



The Environmental Synopsis

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

NOVEMBER 2015



The Chairman's Corner

**Senator Scott E. Hutchinson,
Chairman**

Anglers looking to hook monster-sized trout here in Pennsylvania will soon get a little

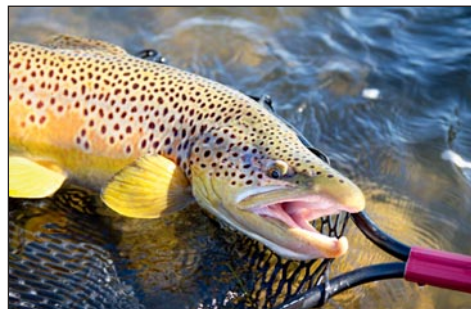
help from the Pennsylvania Fish and Boat Commission. Under the commission's new Keystone Select Stocked Trout Waters program, sections of some of the best trout streams in our state will be specially stocked to assist anglers in landing trophy trout, some up to 20 inches long.

The new program was unveiled in September but had been in the concept stage for several months. After the program was presented at a meeting earlier this year, the commission opened an online promotion asking for recommendations on the name of the new program. A committee reviewed over 1,500 submissions and selected the new title, which corresponds with the agency's re-branded statewide stocking program.

The goal of the Keystone Select Stocked Trout Waters program is simple: help Pennsylvania's trout fisherman land bigger fish. To accomplish this goal, the commission looked to a local program on Pine Creek, Lycoming County, as a model. By intentionally stocking larger trout in certain sections of the already-popular stream, business owners and sportsmen's groups found even more an-

glers were traveling to their community to hook trophy trout. The increased tourism brought more money into the local economy as the visiting fishermen purchased gas, food, lodging and tackle from nearby businesses during their stay.

After witnessing the success of the innovative Pike Creek program, Executive Director John Arway and his staff de-



ecided to take the stocking model statewide. Under the new program, 3,200 large trout will be stocked in sections of eight streams throughout the commonwealth. These brook, brown and rainbow trout measure anywhere between 14 and 20 inches and are stocked at a rate of roughly 250 fish per mile. This closely mirrors the population of large trout in Pennsylvania's most productive wild trout streams.

The Fish and Boat Commission's 'Keystone Select Stocked Trout Waters' program is the perfect way to target trophy-sized trout while helping fuel the local economy

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Notes from the Director

Tony M. Guerrieri, Executive Director

It's now considered a myth that Benjamin Franklin advocated the turkey as the official symbol of the United States over the bald eagle, though he did write that the turkey is "a much more respectable bird, and a true original native of America." The Franklin story is too irresistible to not tell around this time of year, though the subject here is the wild turkey, a distant relative of the farm-raised supermarket birds that will land on the tables of millions of Americans this Thanksgiving.

What few people realize is that the nation's wild turkey population once teetered on the brink of extinction. How that fate was avoided represents what is considered by some experts to be the greatest wildlife conservation success story of the last century.



The largest ground-nesting birds on the continent, turkeys roamed in the millions across what are now 39 states, Canada and Mexico before Europeans arrived. The birds, found only in North America, were so common, in fact, that settlers who hunted them thought they'd never run out. It was always open season on turkeys, and there were no bag limits.

As the country grew and the population expanded westward, the iconic American birds began to disappear at an astonishing rate. Hunting pressure made them rare in parts of Massachusetts by 1672 and gone completely from the state by 1851. By the Civil War, they were extinct in New England. By the early 1900s,

when eastern forests – including Pennsylvania – had been lumbered, the turkey was nearly gone, roughly 30,000 wild turkeys remained. The treeless landscapes were terrible habitat for the tree-roosting native turkey.

Once pushed to the brink of extinction, the wild turkey is now found in all 67 counties of Pennsylvania, with a total population of more than 280,000 birds

Wild turkeys had disappeared from 18 of the 39 states where they had once thrived. Where they were abundant, now they were gone. The few viable populations left were found in Alabama, Georgia, Florida and South Carolina. In the field of wildlife biology at the time, there was a lot of concern that they could go extinct.

In an effort to revive populations, wildlife biologists hatched wild turkey eggs, raised hatched birds in pens, and put them into the wild. Most died, lacking survival skills. However, by the 1950s, Pennsylvania's forests began to mature and turkeys began to expand their range. Unfortunately, the wild turkeys that remained were so few and fragmented that their resurgence was still unlikely.

The only solution that seemed to work was trapping wild turkeys and transferring them where they no longer existed. Capturing the elusive birds to relocate them to new areas was far easier said than done. Catching wild turkeys is very difficult – they can fly 55 miles an hour and run faster than deer for short distances.

In the 1950s, a technological breakthrough – the net cannon – was instrumental in saving wild turkeys in America. Suddenly, biologists had a tool with

which to capture mature turkeys for release. A large net was concealed on the ground. Turkeys were baited to the area. The net was then remotely propelled over the turkeys with small rockets.

What came next was a giant catch-and-relocate effort by state wildlife agencies at the behest of hunters, who paid a federal excise tax on guns and ammunition to fund game-restoration programs. By 1973, when the National Wild Turkey Federation (NWTf) was founded to promote turkey hunting, the states had built the wild-bird population up to an estimated 1.3 million birds. Conservationists called it one of the greatest species comebacks of the 20th century. And it was just beginning.

By 1990, the population was up to 3.5 million and by 2000 that number was 5.4 million. A little over a half century after nearing extinction, there are now more than 7 million wild turkeys in America.

Today, turkeys are now found in every county in Pennsylvania, over 280,000 strong. While the statewide turkey population has experienced moderate declines in recent years, Pennsylvania hunters for nearly 20 years have consistently harvested more than 30,000 turkeys in the spring season.

Turkey hunting pumps billions of dollars into the economy each year. Turkey hunters spend more than \$4 billion a year on permits, shotguns, ammunition, calls, camouflage clothing and other equipment, according to the NWTf.

This Thanksgiving, as you sit around the dinner table with family and friends, pay brief homage to this savory bird before beginning your carving. Whether you enjoy a store bought bird or a wild turkey harvested by a lucky hunter, you will be partaking of what Benjamin Franklin called "a true original native of America."

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.

The Top 10 Foreign Countries for LEED

Tony M. Guerrieri
Executive Director

Leadership in Energy and Environmental Design (LEED) is a system guiding the design, construction, operations and maintenance of green buildings. To date, project teams in more than 150 countries and territories have implemented LEED in their building projects. According to the U.S. Green Building Council's (USGBC) annual ranking of top countries for LEED-certified buildings, Canada was rated the top country outside the United States for having the most certified and registered projects.

The Top 10 list highlights other countries that are making significant strides in sustainable building design and construction. It provides a snapshot of the green building movement in international markets. Though LEED is not the world's only green building rating system, it is the most widely used and recognized.

The analysis used to develop the list ranks countries in terms of cumulative gross square meters (GSM) space certified to LEED in each nation and numbers of projects to date. In order for a project to be LEED certified, it must meet strict limitations on energy and water usage and carbon emissions. The U.S. is not included in this list, but remains the world's largest market for green building, with 276.90 million GSM of LEED-certified space, 727.34 million GSM of LEED-certified and registered space, and 53,908 LEED-certified and registered projects.

Canada tops the list with 26.6 million GSM (almost 28 billion square feet) LEED-certified space. Collectively, Canada has 4,814 LEED-registered and certified projects representing 63.3 million GSM of space.

China and India, two of the world's fastest growing economies, are also rapidly adopting the use of LEED sustainable building practices, trailing only the U.S. and Canada

China and India, two of the world's fastest growing economies and rapid adopters of green building practices, took second and third place on the list, respectively. China was second in the ranking with 2,022 projects. However in terms of square meters, the country far surpasses Canada, with 118.34 million GSM.

India ranked third, with a total of 73.51 million GSM of LEED certified and registered space. It has 1,883 LEED projects.

The rest of the list includes, in descending order, Brazil, South Korea, Germany, Taiwan, United Arab Emirates, Turkey and Sweden.

These 10 countries are geographically and culturally diverse, representing seven of the world's 20 largest single-nation economies by gross domestic product (China, Germany, Brazil, India, Canada, South Korea and Turkey), as well as six of the top 11 emitters of greenhouse gases (China, India, Germany, South Korea, Canada and Brazil). Most notably, Brazil and South Korea have moved up in the rankings, while Turkey and Sweden are new to the Top 10 this year.

China, India and Brazil, three of the four BRIC economies, finished second through fourth on this year's list, respectively. According to the USGBC, these three countries currently represent more than 33 percent of global green-

house gas emissions, with China and India representing the largest source of projected growth in global emissions in the coming decades.

South Korea (4.81 GSM) and Taiwan (3.84 million GSM) join China in providing a strong East Asian contingent to the 2015 rankings.



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Germany (4.01 million GSM) and Sweden (2.54 million GSM) represent Europe on this list, with Germany finishing sixth and Sweden making the list for the first time in 10th place. Both nations are routinely cited for their innovation and leadership in international efforts to reduce greenhouse gas emissions.

Middle Eastern countries, United Arab Emirates (3.13 million GSM) and Turkey (2.95 million GSM) have both had strong green building years. The UAE increased its total amount of LEED-certified space by 72 percent over last year, and climbed from ninth place overall in 2014 to eighth overall in 2015. Turkey made the Top 10 list for the first time in the nation's history, finishing ninth overall.

Worldwide, the USGBC reports that there are 69,800 commercial and institutional projects, representing 1.23 billion GSM (about 13 billion square feet), participating in the LEED rating system. An additional 76,500 residential units worldwide have been certified under LEED for Homes.

For more information on the USGBC's annual ranking of top countries for LEED buildings, visit www.usgbc.org.

Batteries in the Grid: Expanding Beyond Storage

Coleen P. Engvall
Research Analyst

One of the major developmental hurdles in the implementation of many renewable technologies has been energy storage. If electricity is being generated locally by solar panels, there needs to be a way to keep the power flowing after the sun sets.

Batteries have been touted to the answer to this problem, but have yet been proven as a cost-effective alternative to traditional power sources.

However, as a report released by the Rocky Mountain Institute points out, the focus in developing batteries exclusively as a backup power technology has steered users away from other potentials. Batteries, they argue, can be used behind the meter, as well as at the distribution and transmission levels.

They outline their findings and recommendations in a report entitled *The Economics of Battery Energy Storage: How Multi-use, Customer-sited Batteries Deliver the Most Services and Value to Customers and the Grid*.

Underutilizing their potential means that half of a battery's life is spent idle. This means that the technology that we have today, which is seen as economically inviable, has the potential to be twice as efficient if used for more diverse applications.

Researchers from the Rocky Mountain Institute outline 13 diverse uses for battery technology to showcase opportunities for energy savings and efficiency that are currently being lost

So why are batteries being used in such a limited way? The authors argue that regulators, utility companies, researchers and battery developers all need to adjust their focus.

Regulators, researchers say, should not only remove the limitations on how batteries can be used for the grid, but they should require utilities to examine how best to use energy storage in conjunction with the other possibilities that they have laid out.

On the utility side, the researchers argue that new technology should not be pursued until companies evaluate what is possible with their current battery systems. If used for stacked applications, such as voltage support, black starts, as well as backup storage, utilities may find that there is no need to wait for more advanced systems before they can realize savings. The utility's planners, operators and designers should also be educated on how best to optimize their usage.

The report recommends that distributed energy resource developers should continue to make batteries more cost effective in order to reach more markets, as well as incorporating fully-utilized batteries into their own business models. They should also play a role in reaching out to utilities and regulators to plan for future capacities and technologies.



Researchers should focus their attention on modeling how these various uses of batteries can be optimized for the grid. This can help the aforementioned stakeholders to extract maximum savings and to regulate these uses effectively. The authors also call on researchers to map the various regulatory structures from state to state.

According to the study, combining the efforts of regulators, utilities and developers can see batteries being utilized much sooner and on a much larger scale.

To read *The Economics of Battery Energy Storage: How Multi-use, Customer-sited Batteries Deliver the Most Services and Value to Customers and the Grid* go to: <http://www.rmi.org/Content/Files/RMI-TheEconomicsOfBatteryEnergyStorage-FullReport-FINAL.pdf>



Pennsylvania's Alternative Energy Portfolio Standards have received national recognition for promoting clean energy, particularly in the form of solar power and industrial efficiency

Keystone State Emerges as Rising Clean Energy Leader

Tony M. Guerrieri
Executive Director

Leveraging its legacy in manufacturing and conventional energy production, Pennsylvania has developed a growing clean energy economy, according to a report by the Pew Charitable Trust.

The report, *Clean Economy Rising: Industrial Energy Efficiency Thrives in Pennsylvania*, states that over a five-year period (2009 to 2013), the Keystone State added nearly 1.4 gigawatts (GW) of clean energy capacity and attracted \$3.5 billion in private investment. New project installations over the next decade are expected to add 5 GW of capacity and generate \$17.7 billion in investment.

In 2004, Pennsylvania established its Alternative Energy Portfolio Standards mandating that 8 percent of the state's

electricity must come from Tier 1 renewable sources, which include solar, wind, hydropower, geothermal and biomass. Ten percent must come from Tier 2 alternative energy sources, which include advanced coal technologies, certain biomass projects and utility incentives for customers to reduce their energy consumption.

Because of this policy, solar power and industrial efficiency (212 megawatts and 3.3 GW, respectively, as of 2013) have grown rapidly in recent years.

Innovative financing mechanisms, property tax incentives, state grants and loans, and net metering, which allows customers to offset their energy costs by returning excess electricity to the grid, have further encouraged deployment of clean energy. These measures are complemented by federal incentives, such as the investment tax credit for solar and the production tax credit for wind.

Currently, wind energy accounts for the majority of the state's renewable capacity. Pennsylvania installed wind ca-

capacity is enough to power over 300,000 average homes. In 2013, Pennsylvania ranked sixth nationally in attracting private investment in clean energy, at \$841 million.

Industrial energy efficiency technologies – such as combined heat and power, which produces heat and power from a single fuel source, and waste heat to power, which uses wasted heat from industrial processes to generate electricity – offer Pennsylvania's manufacturers and institutional energy users and opportunity to significantly cut their energy costs and improve business resiliency, according to the report. Both technologies meet the state's Advanced Energy Portfolio Standards.

In 2013, Pennsylvania ranked sixth for total installed capacity of these technologies (3.3 GW), eighth for capacity added that year (6.6 MW), and eighth for private investment in this sector (\$9.9 million).

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The Alternative Energy Portfolio Standards require that 0.5 percent of the state's electricity come from solar power by 2021. In addition, the state's Sunshine Solar Rebate Program provided \$100 million in financing assistance for homeowners and businesses. Partly as a result of these policies, Pennsylvania ranks ninth in homes powered by solar (nearly 25,000), 11th in capacity added in 2013 (212 MW), and 11th in jobs supported by the industry (2,900).

However, according to the report, the sector has had some challenges in recent years. The state allowed imports of electricity from out-of-state solar projects to qualify for its Alternative Energy Portfolio Standards, effectively outsourcing some of the economic benefits the standards were designed to generate in-state. This decision also made Pennsylvania vulnerable to the market impacts of weakened policies in nearby states, such as Ohio, which imposed a two-year freeze on its own renewable portfolio standard in 2014.

The Pew Charitable Trust report, *Clean Economy Rising: Industrial Energy Efficiency Thrives in Pennsylvania*, is available at: http://www.pewtrusts.org/~media/assets/2014/12/clean_energy_pa_policy_brief.pdf.

Solutions for Urban Runoff's Effects on Fish

Coleen P. Engvall
Research Analyst

In a previous issue of the Environmental Synopsis, we examined a report that called for an overhaul in Pennsylvania's storm water systems. The report recommended various methods and reasons for implementing so-called "green infrastructure."

Green infrastructure focuses on slowing storm waters and allowing them to seep into the soil where they are natural detoxified and filtered, as opposed to

the traditional method of channeling the water away from the location as quickly as possible. Traditional gray infrastructure has been shown to increase pollutants entering waterways, especially when overwhelmed by heavy rainfall.

On the West Coast, they have been having a similar problem with pollutants reaching rivers and streams. In fact, researchers have recently been able to point to urban runoff as the reason for the alarmingly-high mortality rate of an endangered species of fish, the coho salmon.

The coho salmon has been devastated in the past decade as they return to freshwater rivers to spawn. More than 50 percent of these returning fish have per-



The researcher found that they could completely eliminate the lethal effects of the runoff simply by

ished prematurely year after year. Runoff from urban centers and highways has been shown by researchers to be a lethal blow to these adult fish.

They published their findings in the *Journal of Applied Ecology*, entitled *Coho Salmon Spawner Mortality in Western US Urban Watersheds: Bioinfiltration Prevents Lethal Storm Water Impacts*.

A study published in the Journal of Applied Ecology finds that highway runoff, which is normally deadly to the coho salmon, can be treated with just sand and soil

This study stands out from other research on this problem in that it directly shows the cause of the fish mortality.

The researchers mention that past studies have focused on forensic evidence and have eliminated many of the other possible causes for the deaths, such as water temperature and outside disease. Preliminary studies have also pointed to a correlation between the amount of impervious surfaces such as cement and buildings and the number of fish deaths.

With these studies as a starting point, they exposed healthy adult coho salmon to three types of water. The first being a fabricated mixture meant to imitate urban runoff. Untreated runoff from highways was examined next. The last was treated runoff. While it should be no surprise that the salmon fared the best in the treated water, it could be surprising as to how it was treated.

filtering the water through a column of sand and soil. This is a similar, if not more direct method than employed by the green infrastructure technologies such as bioswales and green roofs. This method was so effective that the fish, which were shown to die as quickly as four hours after exposure to the untreated runoff, all survived when exposed to the treated water.

This research shows an inexpensive and simple way to treat badly polluted runoff. The researchers also mention in their report that these findings show the benefit of incorporating more water-slowing green infrastructure as a way to improve overall stream health.

To read *Coho Salmon Spawner Mortality in Western US Urban Watersheds: Bioinfiltration Prevents Lethal Storm Water Impacts*, go to: <http://online.library.wiley.com/doi/10.1111/1365-2664.12534/epdf>

On the Horizon *A Look at Upcoming Events*

Monday, November 16, 2015, 12 noon *Environmental Issues Forum*

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

The guest for our November forum will be Mr. Chuck Coup, program manager for the Pennsylvania Sustainable Forestry Initiative. Currently celebrating their 20th anniversary, PA SFI is a program committed to promoting sustainable forest management and responsible forestry practices throughout the Commonwealth. One of the organizations most acclaimed initiatives is their Professional Timber Harvester Training Program, which to date, has trained over 7,000 loggers in sustainable tree harvesting techniques.

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*



Committee chairman, Senator Scott Hutchinson (pictured above, left), questions a testifier following their presentation. The committee heard wide-ranging testimony, all of which suggested that commercial and fleet NGVs are beneficial for both the environment and the economy.

On October 1, 2015, the Joint Legislative Conservation Committee held a public hearing in Finleyville, Washington County, at the request of Representative Rick Saccone (R-Allegheny/Washington). The subject of the hearing was commercial applications for natural gas vehicles and the associated benefits for air quality and energy security. The committee received testimony from the state Department of Environmental Protection, the natural gas industry and local businesses with firsthand experience in NGV applications.



Executive Director Tony Guerrieri (pictured at left), poses for a photo with several members of the committee who were present for the hearing. From left to right: Tony Guerrieri, Senator Camera Bartolotta, Representative Patrick Harkins, Representative Rick Saccone and Senator Scott Hutchinson.



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The Chairman's Corner

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The eight waters selected for the program correspond with the eight commission districts, meaning that wherever you reside there is likely a Keystone Select Stocked Trout Waters stream within driving distance.

The eight streams initially selected for the program include:

- **Chester County, Middle Branch White Clay Creek, Section 3** (1.67 miles)
- **Dauphin County, Wiconisco Creek, Section 3** (0.74 miles)
- **Lackawanna/Wyoming Counties, South Branch Tunkhannock Creek, Section 4** (0.99 miles)
- **Lawrence County, Neshannock Creek, Section 3** (2.67 miles)
- **Lycoming County, Loyalsock Creek, Section 5** (1.49 miles)
- **Potter County, First Fork Sinnemahoning Creek, Section 4** (1.67 miles)
- **Somerset County, Laurel Hill Creek, Section 3** (2.33 miles)
- **Westmoreland County, Loyalhanna Creek, Section 3** (1.67 miles)

For those concerned about a potential "gold rush" of anglers descending on these waters and depleting the newly-stocked behemoths, the commission ensured each stream was covered under

their Delayed Harvest Artificial Lures Only regulations. Under DHALO guidelines, anglers may fish the waters year round with artificial lures and flies, but are only able to harvest the fish in the late summer, between June 15 and Labor Day. During the rest of the year, the stream is strictly catch-and-release only, meaning these large trout can be caught multiple times.

As we head into the 2016 trout season, the stocking schedule for the Keystone Select Stocked Trout Waters program will largely parallel the statewide stocking program. Waters in Dauphin and Chester counties will be stocked prior to the regional opening day on April 2. The other six streams will be stocked shortly before the statewide opening day, which falls on April 16. All eight waters included in the program will be stocked again in-season – sometime in late April – leaving plenty of trophy trout for the spring and summer months.

If you or someone you know is interested in taking advantage of the Keystone Select Stocked Trout Waters program, the commission's website is a great place to start when planning your next excursion. By visiting www.fishandboat.com, anglers can find the agency's laws and regulations, detailed stocking schedules, maps of approved waterways, as well as tips and tricks to make your next fishing trip a success. The agency's mobile app, Fish-BoatPA, even lets you take this valuable information with you on-the-go.

So whether you're trying to hook into a trophy brown trout on that new fly rod or just need a little more bravado for your next water cooler fish tale, the Keystone Select Stocked Trout Waters program is a great opportunity to find photo-worthy trout right in your backyard. When winter finally releases its icy grip next spring, grab a pole, throw on some waders and enjoy Pennsylvania's great outdoors.



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