

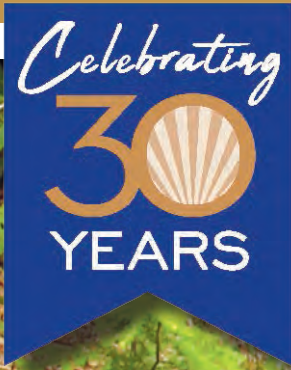
CHESAPEAKE

BAY JOURNAL

March 2021

Volume 31 Number 1

Independent environmental news for the Chesapeake region



Orange water, dirty air

What will it take to clean up abandoned mine land?

PAGE 16

SEARCHING FOR SEA GLASS



Join the hunt for weathered glass bits along the Bay **PAGE 28**

'MAKE A LITTLE NOISE'



Paddler devoted to the cause of cleaner shorelines **PAGE 11**

TIME FOR A LOW-SALT DIET



Road salt is harming freshwater streams **PAGE 26**

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A horseshoe crab, found in Delaware with a balloon and ribbon tangled in its legs, was rescued by a passerby. In Maryland, a bill aimed at reducing balloon releases is moving through the state legislature. See article, page 19. (Doug Bevinson/Courtesy of Balloons-Blow.org)

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EDITOR'S NOTE



Celebrating 30 years of the *Chesapeake Bay Journal*

Thirty years ago this month, the first issue of the *Bay Journal* rolled off a Baltimore press. It was March 1991. The headline on the cover story read, *Taking a new look at an old goal* — the topic was the regional agreement to reduce nutrient pollution in the Chesapeake Bay by 40%. That “old” goal is still with us. And so is the *Bay Journal*.

When the 12-page publication first hit mailboxes across the region, there was no web presence or social media to support the launch. There wasn't even much in the way of computer resources to help put the *Bay Journal* together. There weren't scores of grantmakers and thousands of individual people contributing to its budget. At the time, the *Bay Journal* was nested within the Alliance for the Chesapeake Bay, a regional nonprofit organization, and founding editor Karl Blankenship was the only journalist on staff. It was basically a one-man production.

What the *Bay Journal* did have, immediately, was 17,000 readers. That's because the Alliance was part of a network of citizens and state and federal leaders eager for news about the Chesapeake and the region's environment. It was also backed by creative leadership, in the form of Alliance director Fran Flanigan, who was known for thinking outside the box. Karl had been hired to create a newsletter, but he pitched a much larger idea, rare if not unknown within nonprofit groups: to publish a true newspaper. She not only endorsed the idea, but challenged Karl to think deeply about his role as a reporter and editor. You can read more about this story on page 10 of this issue.

Today, the *Bay Journal* is the premier source of independent environmental news for the Bay region. In the months ahead, we'll be sharing more stories and observations from the first three decades of the *Bay Journal*. I hope you'll enjoy the read. And, if you can, please share the *Bay Journal* with a friend.

— Lara Lutz



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ON THE COVER

Orange water, caused by acid mine drainage, flows through a tributary stream of Dutchman Run in Lycoming County, PA, within the McIntyre Wild Area of Loyalsock State Forest. See article, page 16. (Nicholas A. Tonelli/2013)

BY THE numbers

4.5

Number of inches that annual precipitation has increased in the Bay region during the last 100 years

30

Number of days the growing season has increased in the Bay region during the last 100 years

92

Percentage of the Bay with increasing temperature trends

4,500

The estimated number of peeps that an adult male spring peeper makes in a single night during breeding season

348

Number of species of finfish in the Chesapeake Bay

173

Number of species of shellfish in the Chesapeake Bay

Salamanders in the Chesapeake region

A variety of salamanders can be found across the Chesapeake Bay watershed, nestled into leaf litter along streams and mountain seeps, in wetlands and even underground.

In the spring, some species join the trek that amphibian fans call the “Big Night,” when frogs and salamanders return to the vernal pools of water where they were born to mate and lay eggs. Vernal pools are the shallow, temporary ponds formed by winter snow and rain. Most are gone by summer. The isolated ponds are a more protected breeding spot because they contain no fish that would otherwise prey on the amphibians’ eggs. Some salamanders, such as marbled and spotted salamanders, are completely dependent on the pools for procreation.

Here are some of the salamander species that you may spot as you explore the outdoors in the Bay region.

Source: Taylor Swanson



Dusky salamanders are found in small seeps and streams in the Appalachian mountains. Their range extends south to Georgia and north into Canada. (Andrew Hoffman/Flickr)



Northern red salamanders are found on spongy forest floors, often near wetlands. They come out during warm summer rains to forage. (Andrew Hoffman/Flickr)



Marbled salamanders are vulnerable to predation while migrating to vernal ponds in the spring, so they compensate by laying large quantities of eggs to ensure that some of their young survive. (John P. Clare/Flickr)



Northern two-lined salamanders are easily identified by the twin black stripes their backs. They love wet environments and will often spend their entire lives by the same stream. (DaveHuth.com/Flickr)



Eastern red-backed salamanders live in wet woodlands and can actually be either red or dark gray. They have no lungs, absorbing oxygen through their skin. (Judy Gallagher/Flickr)



Spotted salamanders live underground for most of the year and emerge in the spring to travel to vernal pools. (John P. Clare/Flickr)

LOOKING BACK

30 years ago

Bay cleanup pace lagging

A report from a special evaluation panel reported that voluntary programs aimed at controlling runoff from agricultural land were being adopted at too slow a pace to reach the goal of reducing nutrients in the Bay by 40% by 2000. The panel also concluded that estimates of nutrients controlled by many commonly used techniques were “probably optimistic.” ■

— Bay Journal, March 1991

20 years ago

Open water dredge disposal ends

The Maryland Port Administration and Chesapeake Bay Foundation reached agreement on a plan to end the open Bay disposal of material dredged from Maryland’s portion of the Bay and its tributaries. ■

— Bay Journal, March 2001

10 years ago

VA, MD promoting oyster aquaculture

Maryland, Virginia and the federal government were taking steps to expand aquaculture in the Chesapeake Bay, a move expected to surprise some coastal residents who could find themselves living next to shellfish farms. ■

— Bay Journal, March 2011



ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to producing journalism that informs the public about environmental issues in the Chesapeake Bay watershed. The *Bay Journal* is available in print and by email and is distributed free of charge, reaching approximately 100,000 readers each month. The print edition is published 10 times a year, and bundles are available for distribution at offices, libraries, schools, etc. Material may be reproduced, with permission and attribution.

Bay Journal Media also operates the Bay Journal News Service, which distributes *Bay Journal* articles and op-eds about the Chesapeake Bay and regional environmental issues to more than 400 newspapers in the region.

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STAFF

Lara Lutz, Editor (llutz@bayjournal.com)
Karl Blankenship, Editor-at-Large (kblankenship@bayjournal.com)
T.F. Sayles, Managing Editor / News Service Editor (tsayles@bayjournal.com)
Timothy B. Wheeler, Associate Editor / Senior Writer (twheeler@bayjournal.com)
Kathleen A. Gaskell, Copy / Design Editor (kgaskell@bayjournal.com)
Jeremy Cox, Staff Writer (jcox@bayjournal.com)
Ad Crable, Staff Writer (acrable@bayjournal.com)
Tamara Dietrich, Staff Writer (tdietrich@bayjournal.com)
Whitney Pipkin, Staff Writer (wpipkin@bayjournal.com)
Dave Harp, Photographer (dharp@chesapeakephotos.com)
Jacqui Caine, Marketing & Advertising Director (jcaine@bayjournal.com)

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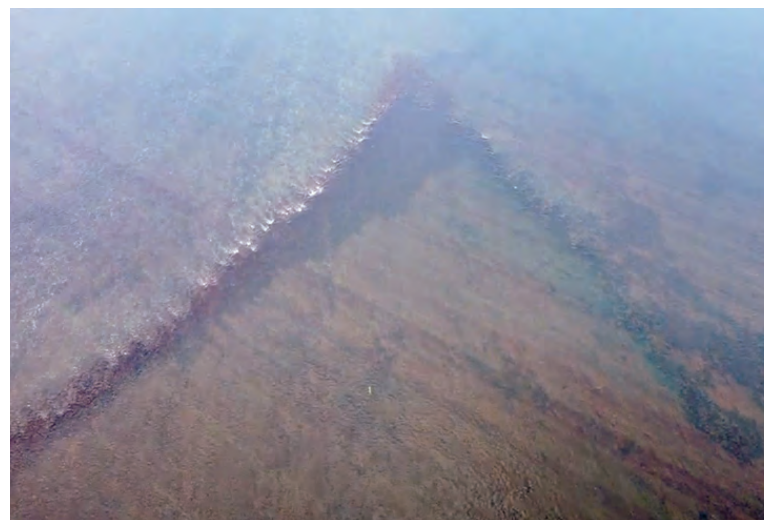
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Ad Crable's article about this old stone eel weir in the Susquehanna River, said to have been built by Native Americans, was very popular with Bay Journal readers and shared widely on social media. (Luke Wagner)

Eel weir article travels far and wide

Most people think that eels are an underappreciated species because of their snakelike appearance. But that may be changing if the response to *Ad Crable's* article about eel weirs in the Susquehanna River is any indication. The story, *Dozens of ancient eel weirs uncovered in the Susquehanna*, garnered the most views on our website of any *Bay Journal* article, with almost 72,000 to date, according to Google.

But it doesn't end there. The article has also been re-run in many newspapers, from the *Star Democrat* on Maryland's Eastern Shore to the *Wyalusing Rocket-Courier* in northern Pennsylvania. We've even heard of it being required reading in a science class.

"It took off beyond my wildest expectations," Ad said.

The story featured the effort of Van Wagner, a high school environmental science teacher from Danville, PA, to document the presence of eel weirs, many built centuries ago by Native Americans, in the Susquehanna River. Ad saw a reference to the project in the *Pennsylvania Environment Digest*, an online newsletter operated by former state Department of Environmental Protection Secretary Dave Hess.

The V-shaped weirs, constructed of stone, were used to funnel and capture eels, an important source of food. It turns out there are dozens (and possibly significantly more) of the weirs remaining in the river that have withstood centuries of floods and ice flows. "It thought it was fascinating and thought others would be fascinated, too," Ad said.

Apparently so. Not only has it been widely read, but Ad has been getting lots of emails from readers offering reminiscences and reports of weirs in the river, which he has been passing on to Wagner.

On another note, we were saddened to learn about the recent death of *Bill Blamberg* who, with his brother Clyde, were co-owners of Clyde's Sports Shop, an institution in Baltimore.

Bill had been a longtime supporter of the *Bay Journal*, and Clyde's was one of the earliest and remains one of the largest distributors of the *Bay Journal*. Introducing the *Bay Journal* to new readers is always a challenge, and Clyde's — started in a 15-by-20-foot building in 1957 by the brothers' father, Clyde — has been a huge help in those efforts.

— *Karl Blankenship*
Editor-at-Large

NY submits revised plan to meet Bay goals

New York has submitted a revised Bay cleanup plan which, unlike the one completed in 2019, meets the state's nutrient reduction goals — at least on paper.

The plans submitted by New York and Pennsylvania two years ago failed to show how the states would meet their pollution control goals by 2025. New York's revised plan mostly closes that shortfall not through additional actions, but by recalculating the amount of nutrients expected to be discharged from its wastewater treatment plants.

The state said its new calculation methodology better reflects actual observed conditions and takes into account the shrinking population in its portion of the Bay watershed, which contributes to reduced wastewater flows.

A review by the U.S. Environmental Protection Agency released in January agreed that the revised plan would meet the state's Bay obligations, though it asked the state to provide more documentation about the methodology behind its revised calculations.

The EPA's review continued to say, as it did for New York's original cleanup plan, that the

state should provide more detail about how it would pay for and achieve the significant nutrient reductions the state anticipates from agriculture and developed lands.

States in the Bay watershed have been working since 2010 to reduce the amount of nitrogen and phosphorus reaching the Chesapeake to help clear its water and reduce oxygen-starved dead zones.

In 2019, all of the states completed updated cleanup plans, but those submitted by New York and Pennsylvania did not achieve their share of the 2025 cleanup goals.

That shortcoming spurred Maryland, Virginia, Delaware, the District of Columbia, Chesapeake Bay Foundation and others last year to file a suit against the EPA in an effort to get the agency to require the two states to write adequate cleanup plans and do more to implement them. ■

Morgan State to study effects of microplastics in the Chesapeake

Morgan State University in Baltimore has received nearly \$1 million in federal funding to study the impact of microplastics polluting the Chesapeake Bay. The funding was awarded through the National Science Foundation's

Historically Black Colleges and Universities Research Infrastructure in Science and Engineering program, which supports research at HBCUs that offer doctoral degrees in science and engineering disciplines.

U.S. Sens. Chris Van Hollen and Ben Cardin and Congressmen Dutch Ruppersberger, John Sarbanes, and Kweisi Mfume (all D-MD) announced the grant in January.

"Microplastics pose an urgent threat to the health of oceans and watersheds around the world, especially for the Chesapeake Bay," the lawmakers said in statement. "This new federal grant funding will help Morgan State University lead the way in microplastics pollution research and accelerate aquatic cleanup efforts. It's a clear win-win — helping us to improve the health of the Bay while investing in the capabilities of our researchers at Morgan State." ■

Federal funds to help Alexandria reduce sewage in Potomac River

The U.S. Environmental Protection Agency announced in February a \$321 million loan to



Nihal Dennis, during in a 2019 "trash trawl," collects plastic from Virginia's Occoquan River. (Whitney Pipkin)

See **BRIEFS**, page 6

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From page 5

Alexandria Renew Enterprises for its RiverRenew Tunnel System project. This project aims to benefit public health and the environment by significantly reducing discharges of untreated wastewater to Hooffs Run, Hunting Creek and the Potomac River.

The tunnel system will redirect millions of gallons of sewage mixed with rainwater from combined sewer overflow outfalls to AlexRenew's Water Resource Recovery Facility. There, the water will be treated before being discharged.

"In spite of significant hurdles, RiverRenew is on track to meet its incredibly aggressive schedule," said AlexRenew CEO Karen Pallansch.

The EPA loan will finance nearly half of the project cost. The remaining funds will come from a state loan, state grants and cash contributions from AlexRenew on behalf of city residents and from Fairfax County. ■

PA ranks 6th in nation for its outdoor recreation economy

Pennsylvania was one of the top 10 states receiving the most dollars from outdoor recreation in 2019, ranking sixth in the nation with \$13 billion in revenue.

Among other states in the Chesapeake Bay



Enslaved Africans arrived at what is now the site of Virginia's Fort Monroe in 1619. (Dave Harp)

watershed, New York ranked fourth with \$29 billion in outdoor recreation dollars, according to the federal Bureau of Economic Analysis. Virginia ranked 17th with \$9 billion and Maryland was 23rd with \$7 billion.

Recreation revenue considered in the study included money spent on travel, accommodations, food, retail sales and employment related to manufacturing outdoors

products in each state.

Nationwide, outdoor recreation was a \$460 billion industry in 2019, a 1.3% increase over 2018, the report showed. The states with the highest recreational dollars were California, Florida and Texas, in order.

The statistics could see significant jumps in the next analysis, as COVID-19 drove many more people outdoors. ■

Boating/fishing was the top category of outdoor pursuits across the nation. Following was the use of recreational vehicles and motorcycles/all-terrain vehicles.

An official from the Pennsylvania Department of Conservation and Natural Resources said the report confirmed how much value Pennsylvanians place on their state parks and forests, which total 2.5 million acres.

"State and local parks, state forests and trails are true economic drivers worthy of investments to keep them open, safe and welcoming," spokeswoman Gretchen Leslie said. ■

UN designates Fort Monroe a part of Slave Route project

Fort Monroe, the Hampton Roads, VA, location where the first enslaved Africans arrived in an English colony, received international designation in February for the role the site played in the global slave trade.

Point Comfort, the present site of the Fort Monroe National Monument in Hampton, was where a ship called the White Lion arrived with the Africans in 1619 — just 12 years after Jamestown was settled — launching 246 years of slavery in what was to become the United States. It is one of 50 sites across several continents that have been designated a "Site of Memory" as part of the United Nations Educational, Scientific and Cultural Organization's Slave Route project.

The project is aimed at promoting better

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understanding of the causes, forms of operation, stakes and consequences of slavery around the world.

Virginia Gov. Ralph Northam announced the designation at the fort, where a historic marker will be placed on the grounds and an African Landing Memorial is planned.

“Fort Monroe is among the most significant historic sites connected to the institution of slavery, African American history, and the struggle for freedom,” Northam said. “In order to tell the full and true history of our commonwealth, the stories of the people and the events that took place here must be more present in our collective narrative.”

Fort Monroe — built at the site two centuries after the arrival of the White Lion — also played an important role at the end of slavery. During the Civil War, Fort Monroe was one of the first places enslaved people were granted freedom when the U.S. Army refused to return three freedom seekers seeking refuge in the fort to a slaveholder. ■

Scientists to study impact of acidification on Bay oysters

The excess carbon dioxide responsible for global warming also increases the acidity in oceans and the Chesapeake Bay.



The Baltimore Harbor trash wheel intercepts waterborne litter. (Dave Harp)

A team of researchers is taking a look at how that could impact the Bay’s oysters, as well as those who work to harvest, grow and restore them.

Increased acidity hampers the growth and survival of oysters and other shellfish by eating away at their calcium carbonate shells, the same process that causes carbonated sodas to corrode the enamel of human teeth. It also

reduces the number of carbonate ions dissolved in the water, making it more difficult for oysters to build their shells in the first place. Acidification is particularly challenging to oyster larvae and juveniles.

The three-year study is funded by the National Oceanic and Atmospheric Administration. The research team includes scientists from the Virginia Institute of Marine Science, Oregon

State University, Anchor QEA and the NOAA Chesapeake Bay Office.

“Coastal acidification and its associated co-stressors present a serious and credible threat to the success of both oyster aquaculture and oyster restoration in the Bay,” said Marjy Friedrichs of VIMS, one of the team leaders.

Co-stressors in the Bay include nutrient pollution, warmer water and pulses of freshwater from rainstorms. Previous research has shown that these factors can intensify the negative impacts caused by acidification alone. ■

Baltimore to get fourth trash wheel

Mr. Trash Wheel, Professor Trash Wheel and Captain Trash Wheel — which collect floating trash and debris as it floats toward the Patapsco River and Chesapeake Bay — are expecting a new member of the family.

Baltimore’s fourth trash wheel, located at the mouth of the Gwynns Falls, is expected to be in service this spring. The results of a public vote to name the wheel will be released soon. Among the options were Gwynnda the Good Wheel of the West, Doctor Gwynn, Trash Wheel, Lady Gwynnevere Trashington and Inspector Gwynn Trash Wheel.

The Maryland Port Administration and Waterfront Partnership of Baltimore are among the sponsors of the new wheel. ■

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Bay Foundation leader Will Baker retiring after 40 years

'A restored Bay is within sight. But we are not there yet'

By Timothy B. Wheeler

Will Baker, who's led the Chesapeake Bay Foundation for the last 40 years, announced in January that he plans to step down at the end of 2021 as the environmental group's president.

"I'm proud of the many things we have accomplished over the years," said Baker, 67, in a statement released by the foundation. "But there is a lot left to do in 2021 and beyond."

Baker joined the Bay Foundation as an intern in 1976, nine years after the group's founding, and has run the organization since 1981. In that time, it has grown from a handful of employees to a staff of 200, with 300,000 members and offices and programs in Maryland, Virginia, Pennsylvania and the District of Columbia. It's widely considered the preeminent nongovernmental group

advocating for the Bay's restoration at the state and federal level. Over the years, the foundation also has provided outdoor educational experiences about the estuary to more than 1.5 million students, teachers and others across the region.

In a telephone interview, Baker said he had been thinking "on and off" about relinquishing the reins of the organization, but he feels that now is the right time.

"We're in good shape financially, we've got a great team of vice presidents, the board is superb," he said. "This is the time to do it, when things are going well, not when they're going badly."

The foundation gave the Bay's health a D-plus grade in its latest report card issued in early January. That's the same letter grade awarded in the foundation's 2018 report, though the numerical score behind it slipped a point, from 33 to 32 out of 100. The score has risen only five points since the first report card in 1998.

Even so, Baker said there's been noticeable progress in the long-running restoration effort.

"When CBF was founded over 50 years ago, the Bay was dying," he said in a



Will Baker, longtime Chesapeake Bay Foundation president, plans to retire at 2021's end. (Mike Busada)

statement. "Today, a restored Bay is within sight. But we are not there yet. The recovery, while tangible, is still fragile."

The Bay watershed jurisdictions and

federal government are struggling to fulfill all of the restoration goals set for 2025.

Asked if he regretted leaving before the Bay restoration effort had succeeded, Baker said, "I want to see the Bay restored when I have time to be out there to enjoy it."

Baker said he wants to pursue other interests, too, but has nothing lined up to do upon retirement.

"I think it's good for me, but I also think it's good for CBF," he said. "Maybe I should have done this 20 years ago. New leadership is good. I look forward to watching CBF's next chapter."

Elizabeth Oliver-Farrow, chair of the foundation's board, said the group has succeeded at translating science into effective policies. "Will's decades of leadership and vision have made that success possible," she said, adding that the board is committed to a "broad and thorough" search for Baker's replacement.

Baker credited the foundation's accomplishments to the board and staff, whom he called "dedicated people committed to saving the Bay. CBF has given me more than I've given them. It's been my life, behind my family." ■



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MD approves natural gas pipeline for Eastern Shore

Move will serve county currently without access to natural gas

By Jeremy Cox

Despite setbacks and cancellations to some high-profile natural gas pipelines, a project on the Delmarva Peninsula has overcome strong resistance to gain the go-ahead from Maryland officials.

The Board of Public Works, presided over by Gov. Larry Hogan, on Jan. 27 unanimously approved a permit allowing Delaware-based Chesapeake Utilities to bore under three waterways. The company is extending an 8-inch-diameter pipeline 11 miles into Somerset County from existing lines in Wicomico County and southern Delaware.

The state signed a contract with the company in 2019 to supply natural gas to the University of Maryland Eastern Shore, which currently relies on fuel oil and propane, and the Eastern Correctional Institution, which uses wood chips. The change in fuel source is



A pipe is being prepared to extend a natural gas pipeline into Somerset County, MD, from existing lines in Wicomico County and Delaware. (Dave Harp)

expected to reduce carbon emissions nearly 40% at the historically Black university and 65% at the state prison, officials say.

Business and civic leaders in Somerset have long lobbied for natural gas in the hope it would spark an infusion of new businesses. It is one of three counties in the state that lack access to the fuel source.

received from the community.”

At a hearing in early December, the Board of Public Works signed off on a wetland permit for a northerly segment of the same pipeline, but not before a flood of speakers, most opposed to the project, kept the hearing going for more than three hours.

Some environmentalists contend that the project will expose residents near the pipeline to potential toxic leaks and explosions. They also say the move contradicts the state’s goal of reducing its reliance on fossil fuels and its ban on hydraulic fracturing within the state, although none of the gas supplied to the county will come from Maryland.

“I think [environmentalists] are right that natural gas and fossil fuels are on their way out, and we’re going to get to a renewable future with zero emissions,” said Comptroller Peter Franchot, one of the board’s other two members, along with Treasurer Nancy Kopp. But Somerset residents and businesses “don’t have access to natural gas like everyone else in the state does, and I think we have to recognize the incremental process we’re going through here.” ■

“Residents and businesses along the line will soon have the choice to use environmentally beneficial and less expensive natural gas service,” Chesapeake Utilities spokesman Justin Mulcahy said in a statement. “This project will help bring prosperity to Somerset County, and we are grateful for the outpouring of support the project has

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Photographer Dave Harp, Cat Point Creek in Virginia's Northern Neck. Photo by Leslie Middleton.

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Bay Journal beginnings: How a newsletter turned into a newspaper

By Karl Blankenshp

The first issue of the Bay Journal was published 30 years ago, in March 1991. This column is the first in a series marking the Bay Journal's 30th anniversary, highlighting its impact, its unique development as a nonprofit news source and our plans to continue serving readers in the years to come.

It seemed like an ominous beginning in January 1990, when I stepped into the Baltimore headquarters of the Alliance for the Chesapeake Bay.

One drawer in my desk, which seemed second or third hand, jammed. Another squeaked pretty badly whenever I tried to open it. And the DOS computer everyone shared crashed. A lot.

I began to think that I had made a terrible mistake, having left a secure position at the *Harrisburg Patriot-News*, where the computers were new, the desks functioned and I had liked the job. I covered the environment and had pretty much full rein over what I did.

Cindy Dunn, then the director of the Alliance's Pennsylvania office (who is now secretary of the Pennsylvania Department of Conservation and Natural Resources), persuaded me to apply for the Alliance's editor position, where I would produce a newsletter, the *Chesapeake Citizen Report*.

It was intriguing. If I was going into environmental journalism, it seemed a plausible way to learn about issues in detail — and without forking out money for an advanced degree.

Up to that point, I'd only seen the Chesapeake Bay a couple of times, while crossing the Bay Bridge. Being from the Great Lakes region, it mainly struck me as the world's largest mud puddle.

Now it was my job to understand it.

That wasn't easy. The state-federal Chesapeake Bay Program, which was in charge of "restoring" the Bay, was a mass of committees and meetings — monitoring, modeling, toxics, living resources, population growth and development, nonpoint sources and many more — all with their own terminology. It was like trying to learn a foreign

language, without a translator. Mostly, I became convinced that I'd discovered a confusing black hole of bureaucracy. Much of the time, I just wanted to walk away.

As I sometimes floundered in this mess, Fran Flanigan, the Alliance's executive director, kept emphasizing the importance of working to understand the issues and not just looking for a good quote. My predecessor had been widely praised for his depth of knowledge, and people kept telling me I had "big shoes to fill."

Somewhat grudgingly, I began to realize that the typical level of knowledge that a reporter gathered in a newsroom wasn't enough to understand the Chesapeake, or the Bay Program. But, I ultimately told myself, if all of these other people could understand this stuff, I could too.

Amongst all of the bureaucracy, there was a lot going on — and to learn. I visited Pennsylvania's shad hatchery and found out about efforts to revive a once-abundant fish that I never heard of before. I went on the Bay with scientists studying ecologically important underwater grasses. Until then,

I would have mistakingly thought they were seaweeds, like most everyone else.

Just a few years earlier, in 1987, the states had signed off on their second Chesapeake Bay Agreement, with scores of commitments to protect everything from wetlands and coastal dunes to waterfowl, finfish and shellfish along with high-

minded goals to manage growth. The most consequential goal, the one with measurable results, was to reduce the amount of nutrients reaching the Bay by 40% by 2000.

Although the ongoing battle with nutrients has come to define the whole Bay effort, it is interesting that the *Citizen Report* I produced had little to do with nutrients. Mostly, people were talking about wetlands

"Fran Flanigan, the Alliance's executive director, kept emphasizing the importance of working to understand the issues and not just looking for a good quote."



The first issue of the Bay Journal. (Karl Blankenship)

and whether there should be a no-net-loss goal. Growth, development, traffic and air pollution were all driving the conversations.

As 1990 drew to a close, things began to come together. I was slowly learning the Bay Program maze and beginning to understand the issues. And the work was important. There was huge interest in what was going on with the Bay. About 17,000 people were reading the *Citizen Report*, and high-level Bay Program meetings were packed with standing-room-only crowds.

At that time, a newspaper sales representative came to me with a new idea. Instead producing a newsletter, we could publish a newspaper. Printing on newsprint was fast and cheap compared to the heavy paper used by newsletters. We could produce 10 newspapers a year for less than the cost to produce six newsletters.

That's what the Bay effort needed. A

newspaper — one that would keep people up to date and explain often-complex issues in ways traditional newspapers rarely did. I discussed the change with Fran, who signed off on the concept. Thirty years ago this month, the first edition of the *Bay Journal* showed up in people's mailboxes, and the Alliance would go on to publish the paper for the next 20 years.

That first issue contained articles about the Bay's "toxics of concern" list, protecting loggerhead turtles and protecting Virginia's Chesapeake Bay Preservation Act.

There were also articles foreshadowing problems that would plague the Bay and guide much of my work for decades. The cover story dealt with the 40% nutrient reduction goal. Other articles highlighted new reports that said existing programs were unlikely to meet that goal. The *Bay Journal* was just getting started. ■

Fighting the plastics plague, one canoe-full at a time

PA man has waged trash war on Susquehanna's banks since 2017

By Ad Crable

John Naylor eased his 16-foot fiberglass canoe into the Susquehanna River near a small archipelago of forested and ever-changing mudflat islands known as the Conejohela Flats, once the domain of Native Americans and still a vital stop for migrating shorebirds.

It's a placid and beautiful spot on the lower Susquehanna between Lancaster and York counties, PA. But the York city resident was there this day to nibble at a growing sheen of ugliness — namely, single-use plastic containers, especially discarded water bottles.

The plastic comes down one of the world's oldest major river systems in alarming volumes and relentless waves after each high-water event. But that doesn't discourage the 57-year-old Naylor, who for the last four years has filled his canoe once or twice a week with plastics retrieved from the shallows, banks and shores.

To date, he has plucked more than 15,000 pieces of single-use plastics, as well as tons of other litter such as tires, barrels, foam, plastic chairs, flip-flops and more. He doesn't find many plastic bags, but that's because they sink in the water, becoming a different kind of menace, if not an eyesore.

For those who sometimes accompany Naylor on these "pickin'" trips, the sheer volume of litter, time after time, can be shocking and discouraging.

At one stop on an uninhabited, narrow woody island, you could barely take a step without dancing around plastic containers. But Naylor, wearing rubber wading boots so he can enter marshy areas, was undeterred. He reached over and scooped handfuls of water bottles, tennis balls, spent shotgun shells, pieces of foam, cigarette lighters and other cast-off items, depositing them in reused plastic trash bags in his canoe.

When the water is high, he has learned over the years, the entire island can act as a strainer for floating debris. The outer bank of any bend in the river is also a reliable trash trap. You can measure the height of the river's last flooding event by the line of deposited plastics. He also has learned, the hard way, to be cautious of plastic bottles and jugs filled with liquids, which might very well be what he calls "trucker bombs" — improvised



John Naylor of York, PA, collects plastic items and other debris from the often litter-strewn banks of the lower Susquehanna River. (Ad Crable)

urinals employed and unceremoniously discarded by long-haul truckers.

"People ask me, 'What are you doing? You're never going to get it all,'" Naylor said. "It's a little spot on the planet, but I just want to see the Susquehanna a cleaner river. I do it because one guy can make a little noise. It beats not making any noise."

Naylor's unrelenting crusade began on a February day in 2017 while he was complaining about the deluge of plastics he saw each time he paddled the river in one of his vintage wooden canoes.

"Quit bitching and do something about it," one of his buddies advised. So Naylor did, and he set the initial bar fairly high — betting that he could retrieve 1,000 pieces of single-use plastic containers by Memorial Day. His picking trips became a steady routine, once or twice a week, and he posted pictures of each day's ugly haul on his Instagram account. He hit the 1,000 mark with a few days to spare.

Energized by hitting that goal and by the Instagram feedback, he has continued his personal campaign, plucking plastics on both sides of an 8-mile stretch of river. A shy person, he took to social media in an effort to mobilize other plastic "pickers" and to raise awareness of the constant scourge of plastics fouling their river.

His efforts have taken on new import with the recent research showing that plastics don't go away: They break down into tiny particles called microplastics that get into our food, bodies and water. Studies show that microplastics harm fish, water quality and human health.

Naylor's hope is that, with consumer pressure, manufacturers will acknowledge the environmental harm and stop bottling water and beverages in plastic, using glass and aluminum instead, which are eminently more recyclable. He also wants consumers to do their part by buying glass bottles or aluminum cans and shopping with reusable bags. Restaurants can contribute, too, he said, by using recyclable to-go containers and only giving plastic straws to patrons who ask for them.

Many who can't comb the river themselves live vicariously through Naylor and praise his dedication. He gets comments from all over the world. "Thank you for taking care of your place in the world," said one Instagram follower. "Frankly," another wrote, "I wish every river had people like you who give a damn."

Among those inspired by Naylor is Phil Wenger, president and CEO of the Lancaster Conservancy, who met Naylor while he was

gathering trash in front of Wenger's river home. "He's a dynamo and talks constantly about his passion, but he backs it up with equally hard, tiring dirty work," Wenger said. "River trash seems never-ending. But John inspired those of us who live along the river that if we all do our part, eventually we can clean up the Susquehanna's banks."

Naylor accepts no money for his efforts, instead urging donations to the Lower Susquehanna Riverkeeper Association, which hosts river cleanups. He transports his canoe on a dented pickup truck he bought 29 years ago that now has 280,000 miles on it. Recently, to increase his cargo space on the water, he upgraded, as it were, to a similarly banged-up jonboat.

The trash he collects goes to a dumpster paid for by the Lower Susquehanna Riverkeeper Association. The waste is burned in a nearby incinerator that produces electricity.

"In short, I give a damn," Naylor said. "I want the Chesapeake Bay people downstream to know some of us do care and are making an effort to improve the Bay's and the ocean's water quality." ■

To keep tabs on Naylor and his efforts and ample photos, visit his Instagram account, @Susquehanna_Plastic_Pickn_1000.

A tussle over a MD trout stream — with no trout in it

Plan to restore stretch of Jabez Branch pits anglers against state

By Timothy B. Wheeler

By all accounts, Jabez Branch needs help. How to help it, though, has triggered a fierce debate, pitting those who want to help it for the sake of the Chesapeake Bay against defenders of native trout habitat, who worry that what's planned could come at the expense of the region's most prized freshwater fish. A fish that is also officially targeted for help under the 2014 Bay restoration agreement.

A tributary of the Severn River in Maryland, Jabez Branch is the only stream in the state's portion of the Coastal Plain that is — or maybe was — home to brook trout.

Unlike the nonnative and more adaptable brown trout, brook trout — or “brookies,” as they're fondly known by sports anglers — are typically found in clear, cold streams and rivers in the Piedmont or higher elevation headwaters of the Bay watershed. Downstream, in the Coastal Plain, the water gets too hot in the summer for brook trout to survive. Jabez Branch, however, has been an anomaly, with cool springs feeding it and the shade-casting boughs of forest along much of its banks.

But trout have been struggling to hold on there since the late 1980s, when stormwater runoff began pouring in from the surfaces of new highways and suburban development. The surges have warmed the water, making it tougher for brookies to survive. The pulses also have poured sediment and nutrients downstream, adding to water quality woes in the Severn River and the Bay.

The state Department of Natural Resources and the Severn Riverkeeper have applied for permits to restore a degraded half-mile stretch of one of Jabez Branch's tributaries that is crossed by Interstate 97 and a pair of other roads.

Sara Caldes, the Severn Riverkeeper, called it a “completely broken” stream reach. “The banks are eroding, the wetlands are drying out, the ecosystem is dying,” she said. The plan, proponents say, is to raise the deeply incised stream channel and slow the flow down by spreading it out, reconnecting it with its floodplain and creating wetlands along its banks.

And, they stress, the DNR has never



A tributary of Jabez Branch in Anne Arundel County, MD, shows signs of degradation: eroding banks and an incised stream bed covered with silt. (Dave Harp)

found brook trout in that tributary of Jabez Branch, despite repeatedly sampling it by electrofishing — a process that briefly stuns fish and brings them to the surface for easy counting before they recover and swim away.

But Art Senkel, conservation chair of the Patapsco Valley branch of Trout Unlimited, said that the DNR's surveys have missed notoriously reclusive brook trout before. The only way to be sure, he insists, is to sample the stream for traces of trout DNA, which the DNR has not done.

If the proposed restoration project goes through as planned, he contends, it would cut off coldwater springs and remove shade trees, warming the stream to the point that brook trout couldn't live there. Even if they aren't there now, Senkel argues, that doesn't mean they can't be brought back if the stream is properly restored.

Trout in Jabez Branch

First discovered in Jabez Branch in 1977, brookies have been fighting for survival

there ever since, as highway construction cut through the watershed in the 1970s and '80s, followed by residential and commercial development. Brook trout require clear, cold water no warmer than 68 degrees Fahrenheit year-round; they are rarely found in any area with even a little development.

Electrofishing surveys in 1986 found a few dozen brook trout overall in two of the three main tributaries of the stream and in its upper mainstem, which were somewhat less impacted by highway construction. “Tributary 3,” as the stretch targeted for restoration is known, had none. About 16% of that tributary's watershed is blanketed by pavement and buildings; brook trout aren't generally found in any stream with 5% or more of its uplands covered by impervious surfaces.

A year later, biologists found far fewer trout. Looking for a reason, they found that a runoff retention basin installed along I-97 was piping naturally solar-heated water into the stream. The State Highway

Administration plugged it, but it turned out that wasn't the only source of thermal pollution. Further investigation showed stream temperatures spiking by up to 10 degrees in other places immediately after summer rainstorms.

By 1990, the DNR couldn't find trout anywhere in Jabez Branch. Biologists subsequently restocked it with wild brook trout from other Maryland streams, and the fish seemed to do well for a time. In 1997, the headwaters of a different tributary underwent restoration to shore up eroding banks and reduce sediment pollution downstream. The DNR also acquired and protected about 1,700 forested acres in the Severn Run watershed, of which Jabez Branch is a part.

But conditions continued trending downward. In 2013, the Severn River Commission contended that sediment washing down from Jabez Branch was creating navigation problems in the upper river. The SHA commissioned a study of the stream in 2015, which recommended a series of projects to

reduce runoff and restore various segments of the stream. The project being debated now grew out of that study.

Dispute over methodology

To an extent, the dispute over restoring this stretch of Jabez Branch is about restoration methodology. The DNR and Severn Riverkeeper are backing a proposal by an Annapolis-based environmental consulting firm to create a “regenerative stream conveyance.”

The plan is to fill the incised channel — 8 feet deep or more in one place — with sand, gravel and wood chips to reconnect it with its floodplain. A series of riffles and pools would be created in the channel to slow the flow and help it handle big storms. The existing 2.6 acres of wetlands bordering the stream would be enhanced and doubled in size.

But Senkel of Trout Unlimited objected to the plan in an October letter to the DNR and to the Maryland Department of the Environment, which must decide whether to permit the project. He contended that the project could create a barrier to brook trout, altering the flow of cold water from springs into that stretch and killing off some of the streamside trees shading it.

If that happens, he said, the DNR would be violating the Clean Water Act, which prohibits allowing the degradation of a stream — in this case one designated by the state as habitat for coldwater species such as trout.

Trout Unlimited favors what’s called “natural channel design,” a method first developed for restoring coldwater streams in the Rocky Mountains. It, too, would raise the incised stream bed to reconnect with floodplains, but it would attempt to reduce erosion by introducing meanders into the channel, armoring the banks with stone and tree trunks.

There have been several regenerative stream

projects undertaken in Anne Arundel County, and proponents say they have not only been successful at reducing sediment and nutrient pollution but have also improved habitat for frogs, fish and other aquatic creatures.

But Senkel counters that regenerative stream projects have never been used in this region to restore trout habitat, while natural channel design has been repeatedly undertaken in Piedmont streams.

“It’s a freak. It’s unique,” Senkel said of Jabez Branch as a Coastal Plain trout stream. “To go ahead and design a system that stands any reasonable chance of endangering that ... is to me perplexing. There’s no way back once you’ve done that.”

The source of the problem

Arguments over technique aside, Senkel contends that no restoration should take place until more is done to address the cause of erosion and rising temperatures. The SHA consultant’s report in 2015 identified 96 stormwater management projects to curtail runoff into the stream. Among them were new or expanded detention ponds, tree plantings and grassy swales to soak up rainfall. The consultant recommended doing those either before or in concert with stream restoration projects.

It’s unclear exactly how many of those have been done. SHA spokesperson Shantee Felix said the agency looked at 32 of the proposed runoff control projects that were in highway rights of way but concluded most were not feasible because of other potential environmental impacts. The highway agency did plant trees, retrofit a stormwater pond and create grassy swales to treat runoff from a total of 60 acres of pavement in the watershed, she said. Anne Arundel County also has completed a couple of stormwater projects in the watershed and is planning more, said Erik Michelsen, deputy public



Art Senkel of Trout Unlimited inspects a Jabez Branch tributary where a stream restoration project has been proposed. (Dave Harp)

works director for watershed protection and restoration.

Project proponents say the stream needs restoring regardless of how much runoff can be reduced. They contend that bank erosion will continue even if the flashy flow is reduced. Michelsen, who supports the planned restoration, said he wouldn’t expect brook trout back in that tributary anytime soon, but he believes it “opens the door” to creating habitat suitable for their eventual return.

Bill Anderson, assistant DNR secretary, said habitat improvement is secondary — the chief goal of the restoration, he stressed, is to reduce the flow of nutrients and sediment to the Severn River and the Bay. He said DNR officials believe the proposed project is the best option for handling projected increases in runoff, given the development that is continuing there. Construction was under way last fall on new homes in a subdivision called the Preserve at Severn Run, which is being carved out of woods in the headwaters of two Jabez tributaries where trout had been hanging on.

“Based on the rising temperatures of the water, we believe no matter what is done in Jabez [Tributary 3] that the chances of trout coming back are very, very low, no matter what you do,” Anderson said. “It’s not an achievable result.”

Indeed, he said, water temperatures have

been trending upward lately throughout the rest of Jabez Branch. DNR biologists have been unable for the last two years to find brook trout anywhere in the stream complex. Anderson called their disappearance “disturbing” and said the future of brook trout in the rest of Jabez is “getting a little sketchy.”

In that regard, for all of its uniqueness, Jabez Branch is facing the same fate as many of Maryland’s other trout streams. Although the 2014 *Chesapeake Bay Watershed Agreement* calls for increasing occupied brook trout habitat 8% by 2025, Maryland’s populations of the fish are headed in the other direction. A statewide survey from 2014 to 2018 found they had vanished from 27% of the stream catchments they had historically occupied. The decline since 1987 was greatest, 49%, in densely developed central Maryland.

Biologists say rising temperatures associated with climate change pose an existential threat to brook trout populations in many areas, but Senkel said the fish could be gone from central Maryland before climate change could get them.

“Where there’s development pressure,” he said, “brook trout seem to lose all the time. We’ve been losing these streams since the ‘90s and we’re still losing them. At some point we have to say ‘wait a minute.’” ■



A thermometer is used to check the temperature of Jabez Branch. Runoff from highways and development after summer rainstorms has warmed the water to levels intolerable for brook trout. (Dave Harp)

Bright VA high school students tackle solar energy challenge

Throwing Solar Shade inspires new generation of citizen scientists

By Tamara Dietrich

Growing threats to the environment — from warming temperatures to melting icecaps, rising seas to more intense storms and floods — have increased calls to grow a green workforce that can figure out how to face a brave new normal.

To that end, educators and innovators in Virginia devised a 10-week high school competition that enlisted bright young minds to propose innovations in solar energy.

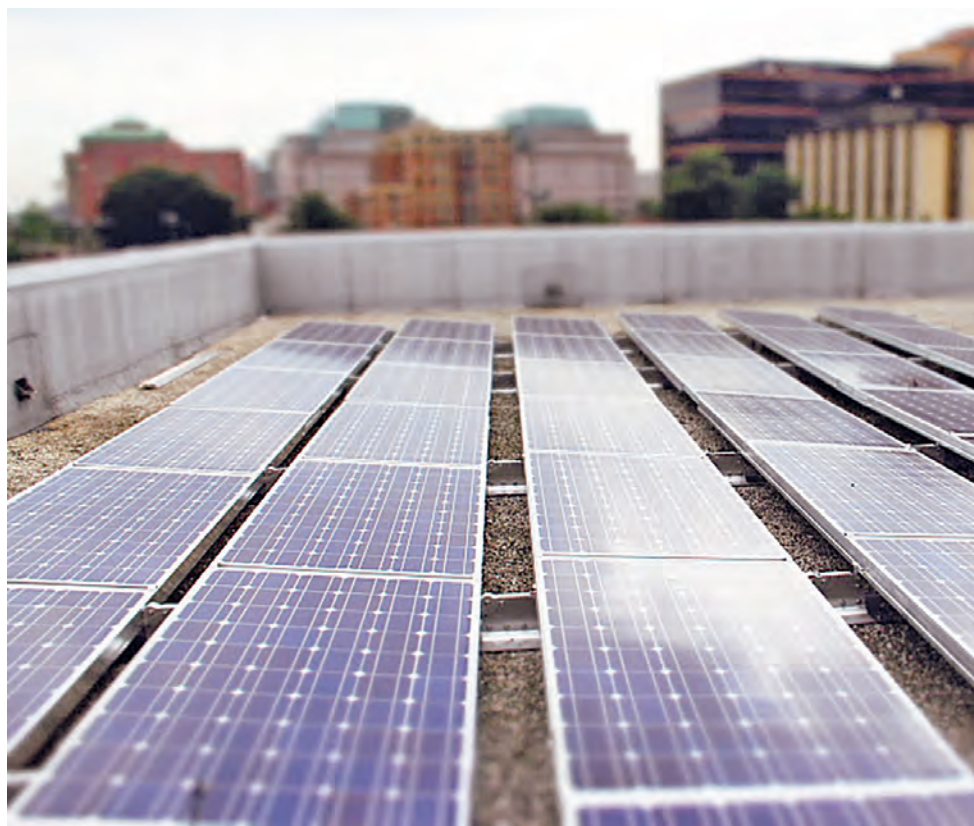
The Throwing Solar Shade contest invited students from one urban and one rural school district to look to their own communities for inspiration. Three schools participated and produced about 15 student projects. The four winning entries studied the effectiveness of different solar panel surfaces, the use of light-hued paint to reduce asphalt temperatures, the physics of solar panels and the merits of placing solar panels atop commercial poultry houses.

“This particular program is about growing the next generation of citizen-scientists,” program organizer Anthony Smith said. “It’s also about engaging — particularly in this case — high school students in not only learning about climate change and solar, but also developing the five Cs: critical thinking, creativity, collaboration, communication and citizenship skills.”

Smith is founder of Secure Futures, a Staunton-based solar power developer that partnered on the project with the Science Museum of Virginia. Other partners are the Augusta County and Richmond public school systems, Virginia Commonwealth University and the National Energy Education Development (NEED) project.

Throwing Solar Shade got the attention of the U.S. Department of Energy’s Solar Decathlon collegiate competition, which since 2002 has challenged college teams to design and build innovative structures powered by renewable energy. The Solar Decathlon organizers invited the Virginia students to present their winning projects last July at a conference on the National Mall in Washington, DC.

But COVID-19 restrictions forced the students make their presentation virtually in December during a national webinar for the Solar Student Leaders of Tomorrow



Solar panels generate energy from the roof of the Arlington (VA) Central Library. (Arlington Department of Environmental Services)

Showcase. The presentation was recorded and posted to YouTube.

“These are some smart kids,” said Jeremy Hoffman, chief scientist at the Science Museum of Virginia. “What I think is amazing is these kids took the initiative to explore these topics. They all kind of developed their own angle, because we left it open-ended. These students ran with it.”

Students at the Open High School in downtown Richmond, a small alternative public school with an independent-study model, noted the inequities of extreme urban heat, he said.

“[They addressed] how climate change disproportionately impacts those ‘without,’” Hoffman said. “And they were looking into patterns of this inequity and how to solve it. Becoming involved in putting others ahead of yourself and using science to help inform those decisions was just a powerful thing to witness.”

Caroline Miller, a senior at both Fort Defiance High School and Shenandoah Valley Governor’s School in Augusta County, experimented with octagonal, pyramidal, semicircular and flat surfaces to determine if “textured” surfaces on solar panels could maximize efficiency and generate more heat. She found that they could.

“I began ... with minimal interest in

solar technology, but now it’s central to my future,” Miller said in her presentation. “I wanted to become a scientist that works with anything biology-related for as long as I can remember, but I didn’t realize that could have anything to do with solar technology. Currently, I hope to study bioengineering in college and use my education to work towards improving solar cells.”

Sherylynne Crookshanks, a junior at Fort Defiance High School, looked at ways to reduce her school’s impact as a “heat island” — an area that is hotter than the surrounding area.

“Being from a rural area,” Crookshanks said, “I was curious about heat islands in my community. I didn’t have to look too far because parking lots pose one of the greatest heat islands of our modern world.”

For her project, she measured how various paint colors affect the temperature of asphalt. White is well-known to be cooler because it reflects the sun’s rays, while black is hotter because it absorbs them.

Because students at her school can pay a small fee to paint their own parking spaces in a range of colors as a fundraiser for the art department, Crookshanks was able to study and rank the heat differentials of various paint colors. She then calculated the range of costs and the pros and cons of repaving or repainting the school’s 142,000-square-foot

parking lot.

Jack Salgado, a senior at Open High School, studied the physics of solar panels, focusing on “band gaps.” A band gap is the difference in energy between the valence band, or outermost shell of an electron, and the conduction band, or the free flow of electrons between atoms. Direct band-gap materials are more energy efficient, but they’re more rare and more expensive. That’s why about 95% of solar panels use less efficient indirect band-gap materials, typically silicon, which is much cheaper.

“If we want to power our homes and materials with [more efficient] materials, then engineers and scientists will have to push the technology further,” Salgado said. “I’d love to help.”

Lauren Rhodes is a senior at Fort Defiance High School and member of Future Farmers of America. She’s part of a long line of commercial poultry farmers, and she studied the merits of installing solar panels on the roofs of turkey houses.

She learned that there’s no easy answer. While grants, loans and tax incentives exist to help install costly panels, and the solar conversion would pay for itself over time, farmers still have to cover hefty upfront costs.

She also studied issues with the structural integrity of old and new poultry house roofs and whether they could withstand the added weight of solar panels.

“I found that, upfront, solar is a very costly investment, especially for family farmers who are already in a risky business,” Rhodes said.

For their achievement, the four students were granted internships with Secure Futures.

A third-party evaluation has shown that students who took part in the contest showed a “very, very significant” increase in science, math and engineering skills, Smith said, “and the superintendents of both school systems were just raving about the impact.”

“The brightest spots in feedback from students,” Hoffman said, “was the idea of developing their identity as a scientist.”

“Many students didn’t see themselves as particularly good at science before this. They didn’t find the application of science to be extremely relevant to their lives. And, after this, they spoke very highly about how they could use scientific principles to improve their community.” ■

In South Baltimore, a young environmentalist rises

Naturalist society names Carlos Sanchez-Gonzalez Environmental Champion

By Jeremy Cox

He wants to shut down a trash incinerator, reduce his city's waste to zero, increase the amount of affordable housing and get abandoned mattresses and old furniture off the streets.

Carlos Sanchez-Gonzalez, a 16-year-old high school sophomore from South Baltimore, doesn't just aspire to these things. He already has results.

As a prominent member of Free Your Voice, a youth advocacy group focused on environmental justice, Sanchez-Gonzalez helped to persuade the Baltimore City Council last year to put the city on a path toward generating near-zero waste by 2040. The plan calls for the eventual closure of the Wheelabrator trash incinerator, a major source of air pollution near his home.

And, as a youth leader for the South Baltimore Community Land Trust, he has helped to build support for a program that is transforming several derelict properties into affordable, environmentally friendly housing.

For his efforts, Sanchez-Gonzalez was honored as a Youth Environmental Champion during the Naturally Latinos conference in December. The event is hosted by the Audubon Naturalist Society, a longstanding environmental group in the Washington, DC, region.

"A bunch of people told me the work I was doing was important, but I never really thought about it until I won the award," he said.

Below are excerpts from an interview with Sanchez-Gonzalez, edited for length and clarity.

How did you get interested in environmental advocacy?

When I was younger, my parents couldn't work, and things started going downhill. I remember seeing in front of me literally a bunch of envelopes of things they'd have to pay. I thought, "I really want to help," so I started looking at different ways [to make money]. Then I got introduced to [a job opportunity through] Free Your Voice by my brother and to the Zero Waste initiative. When I was born, I had asthma, and I wasn't sure why. Now that I've been working with them, it connects the dots.



Carlos Sanchez-Gonzalez visits a neighborhood park that he helped to build in the Curtis Bay area of Baltimore through the Baltimore Community Land Trust. Sanchez-Gonzalez was the 2020 recipient of the Youth Environmental Champion award from the Audubon Naturalist Society. (Dave Harp)

What was your role in promoting the "zero waste" plan?

The plan was developed a little bit before I joined. I spoke at many council meetings about the plan. I helped with pushing the plan forward and making sure it got implemented correctly.

So, going downtown, putting on a tie?

[Laughs] Most of the time I would be dressed casual because I'd just be coming out of school.

Was that intimidating, to be a young person and speak before the most important body in the city?

I was really scared of messing up. But at the same time, I realized there were people there to support me, and they were helping me along the way. I didn't feel I was really capable of doing this kind of change. It really helps knowing that what we're doing is not just going to benefit one or 10 people. It's going to benefit many people.

Why does "zero waste" matter to you?

I live in the Lakeland community, and I see a bunch of trash and plastic bottles, especially in the alleys. I know friends and family who have asthma and lung cancer.

Just knowing that there is a way to prevent this or bring down the number of people who have lung cancer or asthma motivates me to keep going.

Is it about closing the Wheelabrator plant or is there more than that?

It's not just about bringing down that incinerator. It's making sure that the city and other places stop relying on burning and burying trash and understand there are other alternatives for our waste.

Like what?

Something that really sounds promising to me is having more markets for things to be picked up and recycled. Currently, we don't have a recycling facility for mattresses and furniture. The only options are leaving it outside or throwing it into a dumping ground. We need to create policies and infrastructure for these things to be recycled.

Justice and equity seem to be a common thread in your efforts. Why is that?

The reality we live in is that people in low-income communities get looked down upon. Wealthy people make the decisions, and that isn't right. For example, the Wheelabrator incinerator was put in the center of South Baltimore without community residents

having a say in that decision. It was just placed there, and we're the ones who end up having to pay with our lives. It costs \$55 million in health damages every year [according to a 2017 study commissioned by the Chesapeake Bay Foundation].

How has the pandemic affected your work?

It's been kind of difficult. We're not really working at it as much because of COVID. There's Zoom, but to what extent? When the internet is not working, it starts messing up.

How do you juggle your environmental work with schoolwork, household chores and having a life?

Free Your Voice has a partnership with the school. When it comes to learning, my team is really understanding. It's not something like, "Oh, you have to be here." If you're struggling, you can communicate with them. You've got to work on yourself sometimes. As of right now, I've got 30, 40 minutes in between what I may be doing on that day. So, during that time I try to do as much classwork as I can.

What kind of work do you want to do after you graduate?

I haven't really thought about it. I really find development to be important. Something I really want to do is join the Marines for two years. I've also been looking into real estate wholesaling and becoming an entrepreneur. That would help me continue this project we're working on [with affordable housing and Zero Waste].

Does your Hispanic heritage influence you as an environmentalist? If so, how?

I see that race could possibly be a reason, but there are definitely other reasons. This is not just me who goes through this [being affected by environmental degradation]. It's a problem that affects everybody.

Do you worry that environmental issues take a backseat for many people?

It is true. There are many other problems out there that people find more important than others. But this is what sticks with me: If we can't take care of our planet, what keeps us alive, how will we be able to fix anything else? ■



Orange water, dirty air

Billions have been spent to clean up abandoned mine land but streams, towns, landscape still suffer

By Ad Crable

This is the first article in a two-part series on the dramatic and lasting impact of unregulated coal mining that once took place in the Chesapeake Bay watershed. For nearly 200 years, coal from Pennsylvania and Maryland mines helped power the nation but left a legacy of polluted streams, coal waste piles and other problems.

The effort to heal scarred landscapes and tainted water began just 40 years ago and has a long way to go. But funding to restore abandoned mine land is largely tied to existing coal mining operations. In an odd twist, we need coal in order to clean up coal. As the nation moves away from coal-generated energy, what will fund the work that lies ahead?

Part 1 offers a look at how we got here. Part 2, coming in April, will explore restoration strategies, success stories and what it will take to get the job done.

In dozens of old coal mining towns in Pennsylvania and Western Maryland, black dust swirling off of naked piles of coal waste — called “bony piles” — forces people to hose off their houses and breathe polluted air. It’s been that way for so long that many people did not expect anything to change.

“Government did not have the resources to clean up the bony piles, and a lot of us thought they would be permanent parts of our communities,” said Andy McAllister, executive director of the Western Pennsylvania Coalition for Abandoned Mine Reclamation.

Sharing the landscape are thousands of miles of brightly colored streams infused with acid mine drainage, where you don’t go swimming without coming out orange or red. “Back when I was a kid, you wouldn’t

even want to wade in it, not if you wanted to keep your shoes,” recalled an elderly Garrett County, MD, resident.

That is the legacy of unfettered coal mining in a significant chunk of the Bay drainage basin. West Virginia and Virginia have abandoned coal mining issues, too, but few are located in the Bay watershed.

Officials say considerable progress has been made toward erasing the environmental, safety and aesthetic problems from abandoned mine land in the Pennsylvania and Maryland since cleanup began more than 40 years ago.

Together, the two states, federal government, groups and coal companies have laboriously removed those scars from more than 94,000 acres, largely through \$1.6 billion in aid from fees placed on each ton of coal mined in the United States. Officials from the states say many of the very worst threats have been tackled.

Still, 1,794 miles of streams in Pennsylvania that drain into the Chesapeake Bay have the pH of vinegar and are lifeless, devoid of the fish and aquatic insects that build a healthy ecosystem.

In Western Maryland, an estimated 127 miles of otherwise high-quality streams are polluted by abandoned acid mine drainage.

The remaining workload is huge, and the future of its major funding stream — the Abandoned Mine Land Fund — is threatened. That federal initiative, which has funded the bulk of the cleanup since 1977, faces expiration later this year, and reauthorization by Congress is not certain. Even if renewed, the fee placed on each ton of coal for cleanups could be reduced to aid the faltering coal industry.

Whether the federal program continues, the use of coal in the United States continues to decline. That means less money being paid into the mandatory fund. It also means that more coal companies may go bankrupt, forfeiting environmental bonds or finding themselves unable to remediate abandoned mine land when they re-mine old sites with mechanized equipment.

Still a threat

Pennsylvania has the most abandoned mine land in the nation and about one-third of all such land in the United States. Statewide, there are as many as 300,000 acres of abandoned coal lands, pocked with

Photo: Acid mine discharge, as shown here in central Pennsylvania, still colors and makes lifeless approximately 2,000 miles of Pennsylvania streams and 147 miles of Maryland streams that flow toward the Chesapeake Bay. (PA Department of Environmental Protection)

waste piles, mine shafts and unreclaimed surface mine land in 45 of Pennsylvania's 67 counties. More than 800 piles of coal waste surround coal towns, devoid of vegetation, blowing a pesky black film on buildings and polluting the air and local streams.

In Pennsylvania, acid mine drainage is just behind agriculture runoff as the top source of water pollution.

Acid mine drainage is usually formed when pyrite, a molecule of iron, and sulfur, commonly found in coal, combine with oxygen and water to produce sulfuric acid, leaving a yellow or red precipitate on streambed rocks. Sometimes aluminum dominates, and waters may begin clear but are equally toxic. In all, approximately 26 kinds of heavy metals can be released.

The drainage flows from open mines and from "blowouts" from thousands of miles of sealed mine tunnels.

Each year, Pennsylvania's Bureau of Abandoned Mine Reclamation has to come to the rescue of people whose homes have listed into caved-in mines. And each year, the agency has to build new water sources for homeowners or communities whose drinking water becomes tainted by acid mine drainage. Of the bureau's 127 reclamation projects in 2020, 54 were classified as emergencies.

For larger communities, acid mine drainage drives up the cost of water treatment.

In two western Pennsylvania counties studied between 2013 and 2017, underground mining caused streambeds to

fracture and drain water 60 times on 46 streams. The beds were grouted or lined with plastic as temporary fixes.

The Bureau of Abandoned Mine Reclamation estimates it would take \$15 billion and 105 years at the current rate to clean up the abandoned mine sites statewide. That includes 840 coal waste piles and 5,500 miles of streams rendered lifeless by acid mine drainage, as well as safety issues such as open mine shafts, exposed highwalls, mine portals and landslides. Two thousand miles of those polluted streams drain into the Chesapeake Bay.

Pennsylvania also has about 40 active mine fires, where coal seams burn underground. Of the \$65 million budget to address abandoned mine land in the state in 2020, \$16.5 million went to extinguishing a 14-year-old underground mine fire that was causing local pollution problems.

The most infamous and eerie example of smoldering coal mines is in Centralia, where an underground fire, burning since 1962, has slowly emptied a borough of more than 1,000 people down to five homes. All of the other homes were bulldozed.

The Pennsylvania Fish and Boat Commission says there are 5,166 miles of streams that cannot support fish because of acid mine drainage. If healthy, many of them could support robust trout populations. The agency put a price tag on that lost recreational value: \$29 million a year.

Maryland's Abandoned Mine Land Program says there are \$59 million worth of

reclamation projects outstanding. Maryland's legacy mine land problems are similar to Pennsylvania's but on a smaller scale. No official figure is available, but there may be approximately 5,000 acres remaining to be cleaned up.

Acid mine damage & the Bay

Do the acidic water and heavy metals flushing from abandoned mines in Pennsylvania and Maryland harm the Chesapeake Bay?

Certainly, vast dilution takes place as the water flows downstream, and some officials say that insulates the Bay from any deleterious effect.

The state-federal Chesapeake Bay Program, which leads the Bay restoration effort, has said that "the buffering capacity of the region is sufficient to neutralize all of the acid from acid mine drainage." But more studies need to be done, it says, "to evaluate transport of metals to the Bay itself."

Other scientists have some concerns about downstream impacts.

"Impacts of acid mine drainage on stream ecosystem function ... cascade to downstream reaches, impacting function there and perhaps even in receiving estuaries, in our case, the Chesapeake and Delaware bays," concluded a 2012 study by the Stroud Water Research Center and two universities.

"The alteration of function in thousands of kilometers of acid mine drainage-impacted streams in Pennsylvania suggests that remediation of acid mine drainage-impacted reaches may be just as critical as other pollution mitigation strategies that are implemented to improve water quality in large rivers and estuaries."

Several studies have found that the heavy metals produced in acid mine drainage actually remove harmful phosphorus nutrients. But later, sediment containing the nutrient may move downstream.

Moreover, contends John Dawes of the Foundation for Pennsylvania Watersheds, "I would argue that if those 2,000 miles [of acid mine-damaged streams] in the Bay watershed were fully functional and processing nitrogen, I think it could have a measurable impact on the Bay."

Richard Eskin, director of Maryland's science services administration in the Department of the Environment, sees it this way: "Acid mine drainage isn't a significant concern for the Bay, but it's not something we should ignore either, not if we want to talk honestly about fixing watersheds."

A mining history

The first reports of coal mining in Pennsylvania go back to the 1700s, when a



Coal waste escaping from a refuse pile in north-eastern Pennsylvania chokes a creek. The source of the pollution has since been cleaned up. (PA Bureau of Abandoned Mine Reclamation)

fledgling iron industry took hold. One of the earliest coal extractions during the Colonial period was collected from a Pittsburgh coal seam and transported by canoe to a military fort.

By the mid-1800s, coal replaced the use of wood in factories that produced steel, locomotives, railroad lines and ships, as well as for heating homes. Coal powered the steel that helped win both World Wars.

The state became the nation's top producer of coal, both anthracite and bituminous, until the 1930s when it was passed by West Virginia. Production peaked in 1918, when 277 million tons of coal were hauled out of 2,851 underground mines.

In contrast, there are currently 211 coal mines in the state, 113 of them in the Bay watershed. Most are surface mines. Underground mines are mostly mechanized.

The industry was wracked by violence in the 1920s as exploited miners sought to organize. The 1920s also marked the decline of peak coal in the state resulting from overproduction and shrinking markets.

Use of coal shifted from the steel industry to fueling electricity. But that, too, is in decline in the face of cheaper natural gas, along with concerns about global warming and impacts on human health from coal-fired power plants.

See **MINE LAND**, page 18



A mountain of waste coal stands at the edge of a coal-company town in western Pennsylvania. (Western PA Coalition for Abandoned Mine Reclamation)

Pennsylvania has slipped to third in the nation in coal production, behind Wyoming and West Virginia and is barely ahead of Illinois. Both nuclear power and natural gas supply more electricity in the state than coal.

One of the most infamous mining accidents in Pennsylvania was the Knox Mine disaster in 1959. Operating illegally, a coal company mined an underground vein of coal within 19 inches of the surface of the Susquehanna River.

The roof collapsed and a whirlpool formed as the river flooded the network of mines. Twelve miners died, and their bodies were never recovered. Sand, concrete and even train boxcars were poured into the gaping hole over several weeks to stem the drain.

The accident caused mining laws to be reformed in Pennsylvania and essentially ended underground mining for anthracite coal in the state.

Western Maryland's underground coal mines also date from the 1700s. Later, use of the Chesapeake and Ohio Canal and the Baltimore and Ohio Railroad allowed access to markets at home and abroad.

Maryland coal mining peaked in the early 1900s, with 450 mines in operation. Today, there are 48 active coal mines, all but four of them surface mines. All but two are located in the Chesapeake Bay drainage basin. Coal drives 37% of all electricity produced in Maryland.

Because mines were often located in rural areas, coal companies built entire towns. Many have disappeared completely.

The mining workforce often was composed of immigrant laborers. It was dangerous work. From 1877 to 1940, 18,000 men and boys died in mines in Pennsylvania from accidents. Untold numbers died later

from the insidious black lung disease, caused by inhaling coal dust.

First regulations

Being the economic force that they were, coal mines were not regulated against environmental damage. It was typical for coal companies, both large and small, to mine an area, then move on, leaving buildings, leaking mine shafts, polluted water and scarred lands behind — until 1977, when Congress passed the Surface Mining, Reclamation and Control Act.

Vetoed twice and resisted for years, the law was pushed into action by public outcry and driven in large part by the vast abandoned mine land in Pennsylvania. The legislation brought control over coal mining by the federal government. It required all mining companies going forward to better protect the environment and restore land to beneficial use when mining ceased.

But its most ambitious initiative was to start cleaning up the long-festering legacy of abandoned mine land. All states had to inventory abandoned mine land and develop reclamation plans. To fund cleanups, a reclamation fee, placed on each ton of extracted coal mined, was placed in a trust fund.

The money was distributed to states, based on the amount of abandoned mine land, with an emphasis on correcting threats to public health and safety. Cleaning up the environment was initially a lower priority, but a change in the law in 1996 allows more to be spent on addressing acid mine drainage.

In 2016, Congress added a taxpayer-funded program, the Abandoned Mine Land Pilot Program, which allows for cleanups that help return mine land to productive uses to help the economies of coal communities.

Between the two funds, Pennsylvania has received \$1.5 billion to date. Maryland,



Shamokin Creek flows orange from the effects of acid mine drainage in Shamokin, PA, in September 2019. (Will Parson/Chesapeake Bay Program)

which doesn't qualify for the pilot funds and gets the minimum of trust funds, has gotten about \$84 million.

The cleanup money has been used for a wide variety of projects.

The Maryland Bureau of Mines reports that it has overseen more than 300 projects, cleaned up 2,400 acres of abandoned mine land, removed 14 miles of dangerous highwalls, restored or improved 115 miles of streams, sealed more than 100 mine portals, stabilized 27 landslides, provided drinkable water to 128 homes and stabilized miles of roads and listing buildings, including some on the campus of Frostburg State University.

A bureau spokesman said all of the high-priority abandoned mine problems have been addressed in Western Maryland, either with federal trust fund money or by coal companies re-mining old sites.

Pennsylvania has remediated 76,000 acres. Projects have tackled clogged streams, dangerous highwalls, landslides, mine openings, coal waste piles, underground mine fires and subsidence issues. Although it is not considered a human health priority, acid mine drainage is increasingly being treated to clean up the dead and colorized streams around the state.

In both states, projects intended to extract the orange hue and return life to streams generally treat the symptoms rather than the cause, using systems that must be run and maintained with no end in sight. Active treatment systems are like mini wastewater

plants, taking in contaminated water and releasing it in better condition. Passive systems range from neutralizing the acidic water with injections of lime to the creation of wetlands that use mushroom compost to create bacteria that captures heavy metals.

There are more than 300 active and passive treatment systems in Pennsylvania and 60 in Maryland coal country, cleansing many streams that flow toward the Chesapeake Bay.

Meanwhile, a private initiative to burn old coal waste piles to generate electricity has substantially boosted the cleanup effort in Pennsylvania. There are 10 such plants in the state. They treat the coal before burning it to reduce air pollution.

According to the Anthracite Region Independent Power Producers Association, the effort to date has removed 225 million tons of refuse, restored 1,200 miles of streams and reclaimed 7,200 acres of land.

"These plants have played a crucial role in cleaning up and restoring many of the hundreds of abandoned coal waste piles," said Dawes of the Foundation for Pennsylvania Watersheds. Coal waste piles are not considered high priority under federal reclamation rules and would not have gotten funding for cleanup, he said.

The plants "are truly life altering for the communities where they are located," said Jerrod Givens of the Appalachian Region Independent Power Producers Association. ■



Bituminous coal miners pose for a photo in western Pennsylvania during the boom times. (PA Dept. of Environmental Protection)

MD lawmakers act on statewide balloon release ban

House passes bill that would protect shorebirds, sea turtles

By Timothy B. Wheeler

Democrats and Republicans don't agree on much these days but, in the Maryland General Assembly, lawmakers of both parties have come together to protect sea turtles, shorebirds and other wildlife.

With bipartisan support, the House of Delegates overwhelmingly passed a measure that would impose a statewide ban on intentional releases of helium-filled balloons. A violation would be punishable by a fine of up to \$250.

Backers say the legislation, HB391, is needed because what goes up eventually comes down, where it poses a pernicious threat to animals, particularly marine life.

"When a balloon is released, best case, it becomes litter. Oftentimes it's much worse," said the bill's lead sponsor, Del. Wayne Hartman, a Republican representing Wicomico and Worcester counties on the Eastern Shore. "Unfortunately, [balloons] are often confused as food for sea life," he said, "and the ribbons and so forth attached can cause entanglement." The outcome for marine life is often fatal, he pointed out.

Helium-filled latex balloons can drift for miles before coming to Earth — or, just as likely, to water. Helium-filled foil balloons (commonly known by the tradename Mylar) remain buoyant much longer and can stay aloft for weeks and drift for hundreds of miles, Hartman explained during a Jan. 15 hearing before the House Environment and Transportation Committee.

A recent survey by the nonprofit group Oceana tallied nearly 1,800 reports nationwide of 40 different species of animals either swallowing or becoming entangled in some type of plastic. Balloons were among the most frequent plastic items involved. Nearly half of the incidents involved sea turtles, and close to 90% of all the affected animals were either endangered or threatened species, Oceana reported.

In Maryland, Hartman recalled, a "roundup" organized by a family from



This partially decomposed sea turtle was found washed ashore at Fisherman Island National Wildlife Refuge at the mouth of the Chesapeake Bay. A necropsy on the animal found two latex balloons in its digestive tract. (U.S. Fish and Wildlife Service)

Berlin collected more than 2,800 balloons in 19 months from the ocean and beaches. One youngster found 20 balloons in a single day on Assateague Island.

The bill — co-sponsored by two other Eastern Shore Republicans and four Western Shore Democrats — has drawn enthusiastic support from a bevy of environmental and animal-welfare groups. The House vote Feb. 16 was 94–34. Senate action was pending when the *Bay Journal* went to press. Similar bills passed each chamber last year but

died in a pandemic-shortened session

Three Maryland counties — Queen Anne's, Wicomico and Montgomery — and the town of Ocean City already ban balloon releases. Advocates say a statewide ban is needed because airborne balloons frequently cross localities' and even state borders. At least five other states, including Virginia, have similar bans.

Other balloon bans have outlawed intentional releases of multiple balloons, but the Maryland bill applies to the intentional release of even a single one. Releasing more

than one multiplies the penalties. There are a handful of exemptions in the Maryland bill, including releases by anyone younger than 13 or for scientific or educational purposes. The sponsor also agreed to exempt releases by ham radio operators when done as part of their hobby.

Lawmakers in other Bay states have been weighing similar actions. Legislation pending in the Virginia General Assembly, HB2159, would expand that state's current law outlawing mass releases to apply to even a single balloon. In the Delaware General Assembly, the senate introduced a bill this month, SB24, that would impose a penalty of at least \$250 and 8 hours of community service for intentionally releasing 5 or more balloons, but it would also make even smaller releases subject to littering fines. An online petition has been started urging Pennsylvania lawmakers to take action as well.

Cindy Dillon of the Maryland Sierra Club, testifying in Annapolis in favor of that state's legislation, noted that balloons are often released to celebrate some happy occasion, such as a wedding or graduation, or as a tribute to a lost loved one. She suggested there are other, less potentially harmful ways to honor those individuals, such as planting a tree or lighting candles, or



This goldfinch was rescued from what might have been a fatal encounter with a balloon ribbon. (R. Arnold / Courtesy of BalloonsBlow.org)

even drumming.

The latter brought a mild protest from the committee's chairman, Del. Kumar Barve.

"I love the bill," the Montgomery County Democrat said, "but I certainly don't want to encourage people to start drumming." ■

Proposed high-speed train takes aim at ‘irreplaceable’ land

Company officials say refuge route would avoid impacting neighborhoods

By Jeremy Cox

During nearly 40 years as a federal wildlife biologist at the Patuxent Research Refuge, Sam Droege has tromped across nearly every one of its 12,800 acres.

And he doesn't want to see any of them plowed under for a blazingly fast train. That is a growing possibility, though. With plans solidifying for a magnetic-levitation train between Baltimore and Washington, Droege and other conservation advocates are on alert for potential harm to the 85-year-old wildlife refuge.

“It's hard to get across how special and rare this place is,” Droege said. “These places are irreplaceable. It's not something that can be moved and remade elsewhere. It would be like going to the National Mall and removing one of the museums.”

The maglev train project took a key step forward in January when the Federal Railroad Administration and Maryland Department of Transportation published the preliminary findings of a federally mandated five-year, \$28 million environmental and engineering study.

The draft environmental impact study outlines the project in detail: a sleek train floating on a cushion of air inside a U-shaped “guideway,” with all propulsion controlled by magnets. The guideway would run through tunnels bored as deep as 320 feet beneath the surface, and along elevated sections of the route looming 150 feet overhead. The maglev train can reach speeds topping 300 mph, slashing the time of the 36-mile trip between the cities to a mere 15 minutes.

But what has caught the attention of conservationists is the possibility of a largely above-ground section of the route slicing through federal lands just outside the DC Beltway.

Two routes are under consideration. Both mostly parallel the Baltimore-Washington Parkway. The main decision boils down to selecting a more densely populated route to the west of the parkway or an eastern route that crosses into federal lands, including the fringe of the Patuxent Research Refuge.

The new analysis calculates that the eastern route could be constructed atop as much as 24 acres of the refuge's property.



A maglev train makes a stop at Pudong Airport in Shanghai, China. (kallerma, CC-BY-SA 4.0)

A western route would leave it untouched. Both routes would bisect the Beltsville Agricultural Research Center, another federal oasis of open space, with as much as 187 acres being given over to the maglev and its supporting infrastructure.

Conservationists say that inside the refuge, the project would destroy wildlife habitat, upend wetlands and possibly require the re-routing of streams.

“I can't find words strong enough to express what I feel,” said Marcia Watson, president of the Patuxent Bird Club. “It's an environmental disaster in the making. I am outraged that a private company thinks it can waltz in here and take our land.”

Northeast Maglev, the company backing the project, says it will reduce travel times and ease congestion on the often-gridlocked roads connecting Washington and Baltimore. It will also be an economic boon, creating up to 195,000 jobs during construction and supporting up to 440 jobs while in operation, according to the draft study.

The environment will benefit from lower greenhouse gas emissions, a result of converting thousands of drivers into train

passengers, said Wayne Rogers, the company's CEO. The region can also look forward to improved water quality, he added.

“Traffic's hurting everybody. The [Chesapeake] Bay is getting 85 million pounds of [nitrogen] pollution coming into it [from the air], and much of that is from transportation,” Rogers said.

It is not the first time that a maglev has been proposed between Baltimore and the nation's capital. In the 2000s, the Federal Railroad Administration and Maryland Transit Administration got as far as finalizing an environmental impact study and selecting a transportation system based, at the time, on Germany's Transrapid technology. Then came a budget crunch and a legislative blockade on state spending toward the effort.

Northeast Maglev, based in Maryland, revived the idea in 2010. Gov. Larry Hogan, a Republican, began lobbying the federal government to pick up the tab for a new study. The campaign was highlighted by a 2015 trip to Japan in which Hogan rode on a maglev train at speeds exceeding 300 mph. Afterward, he pronounced it an

“incredible experience.”

Japan has vowed to contribute \$5 billion toward construction; the bulk of the \$10.6 billion to \$12.9 billion total cost is expected to be privately funded.

In their new report, the Federal Railroad Administration and state transportation department opted against identifying a preferred route, saying they will consider the public's reaction to the document and other federal agency input before making a call.

Northeast Maglev officials say they favor the eastern alignment, which would impact the Patuxent refuge, because it poses fewer impacts to existing neighborhoods. In Prince George's and Anne Arundel counties, the project has drawn protests from residents who say they will bear all the burdens of the train without any benefits because of the lack of stops. The train would operate between Mount Vernon Square in Washington and the Cherry Hill neighborhood in Baltimore, with a lone stop at Baltimore-Washington International Airport.

A sprawling train-maintenance facility would be raised in the western part of the Beltsville research center, under this building scenario. That area is home to many rare plant species and one of the southernmost of gatherings of pine barrens, said Droege, who works for the U.S. Geological Survey, which has a research facility based at Patuxent. His comments about the project reflect solely his own observations, not his employer's, he said.

A spokesman for the U.S. Fish and Wildlife Service, which oversees the Patuxent refuge, said the agency will voice its opinion when it submits written comments this spring. But in a January 2017 email made public along with the environmental analysis, a Fish and Wildlife official then-stationed at Patuxent told the railroad administration that running the route through the refuge would probably be a “non-starter.”

Patuxent is unique among the nation's more than 500 refuges as the only place set aside for conducting wildlife research, Watson said. “All the other refuges depend on the research done at Patuxent,” she explained.

Fish and Wildlife officials likely will need to complete a “compatibility determination” before deciding whether to allow the company to build in the refuge. And stripping any land from the refuge or agricultural research center is expected to require Congressional approval before it can happen. ■

Baltimore church turns neglected urban forest into ‘peace park’

Project to restore degraded woods enlists help from all around

By Timothy B. Wheeler

Nature has a way, it seems, of getting people to shed their cares for a spell and relate both to it and each other.

That’s what is happening, at least in southwest Baltimore. There, a long-neglected swath of forest in an urban neighborhood that’s had its share of troubles has been reborn as a “peace park.” The church that owns the tract is drawing legions of helpers to transform it into an oasis of contemplation and connectedness.

For Stillmeadow Community Fellowship’s pastor, Michael Martin, the project aligns with the biblical admonition to be good stewards — of the church and its property, of the community in which it is situated, and of the Earth itself.

The peace park links the worship in the sanctuary with what’s going on outside, Martin explained, “taking the holy and the adoration from inside and taking it for a walk, then taking what’s outside and bringing it in here.”

A walking path has been hacked through vines and invasive plants that once clogged the woods to reach a stream and secluded pond. Meditation stations have been set up along the way where visitors can spend a moment in solitude — or maybe glimpse the deer, fox and other wildlife that hang out there.

“I think it’s a model, in some ways, of how to make the most out of what you have,” Martin said.

Now, with the help of multiple partners, from the U.S. Forest Service to school groups and environmental nonprofits, Martin envisions adding an outdoor classroom, community garden and sylvan amphitheater for the surrounding largely African American neighborhood.

On a wintry morning in February, though, it wasn’t safe to walk in the park. A pair of federal foresters wielded chainsaws to fell some of the 60 or so dangerously brittle ash trees that had been killed over the last couple of years by invasive emerald ash borers.

For Morgan Grove, a U.S. Forest Service researcher, the project is a test of whether traditional forestry practices can restore a



Pastor Michael Martin of Stillmeadow Community Fellowship in Baltimore and Yorrell Tuck, operations manager of the church’s charitable nonprofit organization, visit the wooded hillside where trees killed by invasive ash borers and vines are being cut down. (Dave Harp)

degraded urban woodland. They plan to replace the dead ash trees, starting with hybrid poplars. Capable of growing 6 feet in a year, those saplings should rapidly restore the shade needed to prevent more invasive plant growth. Then, they intend to thin out the hybrid trees and replace them with native trees in fenced enclosures to prevent deer from eating them.

“Ultimately, what we’re trying to build is a climate-adapted, resilient forest,” Grove said.

Grove said the Forest Service involvement with Stillmeadow’s peace park is more than just an ecological restoration, though, because it ties in with the church’s efforts to make the park a place for the community to connect with nature and each other.

“It’s healing a forest, but we’re going to be healing a community,” he concluded, noting that “there are a lot of people here who suffer from trauma and stress.”

Martin said he and the congregation have been on a journey the last few years to learn about the church’s forest and what it can mean for the community.

“I’m not a camping dude, but I am a lover of nature,” he said. The forest was so

overgrown when he got here that no one used it, he recalled. But once he ventured into it, he realized its importance and its potential.

“This has really forced us to be educated,” he said. “Now, it’s about understanding what is happening with the Chesapeake Bay, how massive it is and how precious it is and how in danger it can be [and also] clean water and what’s happening to the planet.”

The project gained many of its partners after a flash flood ravaged the area in May 2018. The intense downpour that devastated Ellicott City a few miles to the west also inundated homes, destroyed vehicles and closed streets for weeks around Stillmeadow. They learned that the stream flowing through the church woods contributes to flooding problems when debris clogs up the culvert under the road.

In growing awareness of the need for environmental stewardship, the church has undertaken several greening projects. There’s an apiary for making and selling honey to the community. There are solar panels on the roof and a 600-gallon cistern to capture rainfall. The church is now one of the city’s

“resilience hubs” to help its neighborhood cope with weather- or climate-related disasters.

“We’re in every way attempting to be a green church,” Martin said, and “to have a really light carbon footprint.”

That effort dovetails with the church’s expanding outreach to the community, explained Yorrell Tuck, operations director for the nonprofit that Stillmeadow started to provide services to its neighbors.

In addition to the Forest Service and Chesapeake Bay Trust, the church is getting help with the park development from state and local government agencies and from a coterie of nonprofit groups, including Blue Water Baltimore, Civic Works, Interfaith Partners for the Chesapeake and the National Wildlife Federation.

The effort is also getting a lot of donated labor from students. Three groups of Baltimore area high schoolers recently helped clear felled trees and other debris from the woods and, by all accounts, had great fun doing it.

Some help is even coming from out of state.

McKay Jenkins, a Baltimore-based writer who’s a professor at the University of Delaware, has enlisted students from the Newark campus to pitch in on a weekly basis. He learned about the peace park project through Interfaith Partners, where he serves on the board, and saw it as a great way to teach his students while also helping the church.

“I’ve got legions of students coming down and learning everything from environmental justice to ecology,” he said.

Once the ash trees are cleared, the partners plan to converge at the church to plant the new trees. There are 1,100 cuttings in pots already on site, and another 2,000 are due to be delivered.

Similar efforts are under way to rehabilitate urban forests in places like Philadelphia and New York City, Jenkins and Grove noted, but none quite like this.

“If you can prove you can reforest with hybridized fast-growing trees,” Jenkins said, “maybe you can do this all over.”

But the forest is already functioning as a peace park, Martin stressed. A christening that took place amid the pandemic last fall drew more than 100 people, including neighborhood residents and project partners.

“This park started organically, and we built relationships,” he said. Recalling the crowd gathered that day, he said, “It looked like America. It looked like heaven.” ■



Work began in September to remove approximately 1,800 mature trees from 34 acres of Camp Peary, a military installation in York County, VA. The canopy of the trees had grown so high that conditions were out of compliance with FAA regulations for the site's airstrip. (Dave Malmquist)

Neighbors deplore clearcut at VA's Camp Peary

Locals question military's decision to fell 1,800 trees along wetland

By Tamara Dietrich

The first inkling that something was afoot last September was the sound of thumping and whirring in the woods on the other side of Queens Creek in York County, VA.

"We could hear saws going in the morning and all day, but we couldn't see anything," said longtime resident Nancy Abbott. "And then finally one morning about 7:30 or 8 they broke through close to the creek where we could see it."

She rushed to wake her husband, Carlton. "I said, 'Oh, my God, they're cutting the trees down there at Camp Peary.'"

What they were witnessing from the 180-degree creekside deck of their home in the upscale, wooded waterfront Queens Lake community in Williamsburg was the removal of approximately 1,800 mature trees from 34 acres right up to the creekside wetlands.

For Camp Peary, a military installation, it was a mission critical operation, designed to bring its small landing strip into compliance with FAA regulations.

But for the Abbotts and other local residents, it was an affront environmentally and aesthetically. Their idyllic view — a wide, meandering creek with marsh on

the far side and unbroken forest beyond — was scarred by the clearcut. And with no buffer between the tree felling and the marsh, residents worry about sediment and nutrients eroding into Queens Creek, which flows into the York River and, ultimately, the Chesapeake Bay.

Exceptions for federal agencies

Local and state officials said they have no oversight at military properties like Camp Peary and, if clearcuts are considered mission critical, the environmental regulations and guidelines that apply to anyone else — like leaving a vegetated riparian buffer to

protect wetlands and waterways — are pretty much irrelevant.

"We can't get on Camp Peary," York County stormwater engineer Anna Drake said. "We don't have any jurisdiction over the federal government. We don't have inspectors onsite — they have their own inspectors. And we have to assume that they're taking care of business. From what I see, they always try to, and [they] get all their environmental permits that are necessary, and from what I see they seem to follow all the laws."

"This is a federal installation," said Scott Bachman, a senior forester with the Virginia Department of Forestry. "Silvicultural water quality law is a state law. Federal properties do not have to comply with state law. They supersede state law."

On the other hand, Bachman said, every federal facility in his Blackwater Work Area, which includes York County, has always requested that he inspect their forestry operations, anyway.

"We are not bound to do that," Bachman said. "We do that as a courtesy, and it's just the right thing to do."

He did conduct one on-site inspection at Camp Peary for the tree clearing, although it took so long to get clearance to get onto the base that the tree-felling was already over. Still, he's satisfied that best management practices for logging — like dispersing the harvest activity to prevent rutting, and scattering brush and debris to slow any overland flow — were followed to prevent erosion into the marsh.

Bachman conceded that the lack of a vegetated riparian buffer along the marsh was upsetting for residents. Virginia's Chesapeake Bay Preservation Act requires a 50-foot buffer between logging activity and water bodies. Cutting that takes place for land-use or zoning changes — removing trees to put in condos, for instance — requires a 100-foot buffer.

But this was Camp Peary, Bachman said, and "this is a mission critical thing. You might get a pass on that."

The Department of Defense is required, like all federal agencies, to make environmentally informed decisions, and the Department of Defense's Chesapeake Bay Program commits the DoD to the watershed restoration effort.

The DoD's stated goal is to "integrate restoration, pollution prevention and stewardship initiatives" for the Chesapeake Bay into its daily mission and to "partner with federal, state and local governments, and organizations and citizen groups to maximize resources and strengthen Bay restoration and protection efforts."

In 2010, the DoD signed onto a strategy written by representatives of federal agencies to help reduce nutrient and sediment pollution to waterways, restore forest buffers, restore and enhance wetlands and protect wildlife habitat, among other commitments. But pollution control exemptions are allowed on a case-by-case basis for military training or readiness for the sake of national security.

Back and forth

Camp Peary is a 9,000-acre military reservation between the York River and Queens Creek. It's named for Robert Peary, a rear admiral and Arctic explorer, but is officially called the Armed Forces Experimental Training Activity, or AFETA. It hosts a CIA training facility commonly known as "the Farm," which has earned mentions in films and in fiction. The Defense Intelligence Agency and U.S. Navy also have interests there.

The base and the private environmental consultant hired for the project didn't respond to multiple requests for comments for this article.

But an email summary provided to York County by the environmental consultant in response to residents' concerns states that the timber harvest was part of the base's ongoing timber management and forestry program and that the tree canopy's height had violated FAA flight rules.

"Trees ... which adjoin the airfield have reached a height at which they are interfering with flight operations, such that the airfield is no longer in compliance," the email states.

Residents counter that the landing strip

sees very little air traffic throughout the year, and they said the base didn't seriously pursue alternatives, like simply cutting back some canopy or at least leaving a riparian buffer.

The summary also claims that the tree clearing "does not require any habitat regulatory permits as no wetlands or waters of the U.S. will be impacted."

Residents strongly dispute this.

"It's a blatantly false statement," said David Malmquist, who holds a doctorate in Earth science and has lived in Queens Lake for years. "Trees obviously don't grow in the salt marsh, but runoff of sediment freed by their removal certainly impacts the marsh."

Sediment runoff is restricted under the "pollution diet" that Bay states agreed to as part of a watershedwide partnership to restore the Chesapeake.

As for the clearcutting, Malmquist said, "no private landowner would ever rightfully be given the right to do that, to cut down almost 2,000 trees within a Resource Protection Area, which is in direct contradiction to the spirit and the letter of the law about leaving a riparian buffer along a creek."

"And it's not just the trees," he added. "It's all the animals that live in the trees and the shorebirds and the viewshed."

Residents are also upset that they weren't notified in advance of the clearcutting plan and that Camp Peary and the environmental consultant wouldn't respond to their concerns once the logging began.

'It didn't have to be this disastrous'

Carlton Abbott is an award-winning architect who has worked on numerous national, state and urban parks, including projects on the George Washington Parkway



Carlton and Nancy Abbott are among the residents angered by the military's decision to cut down 34 acres of trees at Virginia's Camp Peary. (Dave Malmquist)



Equipment is seen among a portion of the land at Virginia's Camp Peary where trees were removed. No vegetated riparian buffer was retained between the cleared area and the adjoining marsh. (Dave Malmquist)

and the "Historic Triangle" of Yorktown, Williamsburg and Jamestown.

His late father, Stanley Abbott, was a renowned landscape architect and primary designer of the Blue Ridge Parkway. Stanley Abbott bought a little more than 5 acres along Queens Creek in the 1950s, and in 1966 father and son designed and built the family home, which was once featured in *Southern Living* magazine. Carlton and Nancy Abbott have lived there since 1987.

The home's deck is fronted by walls of windows to take in the breathtaking view of a waterway that at one time took George Washington to the House of Burgesses.

When visitors see the view now, Nancy Abbott said, "their jaws drop. They gasp. It's such a scar."

With the trees gone, the Abbotts now have a view of industrial buildings on the base. And, at night, safety lights shine across the creek.

Carlton Abbott says he avoids the deck now "because I don't want to get depressed about it."

"I love my government," he added. "But it didn't have to be this disastrous."

"For me, it's a punch in the gut," Malmquist said. "I feel like our neighborhood is under siege environmentally. On one side, we have the Interstate-64 widening,

and they cut down all the trees on that side. And this is a place where the entire neighborhood recreates on the creek. There's our marinas. It's where everybody walks their dogs and the beautiful — the previously beautiful — view over Queens Creek. And the clearcut is right where you look. You can't avoid it."

Bachman says Camp Peary plans to replant the site with short-leaf pines that are slower to grow than the loblollies and other species that got harvested, reducing the need to clearcut again for a while. And the site will naturally regenerate over time.

"It's certainly a changed view," Bachman said. "And that view will change every year. But it's going to remain in woody vegetation. Will it be 80-foot tall? No. But it will be in woody vegetation. It's not going to be in concrete. It's not going to be ripped."

But the Abbotts doubt they'll be around to see the trees return.

"By the time the trees grow back, our time here will probably be gone," Nancy Abbott said. "So it'll never in our lifetime be what it was. That's what's the most devastating. We've held this property as sort of sacred. I feel a little selfish in a way because we've had our own 'national park' for years. And I know that it'll never be, in our lifetime, the beauty that it had been." ■

Lawsuit targets MD chicken industry's ammonia emissions

Environmentalists seek regs for air pollution that falls on, fouls water

By Jeremy Cox

East of the Chesapeake Bay in Maryland, more than 2,000 chicken houses form one of the densest congregations of their kind in the country. The state has enacted some of the nation's toughest water-quality regulations to prevent the \$2.7 billion industry from polluting the Bay and its tributaries.

But state and federal regulations for large animal operations allow them to pollute the air without limits or penalties. The result: Those chicken complexes unleash millions of pounds of ammonia into the air annually.

Environmentalists contend that those emissions may be increasing as poultry operations expand, hampering efforts to clean up the Chesapeake because of one of the most basic laws of Newtonian physics: What goes up must come down. And some of what comes down ultimately winds up in waterways.

An Eastern Shore-based environmental group has filed a lawsuit against the Maryland Department of the Environment in Montgomery County Circuit Court contending that the state should crack down on air emissions to protect waterways. The plaintiff, the Assateague Coastal Trust, argues that when the state recently updated water protection regulations aimed at chicken houses, they should have been broadened to address airborne ammonia.

Normally, air emissions are regulated under the federal Clean Air Act, but it has not been used to control ammonia from agriculture. The U.S. Environmental Protection Agency has long contended it lacks the data to set proper emission standards for industrial-scale animal operations. Under increasing legal pressure to do something about it, the agency in 2005 began studying emissions at dairy, egg, hog and poultry operations. But progress has been slow; the ammonia models for poultry farms are expected to be published this summer, according to the agency.

Absent any action to control it under air laws, environmental groups say it should be regulated under water regulations because ammonia is a form of nitrogen that, once it drifts down from the air and enters waterways, can trigger algae blooms that absorb great amounts of oxygen when they die,



Thousands of chickens cover the vast floor space of a Delmarva chicken house. (Dave Harp)

creating “dead zones” for aquatic life.

“This is the primary pollutant from this industry,” said David Reed, an attorney with the Chesapeake Legal Alliance, which filed the lawsuit last October on behalf of the trust. “It just simply seems a dereliction of their duty not to regulate it.”

To regulate an air pollutant under their water-permitting authority, MDE officials counter, would open a Pandora’s box of red tape. Water permit holders — from all industries, not just agriculture — would have to seek new permits or modify existing ones if their facilities vent pollutants into the air. Air permit holders also might need new approvals if their emissions are found to impact waters.

If the judicial branch sides with the environmental group’s interpretation, said Matthew Standeven, the attorney assigned to the MDE by the state attorney general’s office, the water pollution law would become “completely unworkable.”

The region’s poultry industry is watching the case closely. Since 2009, when the state significantly broadened the scope of its chicken house regulatory program, the raft of rules has withstood several cycles of public comment and judicial review, said James Fisher, a spokesman for the Delmarva

Chicken Association. The trade group, he said in a statement, remains confident that “the permit meets the water quality protection standards set by the [EPA].”

Ammonia’s day in court

Regulators at state and federal levels nationwide have long been vexed by the problem of pollution traveling from one medium to another, such as from air to water. The problem, they say, is that the nation’s bedrock environmental laws — the Clean Water Act and Clean Air Act — were designed to manage pollution within their own lanes. The laws are virtually silent on what happens when a pollutant changes lanes, such as airborne ammonia settling on water.

Under the EPA, large chicken operations are regulated as concentrated animal-feeding operations, or CAFOs, under the Clean Water Act, even though they have substantial air emissions. Pushback from the agricultural community and some members of Congress has long stymied efforts to even monitor those emissions. That could change, though, because of growing concern about the potential impact of those emissions on human health. Ammonia is a major ingredient in soot, a pollutant that can exacerbate a

host of respiratory illnesses from asthma to COVID-19.

Like many states, Maryland oversees CAFO water pollution regulations on behalf of the EPA. The state finalized the revision of its “general discharge permit” last July after a lengthy public review period, which included a green light from the EPA. The Assateague Coastal Trust filed its lawsuit in October.

During the case’s hourlong oral arguments on Jan. 26, Judge Sharon Burrell didn’t tip her hand on how she might rule. (She said she would issue a written ruling but didn’t indicate when that would happen.) But Burrell did ask several pointed questions about the state’s positions.

She noted that the MDE fully agrees that air is one of the primary pathways for chicken CAFOs to pollute the Bay with nitrogen. “Was it considering this at all [in the development of the water permit] or was it saying, ‘This is somebody else’s department?’” Burrell asked.

“There’s going to be a certain amount of nitrogen pollution that the department believes it can’t regulate through this particular mechanism,” Standeven said.

Another question from Burrell: If the MDE believes it can only address

waterborne contaminants from agriculture, why does the agency's permit instruct farmers on how to grapple with "nuisance odors"? Here, Standeven said, officials were just "being responsive" to concerns raised by residents who live near chicken houses.

Air pollution lies beyond the scope of the Clean Water Act's intent, he added. The MDE attorney cited a 1997 opinion issued in the 10th Circuit Court of Appeals. In that case, the panel wrote that someone "may be correct in arguing that an object may fly through the air and still be 'discharged ... into the navigable waters' under the Clean Water Act, [but] common sense dictates that [those] emissions constitute discharges into the air — not water."

How much is too much?

In chicken operations, the largest source of ammonia is the birds' urine. Each chicken house is equipped with a battery of giant exhaust fans that draw out the noxious fumes inevitably produced by raising thousands of birds in a confined space.

Researchers have long known that at least some of the ammonia that escapes from Eastern Shore chicken houses tumbles back onto the land and water within the Bay watershed. But determining the precise amount has been complicated.

In 2019, researchers at North Carolina State University compiled the most detailed and wide-ranging figures to date. Their study estimated that 24 million pounds of ammonia fall back onto the Eastern Shore after being emitted by CAFOs — and a portion of that, it stands to reason, falls into Bay tributaries and likely the Bay itself. Attorneys for the Assateague Coastal Trust cited the study's findings as evidence of the problem.

But the study's authors admit that their results present more of a worst-case scenario than an exact reflection of reality. Because of a lack of public information about emissions, the analysis assumed that the chicken houses



An aerial view shows the concentration of chicken houses on the lower Delmarva Peninsula. (Dave Harp)

are functioning at full capacity every day of the year, although that is never the case. It also didn't account for the practices that farmers use to reduce ammonia emissions, such as adding treatments to the chickens' bedding material.

Familiar foes

The Assateague Coastal Trust, named after the barrier island south of Ocean City, MD, that it helped to preserve, has long been a thorn in the chicken industry's side.

In 2010, the group was one of a handful of organizations that filed a federal lawsuit against a chicken farm in Worcester County contracted to Perdue Farms, accusing it of polluting a Bay tributary. The case centered on an uncovered pile of fertilizer that the plaintiffs claimed was chicken manure. State

investigators later determined it to be sewage sludge, a revelation that hampered the litigation. A judge sided against the environmental groups.

In recent years, the Assateague Coastal Trust has turned its attention to the permitting process, securing public hearings on certain projects that would otherwise not have fallen into public view. And it has been one of the most prominent voices for years in favor of state legislation that would set up air monitors around the region's poultry hot spots.

The bill has gained little traction in Annapolis.

Study to guide the industry's fate

In the meantime, the MDE has begun conducting a smaller version of the air study that critics had sought, taking measurements at two stations near poultry operations on the Lower Shore — near Pocomoke City and Princess Anne. The results will be compared with two stations that have no chickens nearby — the Horn Point Laboratory west of Cambridge and the Old Town neighborhood in Baltimore.

The year-long measurement phase is expected to end later this spring. MDE officials say they plan to use the information to help determine if any additional steps need to be taken to protect the environment or public health.

Initial results suggest that ammonia counts are much higher in short bursts of time near the chicken houses than at the comparison locations. But, over time, the air

quality is not much different between the two locations.

From April to December 2020, the maximum concentration of ammonia in Pocomoke, where chicken CAFOs proliferate, topped out at 177 parts per billion over the course of one particularly high hour. The peak in Baltimore was 27 ppb.

But the average hourly value was about 11 ppb near Pocomoke and 6 ppb near Princess Anne. In his statement, Fisher of the Delmarva Chicken Association called attention to the Princess Anne average, noting that it was lower than the 7 ppb average recorded at Baltimore.

"In other words, the data collected so far show nearly no difference in average ambient ammonia concentrations between areas with chicken farms and areas without them — and show that average ambient ammonia levels are, in fact, lower in the Princess Anne area than in chicken-farm-free Baltimore," Fisher said.

None of the readings — whether taken near or far from chicken farms — came close to the MDE's air-quality threshold for ammonia of 350 ppb per hour.

Environmentalists say the study should include several more locations to truly measure the impact of the industry's CAFO emissions. And they are leery of whatever the MDE may find, because the Delmarva Chicken Association is one of the study's main financial supporters. MDE officials, though, say the trade group has no hand in its design or execution. ■



A trio of chicken houses near a road on Maryland's lower Eastern Shore feature giant exhaust fans that pump ammonia-laden air out of the buildings. (Dave Harp)

Prescription for Northern Virginia: low-salt diet for roads

Management strategy offers guidance for improving stream health

By Timothy B. Wheeler

Hoping to reverse a serious threat to the health of Northern Virginia streams, state officials have assembled a hefty toolkit aimed at helping the region's paved surfaces go on a reduced-salt diet.

Wintertime salt use to melt snow and ice on roads, parking lots and sidewalks has been increasing for years across the region, and it's known to have impaired aquatic life in at least one Potomac River tributary, Accotink Creek. Other streams, and even drinking water reservoirs, are similarly threatened.

In January, the state Department of Environmental Quality unveiled a salt management strategy for Northern Virginia, spelling out a plethora of steps the government, businesses and citizens could take to reduce the environmental impacts of de-icing.

"Our goal is not to say, 'Stop using salt,'" said Will Isenberg, a water quality specialist in the DEQ's Watershed Programs and Office of Ecology. "Our goal is to try to strike a balance [between the safety benefits of de-icing and its harmful impacts]."

The strategy lays out more than 400 pages of background and dozens of suggestions for how everyone, from municipal snowplow drivers and snow-removal contractors to homeowners, can reduce wintertime salt use without sacrificing safety.

Work on the toolkit began three years ago, after state regulators imposed "pollution diets" on stretches of Accotink Creek because of excessive chloride levels there in winter. Under those diets, or total maximum daily loads in regulatory lingo, Fairfax County is under orders to take steps to restore water quality.

To draft the strategy, the DEQ assembled a group of 63 individuals representing 43 stakeholders in Northern Virginia and held a series of meetings.

Salt spread on pavement to melt snow and ice dissolves in the melting runoff. Excessive salt can harm aquatic insects, frogs, salamanders and freshwater fish in streams, and it can kill trees and vegetation along the roads. In drinking water supplies, it poses a human health hazard, particularly for people with hypertension or heart problems. Salt



An uncovered salt pile stands in the parking lot of a shopping plaza in Springfield, VA. (November 2018 / Glenda Booth)

can also corrode roads, bridges and vehicles, shortening their useful lives.

Other streams in Northern Virginia have not been analyzed as thoroughly as Accotink, but monitoring by the U.S. Geological Survey of neighboring watersheds detected spikes of "specific conductance," an indirect measure of the presence of sodium or chloride in water.

The problem is not limited to Northern Virginia. A 2014 study reported that heavy use of de-icing salts had raised salinity levels beyond what's good for aquatic life in 40% of urban streams nationwide.

Rising salinity is a symptom of a broader ailment afflicting Northern Virginia streams. Pavement and buildings in the heavily suburbanized region cover, on average, 26% of the land in stream watersheds, increasing polluted stormwater runoff. Studies have shown that streams begin to show ecological impacts when as little as 2% of their watersheds are covered by impervious surfaces, and degradation becomes significant once the percentage exceeds 10%.

For Accotink, the DEQ was required to draw up a series of plans to reduce chloride levels in the stream. Agency officials say they developed the salt management strategy as a way to avoid having to take more regulatory action on other regional streams. They say

regulation alone won't be enough to reverse trends anyway because a significant amount of the salt washing into streams is coming from private property that is not subject to regulation.

"There are no mandates," Isenberg said. Rather, he added, "There is an opportunity for everybody to win through this, be it cost savings, reduced impact or what have you."

Lauren Mollerup, assistant maintenance administrator in Northern Virginia for the state Department of Transportation, said highway crews have already adopted a number of best practices aimed at reducing salt use by applying it more efficiently. Even a small change in the amount of salt applied can make a big difference, with about 17,000 lane miles of roads and highways to treat in the region, more than enough to drive to California and back three times.

A similar salt management plan produced in Minnesota five years ago, on which the Northern Virginia strategy is modeled, yielded salt-use reductions of 30–70%. That translates into cost savings for taxpayers, property owners and homeowners.

The key to judging the strategy's success, though, will be whether and how quickly chloride reductions happen in streams.

There's something for everyone in this voluminous document, which is divided

into sections, each written specifically for a particular user of de-icing compounds. The strategy includes measures that, except perhaps in rural areas, have become widespread, such as applying heavily salted water, or brine, to pavement before a storm arrives.

The bottom line: A little salt goes a long way. One 12-ounce mug of sodium chloride — common table salt — is enough to melt snow or ice on a 20-foot-long driveway or on 10 sidewalk squares.

The plan provides a menu of alternative materials and methods for preventing or clearing snow and ice. Homeowners, for instance, are encouraged to look at spreading bird seed on top of snow or ice instead of rock salt. The seed provides traction on slippery surfaces, and cleanup is less of a chore because birds eat most of the seed.

Now that the strategy has been published, the state is handing off to the Northern Virginia Regional Commission the tasks of spreading the word about it and monitoring its effectiveness.

But Sarah Sivers, who heads the DEQ's water quality planning team, cautioned, "This is not a short-term fix." It will take a long-term effort to bring down salinity levels in streams, she added, but the toolkit is a first step. ■

Land use tied to ‘intersex’ smallmouth bass in Bay rivers

Study suggests runoff controls could reduce hormone disrupters

By Timothy B. Wheeler

Scientists are still trying to sort out exactly what’s causing sexual abnormalities among smallmouth bass in Chesapeake Bay rivers, but they may be getting closer to figuring out how to reduce them.

Prompted initially by disturbing fish kills in the Potomac and Susquehanna rivers, researchers have been on a quest for nearly 20 years to understand what’s impacting the health of smallmouth bass, a popular freshwater recreational catch throughout the Bay watershed.

While studying die-offs, skin lesions and infections seen in both adult and juvenile bass, scientists began noting “intersex” conditions in Potomac and Susquehanna fish. They’ve found cells in the sex organs of males that are usually found only in females, as well as a protein that’s produced by females to form the yolk around an egg.

Extensive water sampling in Bay rivers has also documented the presence of hormone-disrupting chemicals, which have been linked to the development of intersex traits in bass.

There appears to be no one source of those chemicals in Bay tributaries, but a pair of new research papers suggest that efforts to reduce nutrient and sediment pollution also could help reduce chemical contaminants — and possibly the intersex abnormalities.

After conducting a statistical analysis of water and fish samples collected at multiple sites over several years, a team of U.S. Geological Survey scientists found that land use nearby or upstream was linked to the levels of hormone-disrupting contaminants measured in the water.

Higher levels generally were found in waters that drained farmland, the USGS team reported in the March issue of the journal *Chemosphere*. But the levels could also be affected by the extent of crop cultivation and the type of crop being grown. Soybeans, for instance, generate natural estrogens. Levels were even higher near fields where hormone-disrupting herbicides such as atrazine and metolachlor had been applied, the study found.

The USGS team also found elevated estrogenic or hormone-disrupting substances



Kelly Smalling, a researcher with the U.S. Geological Survey, prepares to filet a fish for chemical analysis. (USGS)

in waters draining some more urban settings, especially those with a lot of pavement or high numbers of septic systems treating wastewater.

“We did find [that] scale matters,” said Vicki Blazer, the study’s lead author. In the immediate catchment basin being studied, they saw impacts associated with pesticide applications, percent of land cultivated and the presence of septic tanks. But some impacts could also be connected to factors farther upstream such as runoff and the extent of pavement and buildings. They also sampled early and late in the year to see if the effects varied by season.

Previous studies have linked feminization of male bass with exposure to effluent from municipal wastewater treatment plants, but sampling in the Potomac River near sewage plants found no such pattern. Still, Blazer indicated she isn’t ready to rule out wastewater plants as sources, saying there hasn’t been enough sampling to do that.

Another clear message from the data: Levels of hormone-disrupting chemicals tend to be lower in stretches of river lined

with trees, or even bushes.

“I think that basically what that’s telling us is that riparian zones are important,” said Blazer, a biologist in the USGS Leetown Science Center in Kearneysville, WV. “We’ve known that, but it gives us more evidence.”

Streamside forests have long been recognized as one of the most effective ways to reduce nutrient and sediment pollution from land. Trees and shrubs slow down stormwater runoff, trapping sediment and allowing nutrient-laden water to soak into the spongelike soil in forests.

As part of their commitment to reducing nutrient and sediment pollution, the Bay states have pledged to plant 900 miles of forest buffers annually, but they have fallen far short of that goal to date.

Other Bay restoration practices may also offer hope for limiting estrogenic chemicals in rivers and streams. In a separate study, USGS scientists found indications that the number or density of best management practices put on farmland to control nutrient and sediment pollution influenced the levels

of hormone-disrupting compounds detected in nearby streams.

Researchers tested water samples for 301 organic chemicals to assess the benefits of agricultural best management practices to contaminants’ levels in streams and rivers. They focused their analysis on a handful of contaminants that had shown up most often: the herbicides atrazine and metolachlor; natural estrogens produced by crops and other vegetation; and cholesterol, which might be coming from either human or animal waste.

They compared those contaminant levels to U.S. Department of Agriculture data on the number of best management practices that had been installed near the five study sites — three in the Susquehanna and two in the Potomac watersheds.

Writing in the journal *Science of the Total Environment*, the USGS scientists reported that contaminant levels were lower in areas that had the most farm conservation practices.

The effect of farm runoff controls was most apparent when looking at crop fields where the herbicides atrazine or metolachlor had been used, said Kelly Smalling, lead author and research hydrologist in the USGS New Jersey Water Science Center.

“As BMP density increased, the concentrations of atrazine and metolachlor decreased” in the water, Smalling said. Atrazine is of concern because it’s one of the most widely detected chemicals in surface water in the Bay watershed. Metolachlor, another herbicide, is the second most heavily used agricultural weed killer after glyphosate.

But the researchers also found that BMP intensity had a positive effect on levels of other contaminants in streams, including estrogenic compounds produced by plants and cholesterol. “There’s less runoff making it into the streams” Smalling said, and that’s reducing contamination.

She cautioned that the findings were based on sampling at only five sites and therefore too limited to be conclusive. Nor could this study determine whether some conservation practices were more effective than others, she noted.

But she added that “we think this is the beginning of saying there could be co-benefits” to reducing hormone-like contaminants from efforts to control nutrient and sediment runoff. Smalling called that “pretty exciting.” ■



Scour Bay for sparkle of sea glass

By Jeremy Cox

Like a stalking predator hearing movement in the bushes, Linda Starling froze, her senses perched on a hair trigger. At first, the only obvious sound along this sandy stretch of shoreline was the dull rumble of jets idling on the runway across the Chesapeake Bay at Naval Air Station Patuxent River.

But there it was again, unmistakable this time: a high-pitched tinkling emanating from the soft boundary between land and water.

“Did you hear that?” Starling asked, with growing excitement. “You can hear the glass in the water.”

Sea glass, as it’s called, whether it’s found in an ocean, bay or river, begins as litter in the water. Then wind, waves and sand intervene, shaping and sculpting, polishing and smoothing. Years, perhaps even decades, pass. On the far side of its journey, the glass morphs into something else, something more than an ordinary shard of silicate. Something collectible.

Wherever in the world shells, driftwood or other debris wash up along the edge of the water, it’s a decent bet that sea glass is sprinkled in as well.

With more than 11,500 miles of shoreline on the Bay and its tidal tributaries — more than the entire U.S. West Coast — the Bay is like a huge catcher’s mitt for floating detritus like sea glass. And it has a ready supply from a range of sources: junk jettisoned from cargo ships, cast-off glassware from long-shuttered waterfront factories and

underwater caches of trash from when the Bay moonlighted as a de facto landfill.

In the Bay and its rivers, as opposed to the ocean, glass generally takes longer to transform into sea glass (decades as opposed to years) because of the relatively gentle waves and lower salt content, avid collectors say. But once the glass is finished “cooking,” it emerges with a frosted patina, rounded edges and vivid coloring — in short, all the desired hallmarks.

Sea glass hunting has quietly forged its own niche among Chesapeake pastimes, supporting a cottage industry of boutiques, where colorful glass bits of all sizes can be found adorning necklaces, earrings, bracelets, suncatchers, wind chimes, holiday ornaments and more. It has also given rise to festivals devoted mostly to sea glass art and products. The Eastern Shore Sea Glass and Coastal Arts Festival in St. Michaels, MD, for instance, is believed to be the largest festival of its kind on the East Coast.

When it was launched nine years ago, the festival had four vendors and a proportional number of sea glass seekers. By 2019, the festival had mushroomed to 90 vendors attracting about 14,000 people, expanding the population of St. Michaels by 12-fold over the two-day period.

The COVID-19 pandemic forced the cancellation of 2020’s festivities and postponed this year’s



April showcase. Organizers are tentatively looking at November 2021, if the virus can be brought to heel by then.

In another indication of the hobby’s ascendancy around the Chesapeake, enthusiasts have raised more than \$25,000 via a GoFundMe site to establish a brick-and-mortar museum on Maryland’s Eastern Shore to house “beachcombed” items.

And then there are the countless hobbyists, like Starling, who ply their upcycled wares online and on the region’s arts and crafts fair circuit. Her work typically pairs sea glass with sterling silver settings, hoops and chains, displaying both rustic and refined characteristics.

A part-time office worker at the Horn Point Lab in Cambridge, MD, Starling came by her interest in sea glass casually. In 2002, she bought a second home on Hooper’s Island, a fishing village on

Top photo: With more than 11,500 miles of shoreline, the Chesapeake Bay and its tidal tributaries act like a huge catcher’s mitt for sea glass. (Dave Harp)

Inset photo: Sea glass is shaped and polished over years and decades by wind, sand and waves. (Dave Harp)

a fragmented island of the same name west of Cambridge, and began talking walks along the shoreline. Gathering sea glass gave meaning to her outdoors time and eventually a gainful purpose.

Although she has since moved inland, Starling returns regularly to Hooper's Island to add to her collection, including a chilly afternoon last December. Her hunting ground that day was a sliver of beach at the southern tip of Upper Hooper's near the causeway and high-arched bridge that leads to Middle Hooper's.

Landward, phragmites gripped the sand, forming a tenuous escarpment. Waves lapped lazily at the shore. Starling had timed her visit around low tide, when the receding water provides more bottom for buck. As the tide ebbed, it revealed a mosaic of shells, oyster halves and chunks of red brick. The latter was a promising sign, she said, that this had been a dump site in the past and might contain a healthier supply of sea glass.

But, alas, that day's hunt was a bust. There were plenty of specimens, but virtually all were too "young," not nearly worn enough for her specifications. "Do you see all the rough edges and sparkly spots?" she asked, pinching the former bottom of a brown bottle between her fingers. "This [should] go back for more polishing. ... You don't want any rough edges or chips for jewelry-quality."

Sea glass hunters are usually tight-lipped about their favorite spots, fearing any advertisement will bring more foot traffic and deplete the supply. Word apparently had gotten out about this one. When Starling arrived, there was already another stooped figure on the shore.

That was Pam Grosz, who had made the hour-plus drive from Salisbury. Like Starling, she planned her day around the rhythms of the tide. She started collecting sea glass around the time the pandemic-induced lockdowns began in March 2020, she said.

"I needed something to get me out," Grosz said.

Sea glass may be the embodiment of the adage that one person's trash is another's treasure. Kim Hannon, president of the North American Sea Glass Association and the lead organizer of the St. Michael's festival, admits as much.

"There is a fine line," she said. "Some people would consider it trash even if it was completely finished and smooth." But, she added, "I think more people are seeing the value in it."

For evidence, she points to "fakers," people and companies that run new glass through rock tumblers or treat it with acids to simulate gradual weathering. One of the driving forces behind the creation of the Sea Glass Association about a decade ago was for devotees of authentic sea glass to build an organizational firewall against artificial competition, Hannon said.

Spotting the difference can be difficult without a magnifying glass and a trained eye.

In authentic sea glass, the most desirable types are orange, yellow and pink because of the dearth of glassware bearing those hues. Green, brown and milky white, meanwhile, are a dime a dozen. And



there is no ideal size; collectible pieces may range in size from mere flecks of glass to fully intact bottles.

Some of the best places to find sea glass in the Chesapeake, enthusiasts say, are also among its most picturesque — the unhurried beaches and coastal parks. Examples include the beaches adjacent to the working waterfronts of Deal Island and Crisfield in Somerset County, MD; Claiborne in Talbot County, MD, where the Chesapeake ferry used to land; and Anne Arundel County's Fort Smallwood Park, with its crescent-shaped shoreline at the mouth of the Patapsco River.

Others prefer to hunt by water, trading mud boots for kayaks, to search the shallows or come ashore in places hard to access by land. Winter is a good time to look for sea glass, Hannon said. There is a greater frequency of storms that churn up the water and deposit glass on the shore. She and other hunters often visit their favorite places the minute a storm passes, hoping to find the good stuff before anyone else gets there.

The Chesapeake has a national reputation

among collectors as a must-visit destination for cobalt blue glass, one of the most prized colors. The shuttered Bromo-Seltzer plant in Baltimore is believed to be the primary source.

The hobby, though, is under threat around the Chesapeake and worldwide, said Hannon, who operates shops heavy in sea glass merchandise in St. Michaels and Kent Narrows, both called Ophiuroidea, a taxonomic family closely related to that of the starfish.

The stockpile of sea glass lurking in the shallows is dwindling. Manufacturers have transitioned from glass to plastic as their packaging material of choice. And what glass remains in the trash stream is less likely to end up in the water because of recycling, dumping bans and anti-littering campaigns.

Finding good-quality sea glass takes more effort these days, Hannon said. But it's still worth it.

"If there's a good spot that you know of that not a lot of people can access," she said, "that would be a place where you can still find a lot." ■



HUNTING TIPS FOR SEA GLASS

- Find a beach that is strewn with shells and debris. It's more likely than a "clean" beach to have sea glass.
- Head out at low tide. More land equals more room to search.
- Search with the sun to your back and look for sparkles.
- Storms stir up the water and everything in it. Time your searches for after they strike.
- Stick to public property. If you want to hunt on private land, get the owner's permission first.

Top photo: Standing out from the shells and stones on a Chesapeake Bay beach is a piece of cobalt blue sea glass, prized by collectors for its striking color and relative rarity. (Dave Harp)

Bottom photo: Sea glass collector and jewelry maker Linda Starling hunts her quarry along the water's edge in Dorchester County, MD. (Dave Harp)



Day lilies emerge from the mud. Soon they will bear bright orange blooms. (Dave Harp)

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Don't be fooled by their beauty. These are two invasive vines: English ivy and Oriental bittersweet. (Dave Harp)

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A loblolly pine, foreground, clings to slightly higher ground and thus lives while the majority of the trees in this increasingly wet area on Taylors Island, MD, are dying. (Dave Harp)

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Essex, MD |

Bay Barometer tracks progress for 31 targeted outcomes

By Rachel Felver

The Chesapeake Bay Foundation's *State of the Bay Report* came out in early January. The University of Maryland Center for Environmental Science will release their *Chesapeake Bay Report Card* in June. And the Chesapeake Bay Program is announcing their 2019–20 *Bay Barometer* now. Are all of these different Bay assessments really, well, different?

The answer: They are, but only slightly. All three entities use similar data sources to calculate their reports, and most of that information comes from the many partners of the Chesapeake Bay Program. Some of the data can be from different years, depending on when the reports are released. For example, the *State of the Bay Report* comes out every two years, while the *Chesapeake Bay Report Card* and the *Bay Barometer* come out every year.

Unlike the other two reports, the *Bay Barometer* from the Chesapeake Bay Program does not assign a letter grade to describe Bay health; rather, we present the most up-to-date information available for the 31 targeted outcomes of the *Chesapeake Bay Watershed Agreement*. We aim to report that data in an easily digestible manner, using charts, graphs and progress statements.

Various iterations of the *Chesapeake Bay Watershed Agreement* have guided the work of the Bay Program for close to 40 years. The most recent version, signed in 2014, commits our many partners to meet a variety of outcomes ranging from blue crabs to environmental literacy to stream restoration. The *Bay Barometer* presents the most up-to-date data that are available for the outcomes that have measurable targets, which we refer to as indicators.

There are 19 outcomes that have indicators, which are updated on a variety of timelines depending on data availability. You don't need to wait for the most recent *Bay Barometer*, though, to check on Bay restoration progress! When we receive new data for a particular indicator, it is updated in real-time at ChesapeakeProgress.com.

Out of those 19 indicators, 12 have updates in the 2019–20 *Bay Barometer*. Here are some highlights.



A Chesapeake Bay blue crab clings to the edge of a dipping net. A healthy blue crab population is one among many targeted outcomes for the Bay restoration effort, with progress tracked in the Chesapeake Bay Program's annual Bay Barometer. (Dave Harp)

- While there was a 26% decrease in the amount of adult female blue crabs found in the Chesapeake Bay from 2019 to 2020, the overall number (141 million) is still considered to be sustainable and healthy, despite falling below the 215 million target. Researchers estimate that 17% of all female blue crabs in the Bay were harvested in 2019, which falls below the overfishing threshold.

- The target for the oyster outcome was reached when 10 Bay tributaries were selected for large-scale oyster restoration. As of 2019, the sites are in various stages of progress, with 788 acres of oyster reefs considered complete in Maryland and 539 acres in Virginia.

- Only 66,387 acres of underwater grasses were estimated in the Bay in 2019, a significant decrease (38%) from 2018. Experts attribute the decline to a decrease in widgeon grass, which is highly susceptible to weather impacts and changes in water quality. This marks an achievement of 36% toward the 185,000-restoration goal.

- Between 2018 and 2019, approximately 83 miles of forest buffers were planted along rivers and streams in the Bay watershed, marking a 0.09% achievement toward the goal of planting 900 miles of buffers each year.

- As of 2019, Bay Program computer modeling tools indicated that between 2009 and 2019, practices are in place under the Bay TMDL to reduce 11% of nitrogen, 10% of phosphorus and 4% of sediment pollution loads from flowing into the Bay.

- Between 2016 and 2018, experts estimated that 38% of the Bay and its tidal tributaries met healthy water standards. Additionally, from 2017 to 2018, river flows entering the Bay averaged 70.5 billion gallons of water per day. This allowed for 423 million pounds of nitrogen, 42.1 million pounds of phosphorus and 15,689 pounds of sediment pollution to enter the Bay.

- The Bay Program has protected 1.36 million acres of land since 2010, achieving 68% of its target to conserve an additional 2

million acres across the watershed by 2025.

- Between 2010 and 2019, 194 boat ramps, fishing piers and other public access sites were opened on or around the Bay, marking a 65% achievement of the goal to open 300 new sites by 2025.

- In their effort to develop a comprehensive, systemic approach to environmental literacy, 27% of surveyed local education agencies around the watershed self-identified as “well-prepared” to deliver high-quality environmental literacy programming to their students in 2019. Additionally, 32% of the agencies reported providing a meaningful watershed educational experience to at least one grade level in elementary school, while 38% provided a MWEE to at least one grade level in middle school and 43% provided a MWEE to at least one grade level in high school.

- Since 2016, the Chesapeake Bay Program has seen a slight increase in meeting the target of identifying stakeholders of color not currently represented in the partnership. Those that self-identify as people of color rose to 14.6%. Additionally, the number of people in leadership positions at the Bay Program that self-identify as people of color rose to 10.3%.

Each outcome in the *Watershed Agreement* has a workgroup dedicated to meeting its goals. Want a fun fact? While each workgroup has a coordinator and a staffer to manage the day-to-day work, many of the other members participate on top of their day job — sharing their time and expertise to help move the Bay restoration forward. The members include representatives from federal and state government agencies, colleges and universities, and watershed organizations.

Even if an outcome does not have an indicator in place, there is still work under way. We make sure to highlight the latest and greatest from each workgroup in the *Bay Barometer*, to ensure their hard work does not go unnoticed. Examples include efforts to restore brook trout, track the status of state-identified healthy watersheds and help underserved communities that are vulnerable to flooding and other impacts

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Bold action needed to help striped bass

By Chris Moore

It's hard to find a Chesapeake Bay watershed resident whose eyes don't light up at the mention of striped bass, or rockfish.

For many of us, striped bass are a big reason we fell in love with the Bay and being on the water in the first place. But whether you love them for their fight, eating, or their critical place as an apex predator in the ecosystem, we can all agree that the Bay would be greatly diminished without this iconic fish.

That's why recent data showing warning signs for striped bass are extremely worrisome. The most recent scientific stock assessment, released in 2019 by the Atlantic States Marine Fisheries Commission, found that striped bass are overfished and the coastwide population is well below target levels. In the Chesapeake Bay, not only has there been a lack of legal-size fish, but there has also been below-average spawning activity the last two years. Meanwhile, the number of large, female fish has been declining for more than a decade.

There are multiple reasons striped bass populations are struggling. While overfishing is a serious problem, it's not the only one. Low-oxygen dead zones, driven by excess nitrogen and phosphorus pollution in the Bay, can stress striped bass and push them into warmer waters than they prefer, making them more susceptible to diseases like mycobacteriosis. Stress and injuries from being caught and released result in an unfortunately high number of dead fish each year. There are also concerns about the health of the population of menhaden, a primary prey species for striped bass, which are harvested by an industrial fishing fleet in the Bay.

On top of all of these stressors, changes in water temperature and rainfall patterns from



A 2019 stock assessment by the Atlantic States Marine Fisheries Commission found that the coastwide population of striped bass is well below target levels. (Dave Harp)

climate change are a growing concern for the Bay's striped bass population. Warmer waters may be leading to reduced spawning success, reduced growth of young striped bass and increased disease prevalence in the fish's population.

It's not too late to turn things around. Bold actions by the ASMFC and its members can successfully stem the decline and increase the striped bass population to healthy levels. After taking action last year to reduce the mortality of striped bass, the ASMFC is undertaking an extensive public engagement process to help shape a plan to set the course for striped bass management coastwide for the next decade or more. Robust public participation allows

data remain accurate and transparent.

Keep up to date on our progress at ChesapeakeProgress.com, and visit chesapeakebay.net/takeaction to learn how you can help. ■

Rachel Felver is the Chesapeake Bay Program communications director at the Alliance for the Chesapeake Bay.

everyone's voice to be heard and is critical for ensuring the best outcome.

We know it can be done because we've done it before. Striped bass populations plummeted in the 1970s and early 1980s, primarily from overfishing, but rebounded to historic levels by 2004 thanks to intensive conservation efforts from all stakeholders, including restocking programs and a particularly painful harvest moratorium in both Virginia and Maryland.

These efforts also included rigorous interstate management plans with specified fishing seasons, size restrictions and reduced bag limits, many of which remain with us in some form today.

This time around, we have the opportunity to avoid such drastic and costly measures as a moratorium and the need for restocking programs — the population is still approximately three times the size it was when the last striped bass moratorium was instituted — but only if those who use or manage this resource are willing to take bold action now to return the population to its target levels. ■

Chris Moore is the senior regional ecosystem scientist for the Chesapeake Bay Foundation.

LETTER TO THE EDITOR

Chesapeake doesn't need 'gold-plated tourism branding'

Tom Horton uses the term "national park" in his commentary, *Let's shore up efforts to make a Chesapeake national park* (January 2021). He also notes that "technically it is proposed as the Chesapeake Bay National Recreation Area," but readers could be left with the impression that there is little difference between a national park and an NRA. Nothing could be further from the truth. The administrative structure, land use controls, effect on existing activities, visitor traffic — all these and more can vary depending on an area's designation.

The "national park" title attracts many who are mainly interested in adding to their checklist of parks visited, with accompanying crowding and pressures to build increasingly elaborate infrastructure. Anyone who cares about the long-term preservation of an existing mixed-use area should prefer an NRA.

But even an NRA has pros and cons. The *Bay Journal* could serve its readers by explaining NRAs and what is envisioned for the Bay. Help us evaluate whether it will increase access to the Bay more than efforts already under way, while preserving and enhancing the Bay's ecosystem.

Horton writes that Joel Dunn of the Chesapeake Conservancy hopes for the "gold-plated tourism branding that being part of the nation's park system provides." Excuse me for believing that "gold-plated tourism branding" is the last thing the Chesapeake Bay needs.

*Charles Bethel
East New Market*

SHARE YOUR THOUGHTS

The *Bay Journal* welcomes comments and perspectives on environmental issues in the Chesapeake region. Letters to the editor should be 300 words or less. Opinion columns should be arranged in advance. Contact editor Lara Lutz at llutz@bayjournal.com or 410-798-9925. You can also reach the Bay Journal by mail at P.O. Box 300, Mayo, MD, 21106. Please include your phone number or email address.

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of climate change.

The efforts of our many partners to meet the outcomes of the *Chesapeake Bay Watershed Agreement* are on display each year in the *Bay Barometer*. It is a vital tool that helps the 18 million people who live in the watershed keep a pulse on Bay health and hold the Bay Program accountable for ensuring our

It may be time to reconsider nuclear energy options

By Bill Temmink

In his opinion column, *Where solar arrays shouldn't go is as critical as where they do go* (December 2020), Lee Epstein states that we should take care to only locate solar energy fields where they are appropriate.

First, he is absolutely correct. Careful placement of solar energy is a must to avoid damage to wildlife, arable land and the power grid itself. Further, he is correct that wise use of solar, combined with a laser-like focus on energy efficiency, may well be the energy-use transition strategy we need to get us to the next step in clean energy: nuclear. To be precise, new nuclear technologies.

Both solar and wind energy are renewable but have very large landuse footprints. They also have a fundamental flaw: They create energy on the timeline of nature, not the timeline of use. They rarely create the exact energy we need at exactly the time we need it. Energy storage technologies are not going to be available for systemwide use in time to make up for the variability of energy output from these two sources. For these reasons, they rely largely on fossil fuel for a backup. Thus, these renewable technologies may not be the right way to meet the Chesapeake Bay region's long-range goals for clean energy.

The term "renewable" energy caught on when there were serious concerns that we would run out of energy, particularly oil. For all practical purposes, that fear has been laid to rest. The larger problem we face today is not lack of energy, but too much atmospheric carbon from the use of energy. We should retire the term renewable and replace it with either "clean" energy or "zero-carbon" energy. By doing so, we open the field to revisit old energy technologies and examine new ones.

It is time we take a renewed look at nuclear power, both the second generation power plants that most folk envision when they think of nuclear and the newer nuclear technologies being tested and deployed today. First, nuclear plants in use today produce 100 to 2,000 times as much energy per acre as solar and wind do. While land use is not the only measure of energy efficiency, it is a measure in which nuclear power has always excelled. New nuclear technologies are even more land efficient.



Three Mile Island is a nuclear power plant on the Susquehanna River in Harrisburg. (Dave Harp)

Second, and to slay the elephant in the room, nuclear is both safer and cleaner than either wind or solar by any relevant measure. Feel free to do your own research on these points. What you find may surprise you.

Most residents of the Chesapeake region have not really revisited nuclear technology in decades. Fear, pretty much overblown fear, of the potential for nuclear plant disaster is what resides in the recesses of their minds. But despite that fear, nuclear power is by far the safest of any of the current energy technologies. By-and-large, though, people really do not accept this. I think the combination of the movie, *The China Syndrome*, with the meltdown of Three Mile Island is the last thing people really remember about nuclear power in the United States.

But this might be my personal view. The younger folks' fears of nuclear power are more likely driven by episodes of *The Simpsons*. Where else is there any public discussion of nuclear power? Nuclear power does not make news because it routinely and safely produces clean energy.

The last U.S. nuclear meltdown was Three Mile Island, more than 40 years ago. It resulted in no deaths, and only temporary evacuations. It also produced carbon-free energy for those 40 years. What other energy can make that claim?

Further, Three Mile Island was old

technology. The new technologies are safer, cleaner, likely cheaper and offer a variety of other benefits that no current technology can approach. Just to name a few of the side benefits of new nuclear: it can be used to create other clean fuels, create clean water, power industrial production and create medical isotopes currently in desperately low supply.

To start with safety, Benjamin Soon, of Flibe Energy, pointed out the how third- and fourth-generation nuclear power has redefined nuclear safety and created a new measure of energy safety. He uses the term, "probabilistic safety" to describe the state of most older nuclear reactors. Probabilistic safety is when the risk of a worst-case scenario is low, but the worst-case scenario is unacceptable. There has never been a worst-case nuclear disaster in the United States. Yet people still worry there might be.

The new standard for nuclear safety, he argued, should be "deterministic safety." Deterministic safety means that even the worst-case disaster is acceptable. It simply is not that bad. The plant might have to be shut down for a while, but there would be no possibility of a major explosion or radiation leak. The new nuclear technologies coming on-line today all are based on deterministic safety standards. They are, as they say, "walk-away safe."

Nuclear already provides most of the clean

energy today, both in the United States and around the world. It uses less resources than any other power technology, whether fossil-based or "renewable." It is safer than any other power technology. It is the only power technology where every ounce of its waste is stored and monitored. And, as it turns out, most of what has been considered nuclear waste is now finding a use in more advanced nuclear technologies.

The only real competitor to nuclear is water power, and more and more people are realizing how much environmental damage is done by damming rivers. This is especially a problem when, inevitably, silt deposited behind those dams reduces the volume of waters that the reservoirs can hold. Further, in the Chesapeake Bay region there are no more large flowing bodies of water to dam.

Epstein rightly points out that to create a megawatt of solar power you need roughly five to 10 acres of land. For the same amount of land, nuclear can create hundreds and, in some cases thousands, of times more clean energy. Further, new nuclear technologies can almost invariably be placed where old fossil fuel plants are being retired. This means, essentially, no land needs to be taken out of service. This has the added advantage that the power lines are already in place and land for new transmission lines do not have to be acquired.

Further, because nuclear plants can run steadily, little if any new land will be required for energy storage or to augment power lines for sporadic increases and decreases in electrical load. Last, but not least, new nuclear energy technologies promise to be at least 10 times more efficient than those of the current U.S. nuclear fleet. That eliminates the real reason nuclear power has not been building its foothold in the United States: cost.

In short, it is time to revisit the nuclear option for clean, zero-carbon energy. ■

Bill Temmink of Joppa, MD, is an environmental activist who began to reconsider nuclear energy after reading Superfuel: Thorium, the Green Energy Source for the Future by Richard Martin three years ago.

Russ Brinsfield was the quintessential farmer-scientist



By Tom Horton

“Think globally, act locally.” It’s hard to improve on that environmental dictum of uncertain origin. Have broad vision and context, but start solving problems where you live. Don’t wait on the world.

Russ Brinsfield personified this, and his passing this winter at 76 took one of the Chesapeake Bay’s best. This Eastern Shore farm boy spent his life in rural Dorchester County on Maryland’s Eastern Shore. His remarkably impactful career showed how humans can better live sustainably with the rest of nature. Few issues across this planet are more profound.

He worked at the scale of the Chesapeake; of his native Maryland; of Vienna, the local Nanticoke River village where he was mayor; and of the family’s 150-acre farm just north of town, where he was still growing grain when he died from complications of surgery.

Russ was a University of Maryland-trained scientist, an agricultural researcher who worked with Bay ecologists before such blending of “siloeled” disciplines became more common. He had the courage of his groundbreaking research, and he would often need it.

Forty years ago, Russ was finishing his ag Ph.D., borrowing an office at the university’s Horn Point research lab on the Eastern Shore. A generation of bright young ecologists there were pursuing a great mystery: What was killing the Bay’s underwater grasses? He was not part of that project, but when the Bay gurus needed to create a sizeable pond for their experiments, they found farmer Russ was handy with bulldozers.

Agriculture back then feared that

environmentalists would lay the blame for chemical water pollution solely at the feet of farmers. The rise of weed-killing chemicals on Bay farms had coincided with the demise of aquatic “weeds” — the Chesapeake’s vital seagrass habitats — which received runoff from millions of acres of farms.

Dr. Brinsfield was soon doing runoff studies at the fledgling University of Maryland Wye Research Institute, which he would direct for 34 years. He and colleague Ken Staver helped to largely exonerate farming’s herbicide use. But acting out of curiosity, without funding, they came to findings even more unsettling to Bay-region agriculture and, ultimately, worldwide.

Modern farming, they proved, was unexpectedly “leaky” when it came to the fertilizers nitrogen and phosphorus. These nutrients (also coming from sewage and dirty air) were washing off fields and killing Bay grasses, as well as creating “dead zones” devoid of oxygen in in the Bay’s deeps.

“It was a tense time ... the battle lines were drawn,” Staver recalled. “We were telling agriculture what it didn’t want to hear, but the numbers didn’t lie.”

I remember standing near Russ as a *Baltimore Sun* reporter in 1997. He was about to testify at a charged hearing that would show publicly how Maryland agriculture had failed to control polluting runoff. A superior was warning him: Don’t say anything “embarrassing to agriculture.”

Russ, as always, said what had to be said. But he and Staver were doing more than casting blame. They would develop a pioneering system of sowing winter “cover crops” on farms and ways to incorporate ubiquitous poultry manure into the soil, both measures that can dramatically cut nutrient pollution to the Bay.

And Russ, who was particularly adept at moving science through the political process, would go further still, helping to get millions of dollars annually to help farmers plant cover crops.

For many years I did a favorite field trip with Russ, who lived close enough that I could ferry my Salisbury University students there and back in one class period. We’d start in his barn and talk cover crops and pollution control, and about protecting



Russ Brinsfield, a scientist, farmer and mayor based in Dorchester County, MD, is shown here in his cornfield in 2006. (Dave Harp)

farmland from development, a subject Russ knew intimately. He inspired a critical study that showed rezoning farmland for less development did not depress property values.

Then we’d swing by his modest home, overlooking the Nanticoke River in little Vienna, where he’d do a second stellar presentation on “smart growth” — revitalizing towns and cities to keep development from sprawling across farms and other open spaces.

As mayor of Vienna, Russ was among the few leaders of small Eastern Shore towns to seize on the state’s smart growth money to redo sewage treatment systems, storm drains, sidewalks, lighting and shorelines. Vienna remains a work in progress, but Russ put his hometown in great physical shape for the 21st century.

He worked quietly, with no need for the limelight, befriending governors from Harry Hughes through Martin O’Malley, delivering tasty desserts to charm former Gov. William Donald Schaefer when he was state comptroller and sat on the powerful Maryland Board of Public Works.

And at the other end of the scale he remained rooted in the soil and culture of the place where he spent his life. Listen to Rob

Etgen, who has built the Eastern Shore Land Conservancy into one of the Chesapeake region’s champions of open space protection: “Russ co-founded [the conservancy] and spent countless hours riding with me to evening Farm Bureau meetings ... using his personal credibility to get me audiences with leaders of a skeptical farmer crowd.”

Russ was also one of the founders of the Harry R. Hughes Center for Agro-Ecology, designed to bridge the gap between agriculture and environment. He served as its director for 16 years.

Struggling in recent years with Parkinson’s disease, Russ would still meet with my Chesapeake Bay students, only asking of me, “help me out now if I miss a beat.”

He exemplified the very best of science, thinking globally, acting locally, with the skill and courage to translate research into action.

I guess I can still run that field trip, but it won’t be the same. ■

Tom Horton has written about the Chesapeake Bay for almost 50 years, including eight books. He lives in Salisbury, where he is also a professor of Environmental Studies at Salisbury University.



BULLETIN BOARD

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Citizen Science: Creek Critters

Use Audubon Naturalist's Creek Critters app to check a stream's health by identifying small organisms, then creating a report based on what is found. Get the free program at App Store or Google Play. Info: anshome.org/creek-critters. Learn about partnerships /host a Creek Critters event: cleanstreams@anshome.org.

VIRGINIA

Goose Creek Association

The Goose Creek Association, in Middleburg, needs volunteers to help with riparian buffer tree planting, stream monitor training. Info: info@goosecreek.org. Register: goosecreek.org/join-us.

Hoffler Creek

Hoffler Creek, in Portsmouth, needs program volunteers 10 a.m. to 4 p.m. each weekend in March. Volunteers with birding knowledge, experience interacting with children and families, communication skills, an interest in nature are needed to facilitate bird-related games, activities. Volunteers are stationed along the Kid's Trail to offer guidance, information. Info: 757-686-8684, hofflercreek.org.

Become a water quality monitor

Train online with the Izaak Walton League to become a certified Save Our Streams water quality monitor in Virginia. Follow up with field practicals, then adopt a site of your choice in Prince William County.



WORKDAY WISDOM

Make sure that when you participate in cleanup or invasive plant removal workdays to protect the Chesapeake Bay watershed and its resources that you also protect yourself. Organizers of almost every workday strongly urge their volunteers to wear long pants, long-sleeved shirts, socks and closed-toe shoes (hiking or waterproof). This helps to minimize skin exposure to poison ivy and ticks, which might be found at the site. Light-colored clothing also makes it easier to spot ticks. Hats are strongly recommended. Although some events provide work gloves, not all do; ask when registering. Events near water require closed-toe shoes and clothing that can get wet or muddy. **Always bring water.** Sunscreen and an insect repellent designed to repel both deer ticks and mosquitoes help. Lastly, most organizers ask that volunteers register ahead of time. Knowing how many people are going to show up ensures that they will have enough tools and supervisors. They can also give directions to the site or offer any suggestions for apparel or gear not mentioned here.

- *Snap a Stream Selfie:* Collect data on trash at a local stream by taking a photo.
- *Become a Salt Watcher:* Use a free, easy test kit to check if there is excessive road salt in a stream.
- *Check the Chemistry:* Spend 30 minutes at a local waterway with a handful of materials, downloadable instruction sheet.
- *Survey Stream Critters:* Identify what's living in a stream by matching pictures in an app. The number and variety of creatures reveal how clean the water is.
- *Monitor Macros:* Become a certified Save Our Streams monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess stream habitat, report findings, take action to improve water quality. Info: Rebecca Shoer at rshoer@iwla.org, 978-578-5238, or put "water quality va iwla" in your search engine.

Check out cleanup supplies

Hampton Public Libraries have cleanup kits to check out year-round, then return after a cleanup. Call your local library branch for details.

Cleanup support & supplies

The Prince William Soil & Water Conservation District in Manassas provides supplies, support for stream cleanups. Groups also receive an Adopt-A-Stream sign recognizing their efforts. For info / to adopt a stream / get a proposed site: waterquality@pwsxcd.org. Register events: trashnetwork.fergusonfoundation.org.

VA Master Naturalists

VA Master Naturalists are a corps of volunteers who help to manage, protect natural areas through plant & animal surveys, stream monitoring, trail rehabilitation, teaching in nature centers. Training covers ecology, geology, soils, native flora & fauna, habitat management. Info: virginiamasternaturalist.org.

Chemical Water Quality Monitoring Teams

Volunteers with the Prince William (County) Soil and Water Conservation District and Department of Environmental Quality Chemical Water Quality Monitoring Teams collect data from local streams. Training includes collection methods, reading data. Monitoring sites are accessible for easy collection. Info: waterquality@pwsxcd.org, pwsxcd.org.

PENNSYLVANIA

Middle Susquehanna River

There are many ways to get involved with the Middle Susquehanna Riverkeeper Association:

- *HERYN (Helping Engage our River's Youth with Nature):* Engage youth in outdoor activities.
- *Susquehanna Stewards:* Deliver programs & info to people in your region, help to develop new initiatives. Info: middlesusquehannariverkeeper.org.
- *Water Reporter App:* Help track the health of fish species in the Middle Susquehanna watershed by sharing photos, locations, other info about your catches via the app. Reports, an interactive map are available at middlesusquehannariverkeeper.org.
- *Share Concerns:* The Middle Susquehanna

Riverkeeper Association takes reports of any concern regarding the river, its tributaries very seriously. Hear of something out of the ordinary? Contact Riverkeeper John Zaktansky at 570-768-6300, midsusriver@gmail.com.

MARYLAND

Cromwell Valley Park

Opportunities at Cromwell Valley Park's Nature Center in Cockeysville:

- *Habitat Restoration Team / Weed Warrior Days!* 2–4 p.m. March 13, 27; April 10, 24; May 15, 29. Meet at Sherwood House parking lot. Remove invasive species, plant natives, maintain restored habitat. For this event, preregister with Laurie Taylor-Mitchell: Ltmitchell4@comcast.net.
- *Trail Guide Training:* 10 a.m.–12 p.m. March 24 (at CVP) & 25 (at Baltimore County Agriculture Center). Adults. Trail guides assist with school programs, special events, animal care. Training familiarizes volunteers with popular programs, CVP ecology. Coffee, tea provided. Bring water each day. New guides pay \$5 tuition fee.
- *Drop in Gardening!* 9 a.m.–12 p.m. March 27, April 10. Children's Garden. Ages 13+ Gloves, tools, water provided. Bring hat, sunscreen. Free.
- *Garlic Mustard Pull & Pizza:* 1–3 p.m. April 18. Ages 5+ Bring work gloves to pull this invasive weed. Try it on pizza baked in the earth oven. Fee: \$5.
- *Girl & Boy Scouts Day / Stream Cleanup:* 1–3 p.m. April 24. Ages 5–11 w/adult. Celebrate Earth Day by removing trash, debris from streams. Bring work gloves; wear boots/shoes that can get wet. Participants receive a CVP logo patch. *NO* siblings. Fee: \$5/Scout. *Ages 17 & younger must be accompanied by an adult. No walk-ins. Preregistration (online only) required for each program: cromwellvalleypark.campbrainregistration.com. Preregistration closes 4 p.m. Friday for weekend programs. Participants are required to sign a Baltimore County waiver of liability and COVID-19 waiver as part of the registration process. Info (including COVID-19 protocols): cromwellvalleypark.org, info@cromwellvalleypark.org, 410-887-2503. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.*

Free streamside buffers

Stream-Link Education is looking for Frederick County residents who own streamside or riverside property on 2 or more acres of land and are interested in joining a large-scale reforestation effort to protect the Monocacy River, its tributaries. Stream-Link raises funds through grant awards, corporate sponsorships to take on buffer planting projects at no cost to landowners and without restrictions (no easement required). Volunteers plant, maintain the forest for at least three years to ensure an 85% survival rate. Fill out form at streamlinkededucation.org/landowners. Info: streamlinkededucation.org/about, lisa.streamlink@gmail.com, 301-473-6844.

Mount Harmon Plantation

Help with manor house student tours, colonial crafts, hearth cooking, guided nature walks, the



Submission Guidelines

ONLINE

The *Bay Journal* website has a new look! It also has a new section called **Bulletin Board**, where you can log in and post your own events — and even include a photo. Visit bayjournal.com and click on "Bulletin Board."

IN PRINT

Because of space limitations, the *Bay Journal* is not always able to print every submission. Priority goes to events or programs that most closely relate to the environmental health and resources of the Chesapeake Bay region.

DEADLINES

The printed edition of **Bulletin Board** contains events that take place (or have registration deadlines) on or after the 11th of the month in which the item is published through the 11th of the next issue. Deadlines run at least two months in advance. April issue: March 11
May issue: April 11

FORMAT

Submissions to **Bulletin Board** must be sent either as a Word or Pages document or as text in an e-mail. Other formats, including pdfs, Mailchimp or Constant Contact, *will only be considered if space allows* and information can be easily extracted.

CONTENT

You must include the title, time, date and place of the event or program, and a phone number (with area code) or e-mail address of a contact person. State whether the program is free or has a fee; has an age requirement or other restrictions; or has a registration deadline or welcomes drop-ins.

CONTACT

Email your submission to kgaskell@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.



BULLETIN BOARD

herb garden at Mount Harmon Plantation in Earleville. Special event needs include house tours, admission/ticket sales, gift shop, auction & raffle fundraisers. Training provided. Docents are asked to commit to eight service hours per month during tour season: 10 a.m.–3 p.m. Thursdays to Sundays, May to October. Info: 410-275-8819, info@mountharmon.org.

Report a fish kill

If you see a fish kill, call the Maryland Department of Environment's Fish Kill Investigation Section. Normal work hours: 443-224-2731, 800-285-8195. Evenings, weekends, holidays: Call the Chesapeake Bay Safety & Environmental Hotline: 877-224-7229.

Breeding Bird Atlas project

Help the Breeding Bird Atlas of Maryland & the District of Columbia, a five-year project documenting the distribution, abundance of local breeding bird populations by looking for nests in backyards, forests. Data are used to manage habitat, sustain healthy ecosystems. Info: ebird.org/atlasmdcc/about.

Severn River Association

The Severn River Association is looking for people to tell the Severn's story. Writers, photographers, reporters, memoirists, editors are needed to record tales of the river's wildlife, people, forests, history, culture, sailing. SRA can create internships for journalists of all ages who want to tell a story, cover meetings, pictures. Info: info@severnriver.org. Put "volunteer" in the message box.

Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation remove invasive plants 10 a.m.–4 p.m. the second Saturday in March, April and May at Ruth Swann Memorial Park in Bryan's Road. Meet at Ruth Swann Park-Potomac Branch Library parking lot. Bring lunch. Info: ialm@erols.com, 301-283-0808 (301-442-5657 day of event). Carpoolers meet at Sierra Club Maryland Chapter office at 9 a.m.; return at 5 p.m. Carpool contact: 301-277-7111.

Chesapeake Bay Environmental Center

Help the Chesapeake Bay Environmental Center in Grasonville. Drop in a few times a month or more frequently. Help with educational programs; guide kayak trips & hikes; staff the front desk; maintain trails, landscapes & pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; participate in CBEC's team of wood duck box monitors & other wildlife initiatives. Other opportunities include fundraising, website development, writing for newsletters & events, developing photo archives; supporting office staff. Volunteers donating more than 100 hours of service per year receive a free one-year family membership to CBEC. Info: volunteercoordinator@bayrestoration.org.

Chesapeake Biological Laboratory

Help at Chesapeake Biological Laboratory's Visitor Center on Solomons Island. Volunteers, ages 16 & older, must commit to at least two, 3–to 4-hour shifts each month in spring, summer, fall. Training required. Info: brzezins@umces.edu.

Citizen Science: volunteer angler survey

Help the Department of Natural Resources collect species, location, size data using its *Volunteer Angler Survey* on a smartphone. Data help to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad & striped bass programs also have mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Patuxent Research Refuge

Volunteer at the Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Open & close the store, help customers, operate the register. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.

Backyard Buffers program

The Maryland Department of Natural Resources is offering free tree seedlings to landowners in several counties who have a creek, drainage ditch, stream or other waterway on or near their property. Each "buffer in a bag" contains 25 native bare-root tree, shrub seedlings with species appropriate to each region. Limited quantities; reservations taken on first-come, first-served basis. County contacts:

- *Allegany / Adam Miller*: 301-777-5590, adam.miller@maryland.gov. Online, preferred: forms.gle/9Jz8CrbJbuhqUJF8. Reserve by March 19.
- *Anne Arundel / Justin Arseneault*: 410-360-8421, justin.arseneault@maryland.gov, aawsa.org/backyard-buffers.
- *Baltimore County / Rob Prenger*: 410-665-5820, rob.prenger@maryland.gov.
- *Calvert / UMD Extension Service*: 410-535-3662, calvertmg@umd.edu.
- *Caroline & Talbot counties / Jim Harris*: 410-479-1623, jim.harris@maryland.gov.
- *Carroll / Jamie Weaver*: 410-848-9290, jamie.weaver@maryland.gov. Online: form.jotform.com/203386061876158.
- *Cecil / Tom Frederick*: 410-287-5777, tom.frederick@maryland.gov.
- *Dorchester / Scott Daniels*: 410-228-1861, scott.daniels@maryland.gov.
- *Frederick / Sean Weaver*: 301-791-4010, sean.weaver@maryland.gov. Online: forms.gle/HPqGfn3JdSN1BRPP8) Reserve by March 19.
- *Garrett / Melissa Nash*: 301-334-3296, melissa.nash@maryland.gov. Online, preferred: forms.gle/9Jz8CrbJbuhqUJF8. Reserve by March 19.

- *Harford / Andrew Amoruso*: 410-557-4587, andrew.amoruso@maryland.gov.
- *Howard & Montgomery counties/ James Eierdam*: 410-442-2080, james.eierdam@maryland.gov.
- *Kent & Queen Anne's counties / Dan Small*, Washington College, 410-708-4479, dsmall2@washcoll.edu. *OR Chip Broadwater*: 410-490 1284, chip.broadwater@maryland.gov. Online: washcoll.co1.qualtrics.com/jfe/form/SV_bfNB7KAGjsKwcQd. Reserve by April 1.
- *St. Mary's / Nicole Basenback, UMD Extension*: 301-475-4484, nicoleb@umd.edu. Online: go.umd.edu/BackyardBuffers2021.
- *Somerset / Luke Marcek*: 410-651-2004, lucas.marcek@maryland.gov. Reserve by April 16; pickup April 17.
- *Washington / Robert Schwartz*: 301-791-4733, robertr.schwartz@maryland.gov. Reserve by April 1; pickup April 10.
- *Wicomico/ Wilfred Dyer*: 410-543-1950, will.dyer@maryland.gov.
- *Worcester/ Mary Bohlen*: 410-641-4314, mbohlen@berlinmd.gov. Reserve by April 16; pickup April 17.

CONFERENCES

MARYLAND

Delmarva climate issues workshop

Eastern Shore Land Conservancy, as part of its *Solutions for a Changing Delmarva* virtual workshop series, is presenting *How You Can Make An Impact In Your Community* 6 p.m. March 16. Learn about tools to combat climate change and build resilience. An activity designed to establish a personal connection will be broadcast over social media channels to provide students, teachers, Delmarva residents with fun opportunities to learn how sea level rise and climate change affects their community. Free. Register to receive a link to participate: eslc.org/events/. Info: Tyler Chandler at tchandler@eslc.org.

EVENTS / PROGRAMS

WATERSHEDWIDE

Horn Point Lab seminar series

The University of Maryland's Center for Environmental Center for Science's Horn Point Lab spring seminar series, *The Universe to*

Unicellular & Everything in Between, will take place virtually. Listen to leading scientists as they explore the environment through the lens of their field of research. The Zoom webinars, which take place at 11 a.m., are free and open to the public. Register to receive a link: umces.edu/hpl. Upcoming topics include:

- *Exploring Black Lives Matter & the Criminal Legal System as Environmental Justice Challenges*: March 24. David Pellow, University of California Santa Barbara.
- *Chasing Down the Storm - Understanding the Atmosphere's Science, Caprice & Beauty*: March 31. Matthew Cappucci, *Washington Post*.
- *Using NASA Earth Observations & Google Earth Engine to Map Winter Cover Crop Conservation Performance in the Chesapeake Bay Watershed*: April 7. Alison Thieme, University of Maryland, College Park.
- *Applying Environmental Epigenetics to Non-Model Marine Organisms*: April 14. Jose Maria Eirin-Lopez, Florida International University & Hollie Putnam, University of Rhode Island.

Learn to grow an oyster garden

The Chesapeake Bay Maritime Museum in St. Michaels will be presenting a hybrid virtual and in-person workshop on growing oysters. In the Zoom class, 6–7 p.m. March 18, participants learn the practical aspects of oyster gardening, why oysters are so important for the Bay's health. Participants are then invited to CBMM 10 a.m.–12 p.m. March 20 to learn how to grow oysters off their own dock and build three oyster cages, which they will take home along with seed oysters and necessary components to start their own oyster garden. Register for just the virtual program for \$25 or both sessions for \$200. Info / registration: cbmm.org/oystergarden.

Virtual native landscape program

Gardeners who would like suggestions for what to plant where are invited the Manada Conservancy's virtual program, *Native Plants in Your Landscape*, 7 p.m. April 8. Several native plant experts will share ideas & tips, answer questions. Free Register: manada.org/events. Info: office@manada.org, 717-566-4122.

See **BULLETIN**, page 40



CHESAPEAKE CHALLENGE

ANSWERS

Here's a peep at the pond's pop star
on page 41

1. C 2. C & D 3. B 4. B 5. A 6. C 7. Tadpole 8. A



BULLETIN BOARD

BULLETIN, from page 39

VIRGINIA

Virginia Living Museum Ice Age Exhibit

Extinctions are not just historical events, they are also happening right now. The Virginia Living Museum in Newport News, VA, unearths extinctions of the past to consider the future of Earth in its temporary exhibit, *Exploration Ice Age: Unearthing Extinctions*, 9 a.m.–5 p.m. through April 11. The exhibit showcases fossils, mammoths, saber-toothed cats and other animals of the last Ice Age during the Quaternary Period at the end of the Pleistocene Epoch, when North America's megafauna went extinct. It also connects ancient species to their modern-day relatives, some of which live in habitats on the museum's 0.75-mile outdoor trail. An interactive fossil discovery quest includes a digital breakout room via QR code in which guests, using a mobile device, select a fossil on display, then "travel back in time" to solve clues to discover its identity. All COVID-19 guidelines will be enforced both indoors and outdoors. Fee: included w/ museum admission (\$20 / ages 13+; \$15 / ages 3–12 and free / ages 2 & younger). Info: thevlm.org, 757-595-1900.

PENNSYLVANIA

Spring Native Plant Sale

The Manada Conservancy's *21st Annual Spring Native Plant Sale* online store is open and features more than 100 varieties of perennials for sun & shade, hard-to-find specialty natives, grasses, shrubs, trees. Shop at manada-conservancy.square.site through April 20; pick up on May 1 at Boro Park in Hummelstown. Info: office@manada.org, 717-566-4122.

MARYLAND

Maryland Day

Commemorate the first landing of the colonists on St. Clement's Island and celebrate Maryland's founding at its birthplace 10 a.m.–5 p.m. March 25 at St. Clement's Island Museum in Colton Point. Admission to the museum and water taxi rides to St. Clement's Island State Park are free this day. In light of the COVID-19, this year's ceremony is virtual. Visit the museum's Facebook page at 12 p.m. to view a video produced just for 2021. Info: 301-769-2222, museums.StMarysMD.com, facebook.com/SCIMuseum.

Cromwell Valley Park

Programs at Cromwell Valley Park's Nature Center in Cockeysville:

■ *Nature Quest Hop Along*: 1–2:30 p.m. March 14. All ages. Get an early start on your 2021 Nature Quest Passport. Bring your own "Parker the

Frog" to visit CVP's Nature Quest Markers. Free. Info on Parker the Frog: baltimorecountymd.gov/departments/recreation.

■ *To Bee or not to Bee*: 1–2:30 p.m. March 20.

Ages 5+ Learn about native species. Build a nesting can to create habitat for these low-maintenance insects in your yard. Fee: \$5.

■ *Nature Quest Night Hike*: 7–8:30 p.m. March 26. Ages 8+ Locate CVP's Nature Quest markers. Bring a Wegman's Nature Quest Passport Booklet (or pick one up at the Nature Center). Wear sturdy shoes. Fee: \$5.

■ *Bird Walks*: 8–10 a.m. March 27; April 3, 10, 17, 24; May 1, 8, 22, 29. Meet at Willow Grove Gravel Parking Lot sign. Ages 14+ Free.

■ *Scrambled Eggs*: 1–2:30 p.m. March 27. All ages. Discover the different egg masses in our ponds. Wear waterproof boots. Fee: \$4.

■ *A Walk in the Park*: 1–2:30 p.m. March 28. All ages. Wear sturdy shoes. Fee: \$4.

■ *Natural Dyes*: 1–3 p.m. April 3. Ages 5+ Learn to make dyes from plants, animals, minerals. Bring 12 hard-cooked eggs. Fee: \$5.

■ *Self-Guided Easter Trail Hunt*: 11 a.m.–3 p.m. April 4. All ages. Pick up a booklet for self-guided hike. Return to center for prize. Fee: \$4.

■ *Critter Craft*: 1–2 p.m. April 10. All ages. Meet one of CVP's animals, make a critter craft to take home. Fee: \$4.

■ *Water, Water, Everywhere!* 1–2:30 p.m. April 11. Ages 5+ Use nets to learn about the park's streams. Boots/shoes will get wet. Fee: \$4.

■ *Adult Garden Club*: 8:30–10:30 a.m. Mondays, April 12 to Oct. 25 or Thursdays April 15 to Oct. 28. Children's Garden. Adults. Like to garden but don't have space/deer-proof fence? Grow your own vegetables, herbs, flowers at CVP; tend to shared garden plots. CVP provides seeds, seedlings, tools. Attend one or both days each week, but register for *ONE* session only. Fee: \$50.

Ages 17 & younger must be accompanied by an adult. No walk-ins. Preregistration (online only) is required for each program: cromwellvalleypark.campbrainregistration.com. Preregistration closes 4 p.m. Friday for weekend programs. Participants are required to sign a Baltimore County waiver of liability and COVID-19 waiver as part of registration process. Info (including COVID-19 protocols): cromwellvalleypark.org, 410-887-2503, info@cromwellvalleypark.org. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

Ladew Topiary Gardens

The Spring Lecture Series at Ladew Topiary Gardens in Jarrettsville returns this year in a virtual format. Talks include:

■ *Return of the Periodical Cicadas & Other Garden Pests*: 4 p.m. March 17: Mike Raupp, professor emeritus at the University of Maryland and a fellow of the Entomological Society of America, will discuss the Brood X periodical cicadas, which return by the trillions this spring

from Georgia to New York with Maryland at the epicenter. Learn about their survival strategy, impact on the landscape. He will also discuss how to fight the invasive spotted lanternfly.

■ *Gardens in Small Spaces*: 11 a.m. March 31. Award-winning garden designer Butter Wakefield will share examples that illustrate how to use limited space efficiently to maximum effect, including how to create an illusion of space. *Lectures will be presented virtually through Zoom for paid registrants. Fee per session: \$20. Info: Sheryl Pedrick at 410-557-9570 x226, spedrick@ladewgardens.com.*

Chesapeake Bay Maritime Museum

The Chesapeake Bay Museum in St. Michaels, invites students, grades 6–9, to take part in its *Rising Tide Program*, 3:30–5:30 p.m. Tuesdays & Thursdays (in-person) and 3:30–5:30 p.m. Wednesdays (virtual). Both versions of the program offer challenging projects that build skills in design, woodworking, project management. Virtual projects subject material is different from in-person classes; participants may sign up for either or both. Info / registration (required): cbmm.org/risingtide, risingtide@cbmm.org. In-person participants must wear facial coverings inside buildings at all times and outdoors when within 6 feet of other guests. Info: welcome.cbmm.org.

VIRTUAL EXPERIENCES

Middle Susquehanna River podcasts

The Middle Susquehanna River Association has compiled a library of podcast interviews with outdoor influencers from throughout the watershed. Guests speakers include:

■ The Foundation for Pennsylvania Watersheds' John Dawes discusses how his agency helps small watershed groups, the dangers of acid mine drainage, fracking, other waterway concerns.

■ ProtectNorthernPA.org founder Diana Dakey discusses concerns about the production, transportation of liquified natural gas.

■ Teen kayaker and angler Lila Oast discusses how kayaking has opened doors for her.

■ Outdoor educator Jon Beam and Audubon member Gary Metzger discuss threats that the watershed's duck species face.

■ Renee Carey of the Northcentral PA Conservancy discusses the importance of preservation, public access.

■ Benjamin Hayes, director of Bucknell University's Watershed Sciences & Engineering Program discuss the health of the Middle Susquehanna River.

■ Salmon angler Steve Kurian discusses the benefits of clean water.

■ Educator Van Wagner discusses his *Eels in the Classroom* program, the importance of eels.

■ Waterkeeper Alliance Executive Director Marc Yaggi discusses growing up in the Middle

Susquehanna watershed, his quest in the fight for clean water.

■ Outdoor educator Jolene Connelly discusses the importance of getting youth, women on waterways.

■ Diving instructor Rich Best discusses trends, treasures, threats underwater in the Susquehanna.

■ Pennsylvania Organization for Watersheds and Rivers spokesperson Tali MacArthur discusses the importance of assisting a watershed group.

■ Falconer Mike Dupuy discusses the raptors of the Middle Susquehanna River, threats they face.

■ Fish & Boat Commission spokesman Mike Parker discusses the agency's efforts during COVID-19 pandemic, historic unexpected start to trout season.

■ Wesley Forest Camp Director Emily Sliski will share stories of getting young people engaged with nature at camp, on the Penns Creek.

■ Professional angler and YouTuber John Oast discusses how he got his start, what he has learned along the way and observations of the river.

■ Biologist David Lieb discusses the concerning trend of exotic crayfish eradicating native species in the watershed, how it is impacting the ecosystem.

To access the podcasts, put "middle susquehanna river podcasts" in your search engine.

Tour Maryland parks

Learn about history and nature highlights — Harriet Tubman's story, corn snakes, a wildflower hike — while taking a virtual tour of Maryland's state parks. To view one of the 29 videos, put "MD DNR virtual park tour" in your search engine, go to DNR Offers Virtual State Park Tours LexLeader, follow the instructions.

Connect with nature

The Maryland Department of Natural Resources is providing an assortment of free, low-cost programs for various grade levels. To learn about birds, bees, scat, leaves, nature journals, put "MD wildlife education resources" in your search engine. To learn about what a park ranger does, put "Maryland Junior Ranger Program Maryland DNR" in your search engine.

Wayback Wednesdays

St. Mary's County (MD) Museums are bringing history to people who are unable to visit them during the COVID-19 pandemic. Their weekly video series, *Wayback Wednesdays*, features everything from the quirky to the fascinating in the county's history. At present, there are more than 30 titles in the series, including: *Horse Racing in Leonardtown, The Old Jail & the Underground Railroad, John Donahoo & the Lighthouses of St. Mary's County and The Pony Express & U.S. Postal Service in St. Mary's County*. Visit facebook.com/watch/SCIMuseum/817869892069064/.



— Kathleen A. Gaskell



Here's a peep at the pond's pop star

The northern spring peeper is the most widespread of the chorus frogs in the eastern United States and Canada. How widespread is your knowledge about this springtime serenader? Answers are on page 39.

- A single peeper sounds like a chick. What does a choir of spring peepers sound like?
 - Backup horns on vehicles
 - Fingernails on a chalkboard
 - Jingle bells on a leather harness
 - Trumpet blurts
- Wooded areas near swamps and ponds (vernal or permanent) are prime peeper mating habitat. Where is a peeper most likely to be calling from? Pick two.
 - Middle of the pond/water
 - Muddy depression
 - Tree overhanging the water
 - Waterside shrub
- Although the peeper prefers to stay on the forest floor, it is the only chorus frog in the watershed that climbs trees, thanks to large sticky pads on its toes. When they climb a tree, what is the general height limit?
 - 2 feet
 - 3 feet
 - 4 feet
 - 5 feet
- Early in the breeding season (March to June), a peeper may do something it doesn't do the rest of the year. What?
 - A hoppy mating "dance"
 - Peeps during the day
 - Eats berries to keep its voice sweet
 - Swims upside down to show off its vocal sac
- A male peeper sings to attract females to its breeding territory, which is only 4–16 inches in diameter. Females prefer larger older males. How can they tell who's who?
 - Older males peep faster.
 - Older males peep more slowly.
- Chorus frogs' backs are marked with spots or stripes. What is on the back of a spring peeper in some form (and is the source of its Latin species name, *crucifer*)?
 - Broccoli-shaped blobs
 - Bull's-eyes
 - Cross-shaped mark
 - There are no patterns
- Which is longer, a northern spring peeper tadpole or adult?
 - It produces a form of glucose and "freezes" itself while hibernating, returning to normal when temperatures rise.
 - Its skin produces a hard shell that keeps the cold out.
 - It eats a lot of fireflies in the fall, which keeps the frog warm all winter.
 - It surrounds itself with many layers of leaves, forming insulating "peeper balls" that can be as wide as 1.5 feet.



Songsters will trill you to pieces

Go outside on a March night after temperatures have been in the 50s for a few days. If you are near a wet area, you are likely to hear the "lusty" chirping of one of the Chesapeake Bay watershed's four chorus frog species — the southern chorus frog, upland chorus frog, New Jersey chorus frog and northern spring peeper — looking for love.

Boys in the band: Among the Bay species, only male chorus frogs sing. They are trying to attract females.

Little big mouths: Chorus frogs in the Bay watershed are no larger than 1.25 inches long. Yet their singing can be heard from as far away as 2.5 miles, depending on their numbers.

What's for grub? Chorus frog tadpoles eat algae and other microorganisms. Adults eat ants, gnats, flies, beetles, spiders, worms — and grubs.

No breathy singing here: Human singers learn to control their breathing so it doesn't interfere with their singing. This is not an issue for frogs, which breathe through their skin, as long as there is enough oxygen in the water. (Tadpoles breathe through gills, which are lost when they turn into adults.)

Don't jump to conclusions: Although local chorus frogs are in the *Hyllidae* (tree frog) family, only the northern peeper actually climbs trees. Although chorus frogs can jump, they mostly walk.

Find Froggy! Between their small size and nocturnal habits, you are more likely to hear a chorus frog than see one. The best places to look are ponds (both vernal and permanent), grassy wet meadows, and damp leaf litter in woods and swamps.

How deep is the pond? Knee-deep, knee-deep.

Peeper icon: Ryan Hagerty / USFWS

A. The peeper's genus name, *Pseudacris*, means "false cricket." (Well Tea / CC BY-SA 2.0)

B. The markings on a spring peeper help it to blend into the bark of trees and leaf litter. This helps it hide from predators such as birds, salamanders, snakes and spiders. (Wikimedia Commons / USGS)

C. The peeper's vocal sac, like this one in a vernal pond in Kings Gap State Park in Carlisle, PA, balloons out as it sings to attract a mate. (Will Parson / Chesapeake Bay Program)

Conservation collaboration: Many hands make light tree-planting



STEWARD'S CORNER

By Adam Miller

At one end of a field, nearly 40 volunteers gathered around a single tree. Nearby, the chatter of a swift-moving creek did its best to drown out the directions coming from our instructor. It was almost as if the stream had come to life in anticipation of the morning's event. Across the field sat 2.6 acres of freshly dug holes, and next to each a sapling, stakes and plastic trunk guard. With our tree-planting instructions complete and roles assigned, the volunteers took to the field, tools in hand.

Planting 500 trees in one day sounds like a daunting task. On your own, you would need to plant one tree every 173 seconds for 24 hours straight. But on this beautiful October morning, with a team of motivated volunteers on the job, we had the final tree in the ground in less than two hours. Many hands make light work; that's one of the beautiful things about partnerships. The practical benefits of inclusive collaboration are plentiful, and we know that all too well at the Alliance for the Chesapeake Bay.

The groundwork for the project at hand kicked off months earlier with the help of the Muddy Creek Chapter of Trout Unlimited in southern Pennsylvania. The chapter had identified a small local stream in need of a wooded buffer. The owner of the property adjacent to the creek, Tim White, had not only given his permission for the tree planting, but also showed up to help when our platoon of volunteers arrived.

Local Trout Unlimited chapters are intimately attuned to their watersheds. Their passion for the health of local streams and rivers positions them as ideal partners to identify specific needs and establish relationships.

"Riparian buffer zones are a vital ecological tool for maintaining good water and making sure we have cold, clean water and good habitat for fish," said Jim O'Connor, president of the Muddy Creek chapter.

"When we found this location, we knew we were in the right spot. The Whites have



About 40 volunteers from the Muddy Creek Chapter of Trout Unlimited teamed up one day last fall to plant a 500-tree riparian buffer along a trout-friendly creek in southern Pennsylvania. (Adam Miller / Alliance for the Chesapeake Bay)

been incredible partners, and their commitment to doing the right thing with the land is so important."

With a site identified, the Alliance stepped in to identify landowner objectives and provide a holistic reforestation plan. Our plans often include funding, buffer design, tree species selection and purchase, planting expertise and developing a long-term maintenance plan.

As the forest of saplings grows, gradually putting its roots deeper and deeper, it will reduce sediment in the water by stabilizing the stream bank and filtering stormwater runoff. The trees also decrease the creek's overall temperature by providing shade and slowing down stormwater headed for the creek. It's an integrated plan focusing on the long-term sustainability of the forest, stream and the wildlife that depend on these healthy habitats.

"I think it's a huge investment in the long-term value of this property," White said. "These trees are going to protect this stream for years and years to come, and it's a tremendous example to my grandchildren of a commitment to the land."

The symbiotic relationships that occur when people from a variety of backgrounds come together are powerful. Not only do our upstream efforts improve the water quality of the larger creek, river and Bay downstream, they also affect the community in ways that are sometimes hard to quantify. Riparian buffer plantings create

opportunities for volunteers to connect not only with nature but also with like-minded individuals. Engaging in outreach opportunities, especially with youth, is a critical step toward developing long-term support for conservation.

"My 13-year-old son, Aiden, is a passionate angler with a desire to connect with and learn from mentors in our community," planting volunteer Cara Mattlin said. "As a result of our volunteer efforts, Aiden received permission to fish on the property, was given a fishing rod from another volunteer and became aware of Trout Unlimited's Rivers Conservation and Fly Fishing Youth Camp. He got to see what it looks like to take care of the land and made some potentially life-changing connections."

As a local conservation partner within the Chesapeake Bay watershed, Muddy Creek Trout Unlimited has mounted an aggressive campaign to impact the lives of young members of the community with its Trout in the Classroom program. The organization estimates that approximately 2,000 students from third-graders through high school seniors have learned about, cared for, raised or released trout over the last five years. Through the combined efforts of the Pennsylvania Fish and Boat Commission, school teachers and the Trout Unlimited chapter, these students develop early connections with the watershed where they live, work and play.

Partnerships like this are a foundational

element of the Alliance for the Chesapeake Bay. From its very beginnings, the Alliance has been creating connections and uniting diverse audiences through common goals. Local organizations, volunteers, landowners and communities, as well as streams, rivers, the Bay and the wildlife that requires clean water to survive, all benefit from our collective approach to conservation.

As we celebrate our 50th anniversary, we also celebrate the partnerships that have shaped us, assisted in our accomplishments and bolstered our momentum. It's with that energy that we leap into the next five decades of conservation. As a community, we have achieved so much, but there is much more to do — with no time for hesitation. We must continue to unite the 18 million individuals that call the Bay watershed home.

We encourage you to get involved. Much like the unforeseen opportunities that come from our partnerships, you never know what you may find waiting for you at your next community cleanup, tree planting or local meeting. ■

Visit allianceforthebay.org/stewardscorner to watch a video of the event, learn about upcoming events and volunteer opportunities, and find your local Trout Unlimited chapter.

Steward's Corner is a column from the Alliance for the Chesapeake Bay. Adam Miller is the communications director for the Alliance for the Chesapeake Bay.

Hooded mergansers' bird's-eye view is for depths, not heights



By Mike Burke

At first, I didn't see the ducks because of all of the Canada geese on the lake. Our small resident population of Canadas was dwarfed by 150 or so of their migrating cousins, all crowded onto the surface of the 6-acre water body. The sporadic honking and constant movement made it difficult for me to focus my attention. Then, suddenly, there they were: half a dozen diminutive hooded mergansers, clustered directly in front of me.

There were four of the dramatic males and a pair of females. All of the males had erect crests, with a very large, very white, fan-shaped patch on each side. How had I missed these eye-catching birds?

Hooded mergansers (*Lophodytes cucullatus*) are among our smallest ducks, but they are also among the most visually striking. The male's flamboyant fan crest gives the head an oversized effect. When the crest is relaxed, it flattens out and points backwards, making the white patch more of a thick horizontal stripe. There's no mistaking a male in breeding plumage. Rounding out its face are a thin, ebony bill and yellow eyes. Chestnut sides sit below a black back and above a white belly.

The female also has a crest, but it's a rusty brown, poorly defined, and extends more backward than straight up. Like the male, the female has the thin bill typical of mergansers. She's got a white belly, but the rest of her is a cryptic blend of grays, blacks and browns. Her eyes are brown, tending toward orange.

Hooded mergansers are diving ducks. Their legs are set far back, making them clumsy on the ground. But these ducks are graceful under water, where they use their feet for what they're built for — propulsion.

Their thin, serrated bills are perfect for capturing slippery fish, which are an important food source. Unlike other mergansers, hoodeds have a varied diet that also includes crayfish, aquatic insects, snakes and amphibians.



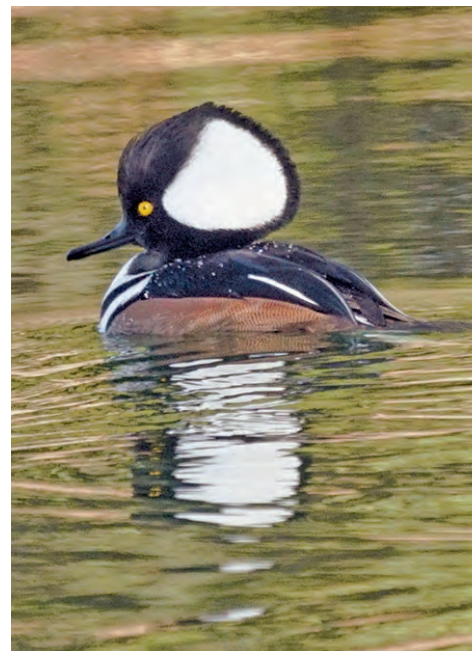
During winter, hooded mergansers congregate on brackish bays and tidal rivers, where the saline waters resist freezing and the ducks can continue to dive for food. In the summer, they usually breed on smaller lakes and rivers. Hooded mergansers nest in cavities; most use natural openings in trees, but the species will readily use artificial nesting boxes.

The female selects the site, but doesn't improve it. She uses the old nest or even a pile of wood chips in the bottom of a nesting box. Hens lay five to 13 eggs and incubate them 26–41 days. Despite eggs being laid over a two-week period, the chicks emerge together, a phenomenon called synchronous hatching.

Hooded mergansers practice brood parasitism — that is, females often lay eggs in others' nests. The unwitting adoptive mother doesn't do the math and can be counted on to incubate the extra egg. The practice appears to be widespread, but ornithologists can't be very precise about that because they have the same challenge as the surrogate moms: All of the eggs look alike, so it's hard to tell if they all belong to the nest occupant.

Despite the confusing mix of eggs, hooded mergansers have a good record of successful nesting. Their population is thought to be growing modestly.

Ducklings leave the nest after a single day. They bravely jump from the nest hole to the ground. Amazingly, the tiny fluff balls may bounce once or twice when they hit the forest floor, but they emerge without injury. As soon as the group is assembled, the mother



Above: A quartet of hooded mergansers cruises on a lake, the males easy to spot with their oversized crests and white cheek patches. (Mike's Birds / CC-BY-SA 2.0)

Left: Hooded mergansers are one of the smallest ducks, measuring 15.8–19.3 inches long and weighing 16–31 ounces. (U.S. Fish & Wildlife Service)

underwater vision is blurry because water is refractive — it bends the light — and our corneas can't adjust to the refraction and therefore can't keep the focus sharp on the retina. (Refraction in water is also the reason why a spoon in a glass tumbler appears to be broken at the surface.) The merganser's eyelid, though, corrects water's distortion and even magnifies the bird's vision. The result is especially well-adapted eyesight for an underwater hunter.

Vision is a funny thing. I had been alerted to the presence of the ducks by a friend. But when I went looking for the hooded mergansers on the lake, initially there was too much visual stimuli for me to “see” the birds. Once I focused on them, though, they were plain as day.

Often, I feel like I could use an extra set of eyelids. I need a set that filters out the extraneous stimuli that sometimes overwhelms me in today's complicated world. I'd give up fancy headwear for that attribute any day. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

Using nature to shore up coasts, communities from storms



By Kathy Reshetiloff

After Hurricane Sandy mauled the Atlantic Coast in October of 2012, scientists and conservationists have been working to “strengthen” the shoreline and make it more resilient in the face of major storms. The Hurricane Sandy Coastal Resilience Program, led by the U.S. Fish and Wildlife Service, involves countless federal and state agencies, as well as local and regional conservation groups.

Most of these coastal resilience projects are aimed at strengthening nature — restoring ecosystems that naturally withstand and recover from the inland and coastal flooding that has become more common because of rising seas, stronger storms and heavier precipitation. From marsh, beach or dune restoration to living shoreline installations, green infrastructure and “aquatic connectivity” projects, all of these are designed to benefit both wildlife and people.

Marsh restoration

Marshes provide important nursery, foraging and refuge habitats for many commercially and recreationally important species of fish and crustaceans, building the capacity of these systems to persist into the future. Enhancing marsh vegetation cover and growth, reducing invasive plant species and improving hydrological functions provide better habitat for birds, fish and other wildlife. Marshes also protect our communities. By absorbing waves and reducing storm surges, marshes can reduce flooding and coastal erosion.

Living shorelines

Living shorelines rely on natural habitats and structures on the coastline, as opposed to hard structures, to protect shoreline communities and habitats. Living shorelines protect adjacent habitats like beaches and marshes, and they help to promote the shallow water habitat needed to support oysters and Bay grasses. The natural vegetation of living shorelines reduces coastal erosion for



This aerial view shows how wetlands provide a buffer to Nanticoke River communities. in Maryland. (Matt Rath / Chesapeake Bay Program)

nearby communities and is at least as cost effective as “hardened” coastal infrastructure, such as stone revetments.

Aquatic connectivity

Projects that improve aquatic connectivity include reconnecting rivers and creeks to their floodplains, removing dams, improving or replacing culverts or bridges, and improving riverine and streamside habitat for aquatic life and other wildlife. Removing blockages in waterways — from dams to culverts — supports migratory species like river herring, alewife, American shad and American eel. It also increases the likelihood that these fish populations will persist into the future.

Fish are not the only ones to benefit. Flood risk can be reduced by projects that improve the downstream movement of water and increase floodplain storage. Additionally, dam removal, especially dams categorized as hazardous, prevents loss of human life and infrastructure damage from catastrophic dam failure.

Beach and dune restoration

Restoring beaches and dunes provides important habitat for beach-dependent wildlife, including crustaceans, shorebirds, sea turtles and insects — many of which are endangered,

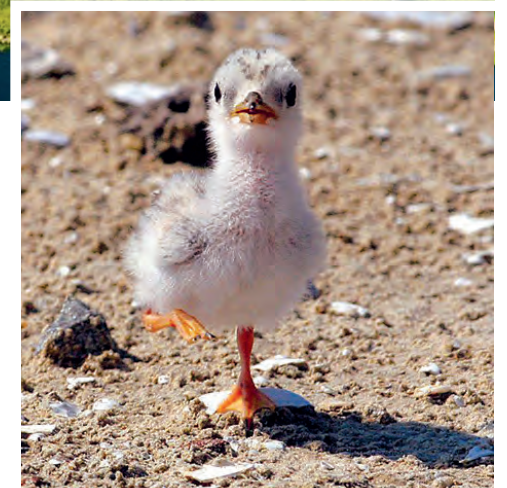
threatened or declining. Many inland communities have been developed close to bays and oceans. Restored beaches and dunes protect these neighborhoods from damage resulting from storm surges and flooding. Beaches also provide an array of recreational activities, adding to local economies.

Green infrastructure

Green infrastructure projects use natural and nature-based designs — rain basins, rain gardens, permeable paving and green streets — to manage stormwater, reduce localized flooding and improve water quality. By capturing stormwater, these projects delay the discharge of water to surrounding areas, which reduces the likelihood of persistent runoff and flooding after a storm. Rain gardens and other plantings also attract bees, butterflies, birds and small mammals.

Green infrastructure has the added benefit of improving over time, whereas traditional hard infrastructure deteriorates over time.

Since Hurricane Sandy, there have been many weather events — from heavy rain to nor'easters — that have tested the storm protection benefits of all of these efforts. In nearly every case, resilience projects have performed well and provided expected benefits. Restored marshes, beaches and dunes



Least terns make shallow nests on beaches. (Leopoldo Miranda / USFWS)

create a protective barrier between waterways and coastal communities, while reconnected streams and rivers reduce coastal and inland flood risk during large rainfall events. Living shorelines stabilize coastlines, reducing wave energy and shoreline erosion. Green infrastructure projects help to store and slowly release rainwater, reducing flood risk in towns and cities. ■

For detailed information about the benefits of coastal resilience projects, type “Evaluation of Hurricane Sandy Coastal Resilience Program” in your search engine.

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service’s Chesapeake Bay Field Office in Annapolis.