



The Environmental Synopsis

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

SEPTEMBER 2016



The Chairman's Corner

**Senator Scott E. Hutchinson,
Chairman**

The U.S. National Park Service plays an important role in protecting our country's most

iconic landmarks. From breathtaking landscapes, like the Grand Canyon and Rocky Mountains, to historic battlefields and monuments, the National Park Service enjoys a storied tradition of conserving and protecting our nation's natural and cultural heritage. This year, the agency is celebrating its centennial anniversary and marking the occasion with activities for the entire family.

National parks existed long before the creation of National Park Service, beginning with the designation of Yellowstone National Park in 1872. Over the next several decades, the number of national parks rapidly increased as the public sought to protect important natural areas from private development. The U.S. Department of the Interior was originally tasked with overseeing national parks and monuments, but by the early 1900s, it became clear that an independent agency was needed to manage the growing national park system.

On August 25, 1916, President Woodrow Wilson signed the National Park Service Organic Act, which established a new bureau in the Department of the Interior to manage the 35 existing national parks and monuments. Stephen Mather, a successful

2016

National Park Service CENTENNIAL

entrepreneur and conservationist from New York, was appointed as the first director of the National Park Service and developed criteria for establishing new national parks and monuments.

Today, the National Park Service oversees 411 sites, including national seashores, monuments, historic sites, recreation areas and more. Its lands total more 84 million acres in all 50 states and

see over 300 million visitors each year. To operate such a large network of parks, the agency employs over 22,000 professionals, from park rangers in their trademark "Smokey Bear" hats, to part-time and seasonal maintenance staff. The agency also heavily relies on the work of volunteers, whose ranks currently total over 200,000.

Pennsylvania is home to 19 National Park Service sites, one of the highest totals in the nation. From well-known destinations such as Independence Hall and Gettysburg, to more obscure locations, such as Edgar Allen Poe's home in Philadelphia, the Commonwealth is well represented in the national park system. One of these locations, the Delaware & Lehigh National Heritage Corridor, hosted the Joint Legislative Conservation Committee for a tour last month, where members and staff learned about several new trail linkage projects going on within the

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Notes from the Director

Tony M. Guerrieri, Executive Director

It surprises many people to learn that Pennsylvania is home to one of the largest elk herds in the northeastern United States. Historically, elk roamed throughout much of Pennsylvania, but as more of the state was settled, the elk population gradually declined. By the late 1800s, Pennsylvania's native elk was completely eliminated from their natural range in the state and the rest of the Northeast. By the time the Pennsylvania Game Commission (PGC) launched an effort to reintroduce elk to Pennsylvania, the animals had been gone from the state for almost 50 years.

In the early 1900s, the reestablishment of wildlife was a prime consideration of the PGC. When Yellowstone National Park officials announced that they needed help in reducing the elk population in the park in 1913, PGC officials decided to import some of those elk into the Keystone State.

That year, the PGC reintroduced 177 Rocky Mountain elk from Yellowstone National Park to northcentral Pennsylvania and the elk that live here today are the offspring of those animals.

In 1971, the PGC conducted the first elk census, which detected a population of 65 individuals. The herd grew to 135 by 1981. Plans for a limited elk hunt to control the population in 1983 lacked local public support and the herd stabilized between 120 to 150 individuals. By 1993, the population had increased to 224, and by 2000, the herd stood at an impressive 650 animals.

A three-year trap-and-transfer program launched by the PGC in 1998 expanded the elk's range from 350 to 800 square miles, allowing the herd to grow further. Aggressive management of habitat for elk also has helped to boost the number of elk and steer them into areas where they are less likely to conflict with humans.

Totally eradicated from our state in the late 1800s, Pennsylvania's elk herd has reached over 1,000 individuals within a five-county area.

In 2001, the state held its first modern-day elk hunt in more than 70 years when the PGC provided a limited number of hunting permits to manage the state's expanding elk herd. At that time, hunters paid a non-refundable \$10 application fee for the chance at an elk license. The PGC held a public drawing to determine which hunters were eligible. Resident hunters whose names were drawn were charged \$25 for an elk license and non-residents were charged \$250.

In 2015, almost 27,600 hunters applied for elk licenses and the \$10 fee added \$275,920 to the Game Fund, the PGC's general funding source. During last year's elk season, the PGC issued 21 licenses for antlered bull elk and 95 for antlerless cows. Hunters harvested 20 bulls and 65 cows during the regular season. The elk herd has grown to the point where this year the PGC will have 124 licenses, 25 antlered tags and 99 antlerless tags. Prized as one of the true "big game" species, cows can weigh 400 pounds, while bulls can reach upwards of 1,000 pounds.

Illegally killing an elk out of season is a serious offense and carries up to \$15,000 in fines and 36 months in jail, plus hunting license revocation. In addition to those penalties, those convicted of illegally killing a trophy-class elk must pay a mandatory \$5,000 replacement cost.

Two thousand and thirteen was the 100-year anniversary of efforts to restore elk to Pennsylvania, and it marked a

major milestone for hunters and non-hunters alike. In commemoration of that landmark anniversary, tours and special events were scheduled throughout the fall to celebrate.

Over the years, elk expansion efforts have met both support and resistance. Farmers and agricultural groups expressed concern about the possible damage elk could do to corn and other grain fields. As a result, the PGC has worked with farmers to fence fields, and to remove elk that were severely damaging crops. There also has been concern about the hazard elk could pose for Pennsylvania motorists. Accidents involving elk have led to injury, damage to personal property and even deaths.

Today, Pennsylvania's elk herd contains about 1,000 animals living in parts of Elk, Cameron, Clinton, Potter and Clearfield counties in the northcentral part of the state.

The September and October mating season is considered the best time to view elk, although late fall and winter also provide good viewing opportunities. Many people make the trip to Benzetette, Elk County, to explore the Elk Country Visitor Center. Often visitors can see elk roaming along the road or at specific viewing areas. Sometimes they can be as little as 10 yards away from the road. The sight and sound of a big bugling bull elk is something that is hard to forget.

Over a century after the first reintroduction efforts began, the elk's restoration represents one of the great successes in wildlife conservation history. If you or your family have a free weekend this fall, take a ride up to the Pennsylvania Wilds and get up-close-and-personal with one of the most majestic creatures to call our state home.

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.

California's Street Trees are Worth an Extra \$1 Billion

Tony M. Guerrieri
Executive Director

Trees are an important part of the urban streetscape and local officials across the nation have made formal commitments to increasing the number of street trees, citing the social and environmental benefits. Trees help reduce storm runoff, absorb carbon dioxide and lower ambient temperatures. They benefit everyone, not just those with trees in front of their business or home.

A new report from the U.S. Forest Service's Pacific Southwest Research Station estimates trees along California's public streets, avenues and boulevards provide benefits and cost savings to communities and residents worth \$1 billion. The report, *Structure, Function and Value of Street Trees in California, USA*, is the most up-to-date and comprehensive inventory of "street trees" within California.

To come up with that figure, researchers scrutinized data from over 900,000 trees in 50 California cities. Using municipal inventories analyzed in iTree, a computerized tree inventory and management program, researchers were able to create a composite picture of not only the number of California's street trees, but also their species, size, location and associated benefits.

According to the report, trees lining city streets are worth \$839 million just for the beauty they contribute by provid-

ing more privacy and better views, or more generally, the value added to property. Because trees provide shade, they lower energy demand for cooling and heating – which means savings for households and businesses, adding another \$101 million value.

Removing air pollution like ozone and particulate matter adds \$18 million, and their storing carbon abilities adds another \$10 million each year. The wet-weather flow reduction saves residents about \$41.5 million each year, the report said. For every dollar spent on planting or maintaining a street tree, California's street trees returns on average \$5.82 worth of benefits and cost savings each year. These trees are benefiting their communities 24 hours a day, 365 days a year.



Each California street tree is worth close to \$111. Since it only takes about \$19 to maintain each tree annually, they add a tremendous amount of value to California and its residents.

Further, the state's street trees ability to remove nearly 600,000 metric tons of

carbon dioxide emissions out of the air has the same impact as if removing 120,000 cars from the road, according to the report.

Taking into account the multitude of benefits they provide, the U.S. Forest Service estimates that each California "street tree" is worth approximately \$111.

The report notes that there is significant diversity in California street trees. Throughout the state, only the London plane tree accounted for more than 10 percent of the total, which the report said indicated good state-wide diversity. However, the majority of California communities surveyed were over-reliant on a single species of tree, making those ecosystems vulnerable targets of pests or pathogens.

An estimated 9.1 million trees lined California's streets and boulevards in 2014, up from 5.9 million in 1998. That averages out to about one street tree for every four residents. But tree density, or the number of trees in a particular area, has decreased. In the late 1980s, there were roughly 105 trees per mile on average; now there are only 75, nearly a 30 percent drop.

The report also highlights trends and tree demographics that will help guide urban foresters in determining what types of trees provide the maximum economic and environmental impact and, more im-

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portantly, where to plant them. For example, heat from city sidewalks, streets and parking lots, along with invasive species, can damage trees planted along thoroughfares. It is important to plant trees in the right places so that they will do well in harsh urban environments.

California's urban forests still have plenty of potential for growth. According to the report, room remains for another 16 million street trees to be planted, if resources allowed.

The U.S. Forest Service report, *Structure, Function and Value of Street Trees in California, USA*, is available at: http://www.fs.fed.us/psw/publications/mcpherson/psw_2016_mcpherson004.pdf.

Endangered Species Designation Delay

Coleen P. Engvall
Research Analyst

In 1973, the United States passed the Endangered Species Act (ESA), making the commitment to protect vulnerable plants and wildlife. The act is considered to have been effective in recovering thousands of declining species. The problem, however, is that the act can only help a species once it has been designated as endangered or threatened.

It is important to remember that any species can be classified endangered or threatened, not just the larger, more iconic animals such as the bald eagle. Smaller, less glamorous animals and many plants do not receive the public support that eagles or grizzly bears receive, but these species can be just as vital to a healthy ecosystem, and would hopefully be afforded the same attention and action.

Researchers at the University of Missouri argue in a new study that more can be done to assist those species who are out of the public spotlight. They released their report, *Taxa, Petitioning Agency, and Lawsuits Affect Time Spent*

Awaiting Listing Under the U.S. Endangered Species Act, in the *Journal Biological Conservation*.

The authors examined the wait times of 1,338 species since the conception of the ESA. They compared these times to influential variables in an attempt to determine what pressures pushed species through the process faster and which species benefited the most from these trends. The influential variables are unsurprising, but the extent to which they could hasten or burden the process was of concern to the researchers.

Not all living things are created equal when it comes to designation under the Endangered Species Act, say researchers from the University of Missouri.

They began by considering the budget for the listing and the policy phase. In order to close in on more specific impacts, they expanded their approach to include taxonomic classification, petitioning agency and lawsuits filed. Overall, the variable with the strongest correlation was taxa, which differentiates species into classifications such as vertebrates, invertebrates, animals, plants, etc.

For the ESA, vertebrates were routinely processed faster than any other taxa. Vertebrates include all mammals and other animals with spinal columns, such as birds and reptiles. Flowering plants and invertebrates were processed the slowest. One reason for this could be as simple as sympathy. The general population is more responsive to mammals in peril than grasses, and will accordingly put more pressure on the government to take action.

This relationship ties into two other variables addressed in the study: citizen petitions and budget sizes. The re-

searchers express concern that bias towards vertebrates can lead to critical species being overlooked in favor of something more charismatic. However, they do note that public participation consistently produces positive results for the species in question.



Under the ESA, a species is required to be processed within two years. However, the actual processing times range from 6 months to 38 years. Even though the program is over 40 years old, experts are still adapting to the constant influx of threatened or endangered species.

The findings out of the University of Missouri are significant for the future of the program. Threats to species and habitats can move very quickly, and protection has a better chance of leading to recovery if these impacts are addressed early. However, if a species waits for 12 years for its designation, which the report cites as the average wait time, protecting it can become very costly, or even impossible.

In fact, the report notes that there is a strong correlation between wait time and recovery time. When the designation process takes less than two years, the species has a very strong chance of being delisted. This study's findings come shortly after the publication of another report concerned with levels of biodiversity all over the world. Healthy biodiversity makes ecosystems more stable and more resistant to disaster and other threats. Addressing deficiencies in the

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ESA would be a first step towards safeguarding biodiversity here in the U.S.

To read the press release for Taxa, Petitioning Agency, and Lawsuits Affect Time Spent Awaiting Listing Under the U.S. Endangered Species Act go to: <http://munews.missouri.edu/news-releases/2016/0810-many-endangered-species-face-long-waits-for-protection/>.

Stricter Air Pollution Limits Could Save Lives

Tony M. Guerrieri
Executive Director

Modest reductions in two air pollutants, ozone and fine particulate matter (PM_{2.5}), would likely save thousands of lives each year, result in far fewer serious illnesses and dramatically reduce missed days of school and work, according to a report by the American Thoracic Society (ATS), a professional organization of more than 15,000 medical doctors, nurses and other healthcare professionals.

The report, *Estimated Excess Morbidity and Mortality Cause by Air Pollution above ATS Recommended Standards: 2011-2013*, highlights the annual health benefits of meeting more protective standards recommended by the ATS for ozone and PM_{2.5} than those of the U.S. Environmental Protection Agency (EPA).

The ATS, in collaboration with the Maron Institute of Urban Management at New York University, analyzed nationwide air quality from 2011 to 2013. It found that meeting a 0.060 parts per million (ppm) 8-hour standard for ozone, rather than the EPA's 0.070 ppm standard, and an 11 micrograms per cubic meter annual standard for PM_{2.5}, rather than the EPA's 12 micrograms per cubic meter standard, would reduce harmful impacts to humans in several ways. According to ATS, these reductions would:

- Save approximately 9,320 lives, which is comparable to the number of lives lost annually to drunken driving;

- Reduce "serious health events," such as heart attacks, hospital admissions and emergency room visits, by 21,400; and
- Decrease "adverse impact days," during which people may not be able to work, go to school or otherwise be physically active because of severe breathing problems, by over 19 million days.

The ATS recommended standards for ozone and PM_{2.5} are based on epidemiological studies linking various health effects to air pollution exposure.

The EPA sets standards for six principal air pollutants to meet its obligation under the Clean Air Act to protect the health of the American public by an adequate margin of safety. In addition to ozone and particulate matter, the other pollutants are lead, carbon monoxide, nitrogen oxide and sulfur dioxide.

Modest reductions in the EPA limits for two common air pollutants could result in 500 less deaths a year in Pennsylvania, according to the American Thoracic Society.

The report identified ten metropolitan areas that would benefit the most from more protective ozone and PM_{2.5} standards. They include:

- Los Angeles, CA: 1,341 lives saved, 3,255 fewer morbidities and almost 3 million fewer impacted days
- Riverside, CA: 808 lives saved, 1,416 fewer morbidities and 1.3 million fewer impacted days
- New York City, NY: 282 lives saved, 977 fewer morbidities and 818,666 fewer impacted days
- Phoenix, AZ: 283 lives saved, 598 fewer morbidities and 636,730 fewer impacted days
- Pittsburgh, PA: 285 lives saved, 533

fewer morbidities and 281,858 fewer impacted days

- Fresno, CA: 260 lives saved, 672 fewer morbidities and 390,551 fewer impacted days
- Bakersfield, CA: 241 lives saved, 333 fewer morbidities and 220,722 fewer impacted days
- Houston, TX: 229 lives saved, 661 fewer morbidities and 636,211 fewer impacted days
- Cleveland, OH: 196 lives saved, 487 fewer morbidities and 231,859 fewer impacted days.
- Cincinnati, OH: 173 lives saved, 298 fewer morbidities and 192,989 fewer impacted days



Philadelphia was ranked 15th with 126 lives saved, 284 fewer morbidities and 232,031 fewer impacted days. The Montgomery/Bucks/Chester county area was ranked 28th with 75 lives saved, 157 fewer morbidities and 165,203 fewer impacted days. According to the report, more protective air quality standards would prevent almost 500 deaths a year in Pennsylvania.

The report states that its results are conservative. It did not count deaths from cancers that take decades to develop or deaths from the exacerbation of other chronic illnesses such as diabetes.

While air pollution puts everyone at

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risk, it is most dangerous to children, the elderly and others with existing respiratory and cardiovascular problems. On high pollution days, they can land in the hospital with more severe asthma, sudden heart attacks and strokes, worsened pneumonia and other illnesses that can be fatal.

The report was published in the August edition of the *Annals of the American Thoracic Society*, a peer-reviewed journal. The report, *Estimated Excess Morbidity and Mortality Caused by Air Pollution above American Thoracic Society Recommended Standards: 2011-2013*, is available at:

<http://www.thoracic.org/about/newsroom/press-releases/journal/health-of-the-air-ats-nyu.pdf>.

Cleaner Air Contributing to Cleaner Chesapeake

Coleen P. Engvall
Research Analyst

The health of the Chesapeake Bay's water has long been ailing, impacting the plants, animals and humans that depend on it. However, scientists from the University of Maryland had good news to report. While the Bay's health is still far from perfect, 2015 showed that the overall health of the estuary had improved. For many, this appeared to be the culmination of years of work, regulation and best management practices. Certainly, regulations on point-source pollution, such as discharge from a factory or a waste management facility, have become much more stringent in recent years.

This year, researchers at the University of Maryland asked if these improvements in the Bay could stem from different sources. In 2013, they tested water in forested areas, to see if water quality was improving away from point-source



pollution and non-point-source pollution, such as farm or urban runoff, since these two categories of pollution are the usual suspects for decreases in water quality. Surprisingly, they found that waterways removed from most human activity were also seeing decreases in nitrogen pollution. This evidence suggests that there was a different variable responsible for improvements in the Bay's water quality.

Earlier this year, the researchers published a follow-up study entitled, *Declining Nitrate-N yields in the Upper Potomac River Basin: What is Really Driving Progress under the Chesapeake Bay Restoration?* The report, which was published in the *Atmospheric Environment Journal*, again questions the assumptions of how pollution is being reduced.

The authors conducted the study to discover whether or not air pollution reductions have led to a more significant impact on the Chesapeake watershed than water quality regulations.

The Clean Air Act may have positively impacted the health of the Chesapeake Bay waters, according to researchers at the University of Maryland.

To explore this possibility, the scientists combined their data with that collected by the Environmental Protection Agency, the U.S. Geological Survey and the National Atmospheric Deposition

Program. Using this data set, the researchers compared nitrogen concentrations in water to those in the atmosphere, as well as the implementation of air pollution regulations.

They found that aquatic concentrations of nitrogen corresponded to increasingly stringent amendments to the Clean Air Act as well as other subsequent nitrogen-reducing regulations. For example, in 1996, emission limits were put on coal-fired boilers. This regulation resulted in nitrogen oxide concentrations dropping by over a third. The researchers found that this coincided with reduced levels of nitrogen dioxide in water samples.

Nitrogen from the air enters water and soil after it has been released into the atmosphere from activities such as burning fossil fuels. Once airborne, it eventually settles on the planet's surface. The researchers argue that these atmospheric regulations had more of an impact on the Chesapeake Bay's health than point-source reductions or even best management practices such as riparian buffers.

One of the authors stated that such practices impact only a small area of one waterway, while atmospheric nitrogen affects the entire Chesapeake watershed. Even non-point source pollution, such as fertilizer runoff from farms, only pollutes the tributaries that the facility is in direct contact with.

The researchers caution that there are many variables effecting water quality in all of the areas tested, such as uptake by trees and other groundcover. While the evidence in this study supports their conclusion, they urge more research to be conducted in order to isolate other factors impacting the watershed's health.

To read *Declining Nitrate-N yields in the Upper Potomac River Basin: What is Really Driving Progress under the Chesapeake Bay Restoration?* go to: http://www.umces.edu/sites/default/files/Eshleman%20study_Atmospheric%20Environment.pdf.

On the Horizon *A Look at Upcoming Events*

Thursday, September 29, 10 a.m. *Forestry Task Force Meeting*

Celebration Hall, 2280 Commercial Boulevard,
State College

The first presentation, featuring guests from the PA Association of Conservation Districts and the Office of the Attorney General, will discuss the regulatory relationship between the forestry industry, local municipalities and county conservation districts. The second presentation, featuring the PA Sustainable Forestry Initiative, will explore the decline in qualified timber harvesters and other forestry-related occupations.

Monday, October 24, 12 p.m. *Environmental Issues Forum*

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

The topic of the October Environmental Issues Forum will be Pennsylvania's updated State Wildlife Action Plan. Jointly authored by the Pennsylvania Fish and Boat Commission and Pennsylvania Game Commission, the plan seeks to conserve the state's 664 threatened or declining fish and wildlife species. Representatives from the PFBC and the PGC will provide an overview of the updated State Wildlife Action Plan and its importance to our fish and wildlife resources.



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Committee Chronicles *A review of memorable committee events*

On Tuesday, August 23, the committee traveled to Carbon County for a tour of the Delaware & Lehigh National Heritage Corridor. The tour featured a roundtable discussion on the history of the corridor and its economic impact in the region, along with several new linkage projects that will help connect the D&L with other communities in eastern Pennsylvania. Following the discussion, the group toured historic Jim Thorpe, where they viewed downtown revitalization projects fueled by the town's reputation as an outdoor recreation hotspot.

Members of the committee (pictured at right) met at the Lehigh Gap Nature Center for a presentation by Elissa Garofalo, executive director of the D&L National Heritage Corridor. Present, from left, were Rep. McCarter, Sen. Yudichak, Elissa Garofalo, Sen. Argall, Rep. Quinn, Sen. Hutchinson and Rep. Heffley.



One of the most popular downtown revitalization projects in Jim Thorpe is the Mauch Chunk Opera House (pictured above), a fully restored 19th century theater known for its intimate setting and acoustics. The concert venue has hosted national recording artists such as Richie Havens and John Oates.



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The Chairman's Corner

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corridor. It was impressive to see the impact this national heritage corridor is having on the surrounding community.

To celebrate their 100th birthday, the National Park Service has planned special events at locations across the U.S. as part of their Find Your Park initiative. The initiative seeks to personalize the national park experience by hosting lectures, demonstrations or displays incorporating aspects of America's heritage. Every weekend through October, for instance, Gettysburg National Military Park is hosting displays that include Civil War encampments and demonstrations of the tools, tactics and weapons the soldiers used during the legendary battle. You can find a complete listing of special centennial events going on from Coast to Coast by visiting www.findyourpark.com.

Another way the National Park Service is commemorating their centennial anniversary is through free admission days. This year, the agency offered 16 days where the public can visit any national park site free of charge. Depending on the park you visit, this promotion could save you up to \$30 per person. The last free admission day is Veterans Day on November 11, so I encourage you to take advantage of the opportunity while you still can.

In a display of support, other federal agencies are helping to commemorate the National Park Service's centennial anniversary. The U.S.

Mint is issuing three limited edition coins, including a five-dollar gold coin, a silver dollar and a half

dollar coin. The coins feature images of iconic national parks and the National Park Service's arrowhead logo. The proceeds will go to supporting new projects and initia-

tives within the national park system. The U.S. Postal Service recently unveiled a new 16-stamp collection that features images from national park sites across the nation.

As you can image, managing and preserving over 400 national park sites is a massive undertaking. One of the biggest reasons for the National Park Service's success over the last 100 years has been its partnership with the non-profit National Park Foundation, which secures private donations and support for the entire national park system. Here in Pennsylvania, the Foundation contributed over \$30 million toward the construction of Flight 93 National Memorial in Somerset County. This generous donation has greatly accelerated the timeline for completing the nation's last unfinished September 11 memorial.

The National Park Foundation also assists students in discovering the natural, historical and cultural heritage found in our national parks. Their Ticket to Ride program provides transportation to a national park site for 30,000 students each year, many from disadvantaged communities. The Foundation also offers educational grants to teachers and schools looking to use national parks as a living classroom. In total, the Foundation has contributed over \$3.5 million in educational grants over the last three years.

The National Park Service has played a pivotal role over the last 100 years in preserving and maintaining America's most cherished landmarks. As we enjoy the remaining weeks of summer here in Pennsylvania, help celebrate the National Park

Service's 100th birthday by visiting a national park site near you.

You can learn more about the U.S. National

Park Service, and their centennial celebration, by visiting their website at www.nps.gov.

