado,

Idaho, Michigan, Minnesota, Montana, New Mexico, Texas, Washington and Wisconsin – are projected to have even greater drought problems than Texas faces today, according to the report.

How prepared is Pennsylvania for climate change? The report found that Pennsylvania is well ahead of other states in preparing for climate threats. Pennsylvania received a B+ for preparing for extreme heat; an A for drought readiness; and a B+ on inland flooding. Risk areas that were not relevant to a state were not included in its grade; Pennsylvania was not graded on wildfire risk.

The report highlights Pennsylvania's Climate Adaptation Planning Report that covers drought, and integrated climate change and drought concerns into its state water plan. Even so, the Keystone State is far from climate-proof. The report notes that there is no evidence of official state funding or policies to improve resilience against climate change-related extreme heat, inland flooding, drought, or coastal flooding.

Key findings related to the risks Pennsylvania faces from extreme weather include:

- By 2050, the typical number of heat wave days in Pennsylvania is projected to increase more than five-fold from 10 to approximately 55 days each year.
- More than 430,000 Pennsylvanians live in flood-prone areas. This ranks in the top five states among the 32 assessed for inland flooding threat.
- By 2050, the severity of widespread summer drought is projected to see a below average increase of almost 50 percent, and its threat level is projected to drop to below average.

The full national report, *States at Risk: America's Preparedness Report Card*, and a nine-page summary for each state (including Pennsylvania) is available at the States at Risk website: <http://state-atrisk.org/>.

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Waterborne Illness from Private Wells

Coleen P. Engvall
Research Analyst

Safe drinking water is something most Americans take for granted. Waterborne illness is seen to be more of a problem in developing countries, but not in wealthier nations like the United States. However, this perception is linked to drinking water that is processed in treatment facilities, then delivered to homes and businesses through pipelines. This system is tightly regulated by both the state and federal government, and water treatment facility operators are required to report on the levels of chemicals and contaminants regularly. But not every American gets their drinking water from a bottle or a tap.

In fact, three million people in Pennsylvania alone receive their drinking water from private water wells. While these wells have certain advantages, particularly for people living in more remote areas, there are some concerns about the water's susceptibility to bacteria and contamination.

Researchers from Temple University raised questions about the potential for waterborne illnesses to be contracted from well water. Their study examined

cases of acute gastrointestinal illness (AGI) reported in Canada, looking for ties to where those affected were receiving their water. The researchers published their findings in a report entitled *Estimating the Burden of Acute Gastrointestinal Illness due to Giardia, Cryptosporidium, Campylobacter, E. Coli O157 and Norovirus Associated with Private Wells and Small Water Systems in Canada*.

The researchers found a few patterns in how water source and type affected the transmission of waterborne illness. It is important to note that people drinking surface water have a higher incidence of AGI than those drinking well water. However, the number of people who drink untreated surface water is relatively small.

Researchers from Temple University conducted a study to estimate how many cases of acute gastrointestinal illness can be attributed to untreated surface and ground water.

Of the five causes of AGI they looked for, noroviruses were responsible for almost three-quarters of the cases seen from well water. The norovirus, which is commonly known as food poisoning or stomach flu, is a virus that specifically attacks the stomach and large intestine and is a common cause of AGI. In the United States, 1.5 percent of norovirus outbreaks were attributed to drinking water. Considering the number of stomach flu cases, even when accounting for underreporting, this is a significant number of illnesses and associated costs across the country. For comparison, untreated water is a well-known source of E. coli O157 outbreaks, however, it is overall less common than the norovirus.

The study uses an assessment approach to estimate the number of AGI

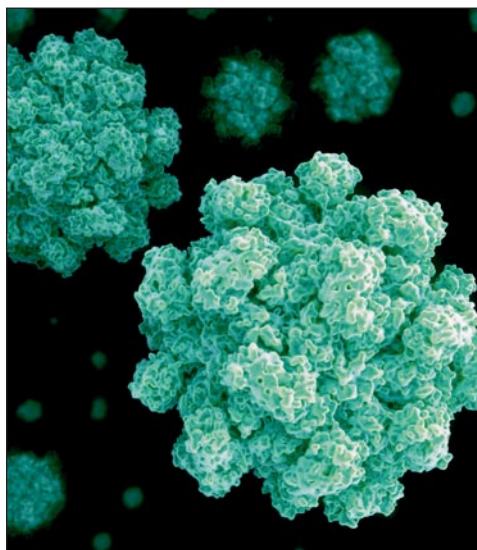
cases caused by private well water. The approach takes into account that cases of AGI are underreported to reach its final conclusions. According to Heather Murphy, one of the authors, if the approach is applied to Pennsylvania, there could be as many as 81,000 cases annually. As of yet, a direct study on the safety of private wells in Pennsylvania has not been conducted.

The report also points out that the study faces limitations in terms of how the data was gathered and what data they focused on. Source data about regional water pathogens is key to understanding the issue, as well as how populations react to different doses of these pathogens. Additionally, waterborne pathogens can effect populations in other ways. Infected water used for recreation, agriculture and medical applications could be a subject of future study.

While the report does not include any specific recommendations for regulators, they stress the importance of evaluating how much of an impact waterborne illness from well water has on public health. They hope that a greater understanding of this issue will drive more study as well as methods to mitigate it. In the meantime, the authors urge governments to promote education for private well owners on the risks as well as what effective testing and treatment options they can pursue. Current technology that can be deployed on a small scale include U.V. light treatment, chemical disinfectants and filtration.

For the many Pennsylvanians getting their drinking water from private wells, education about how to test their water regularly and apply the appropriate treatments can go a long way in avoiding AGI and other health hazards.

To read the full report, go to: <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=10034786&fileId=S0950268815002071>.



On the Horizon *A Look at Upcoming Events*

Monday, March 14, 2015, 12 noon *Environmental Issues Forum*

Room 8E-A, Capitol East Wing, Capitol Complex, Harrisburg, PA

The guest for our March forum will be HeritagePA, the state association of Pennsylvania's Heritage Areas. Heritage Areas are designated geographic regions of the Commonwealth that have a unifying cultural or historical theme. A recent study conducted by the Center for Rural Pennsylvania found that Heritage Areas contribute nearly \$2 billion annually to the state's economy. A representative from HeritagePA will provide an overview of the program, the benefit they provide to the community, as well as future opportunities and challenges.

Please call the committee office at 717-787-7570 if you plan to attend the Environmental Issues Forums. And be sure to check the committee website at <http://jcc.legis.state.pa.us> for more details and events as they are added to the schedule.

Check Us Out on Social Media!

You can now receive updates on committee events, new research and more by following the Joint Legislative Conservation Committee on social media. You can find us on Facebook at www.facebook.com/jointconservationcommittee, or on Twitter at www.twitter.com/PA_JLCC. Take a moment and follow us today for the latest on issues related to Pennsylvania's diverse natural resources!

Committee Chronicles *A review of memorable committee events*

In January, the Committee was pleased to welcome our second legislative intern, Michael McKelvey, from Temple University. Michael is a junior political science and environmental studies major from Hanover, York County, and is participating in Temple's Pennsylvania Capital Semester program. The program places interns in legislative offices, state agencies, and non-profits to explore government affairs, policymaking and program implementation on a first-hand basis. Two nights a week, the interns also take courses on public policy and state politics at Temple's Harrisburg satellite campus.

Michael attributes his interest in the environment to his parents, who taught him at an early age to cherish the great outdoors. During the spring semester, Michael will help write articles for the Environmental Synopsis, assist with planning hearings and events, and monitor legislative activity. "I am looking forward to learning more about state environmental policy here at the JLCC," Michael said. "I hope to use my time on the committee to broaden my perspective on some of the most important issues affecting Pennsylvania's diverse natural resources."

Outside of his internship, Michael enjoys biking, fishing, hunting, and backpacking. He plans to attend law school following graduation.





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The Chairman's Corner

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Interestingly, I came across an article that examined the MBTA's indirect effect on one of Pennsylvania's most prized game birds: the wild turkey. As covered in the November edition of the Environmental Synopsis, the wild turkey was also pushed to the brink of extinction by hunting and human pressures in the early 20th century. While not considered a migratory bird, the wild turkey greatly benefited from the protections of the MBTA and the habitat restoration work conducted to support migratory species. Today, due to targeted conservation efforts, the wild turkey population is expanding across the nation and continues to be a popular game species for Pennsylvania hunters.

The Migratory Bird Treaty has protected countless migratory birds throughout its 100-year history, many of which are integral to our environment, agriculture and economy.

The importance of the MBTA goes beyond maintaining rich biodiversity. Protecting and managing migratory bird species has a lasting impact on our environment and economy. Pollination, insect and rodent control, and seed dispersal are all important benefits provided by migratory birds. They also help support our economy, with wildlife watchers spending nearly \$60 billion annually on recreational activities, according to the USFWS. These contributions only further demonstrate the significance of this year's historic milestone.

The USFWS, National Audubon Society, Ducks Unlimited and a host of other bird conservation groups are partnering on a

centennial campaign for 2016 in order to highlight the successes of the MBTA and to raise awareness about the importance of migratory birds. The USFWS plans to use social media and volunteer opportunities, such as citizen science programs and bird counts, to increase support for agency initiatives. They also hope to increase sales of the Federal Duck Stamp, from which proceeds are used to fund habitat restoration for migratory species.

If you are interested in participating in the centennial campaign, you can find more information by visiting the USFWS's website at www.fws.gov.

Despite the remarkable accomplishments the MBTA has been able to achieve over the last century, the USFWS and its partners remind the public that challenges still remain in protecting and managing our nation's migratory bird population. As old pressures, such as plumage hunting, have faded into the background, new difficulties have emerged that can potentially threaten their survival.

One of the most serious threats is the alarming number of avian deaths associated with wind turbines. According to the most recent data, the USFWS estimates that 440,000 birds were killed by wind turbines in the U.S. in 2009, and another 573,000 birds were killed in 2012. The agency forecasts that avian deaths from wind energy operations may exceed one million by 2030. The USFWS considers this a focal point in the ongoing effort to protect migratory birds.

As we enter into 2016, and hopefully an early spring, take some time to learn more about the migratory bird species that frequent your region. From large raptors to small hummingbirds, it's likely that many of the birds you will encounter on a daily basis have benefited from protections of the MBTA, and in turn are helping us maintain a healthy ecosystem here in Pennsylvania.



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