CHESAPEAKE
BAY JOURNAL

November 2020 Volume 30 Number 8

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Every plan to offset the nutrients flowing over the Conowingo come with a hefty price tap. The question is: Who is going to pay for it? See page 19. (Dave Harp)

CORRECTIONS

Due to a printer error, content on page 5 of the October issue was replaced with blank space. We apologize for the inconvenience and have included the missing news brief in this issue.

The article *Campaign touts Chesapeake National Recreation Area* in the October issue incorrectly stated the number of National Park Service units in the Chesapeake Bay region. There are about 30 units in the region, and more than 400 nationwide.

The *Bay Journal* regrets the errors.

ON THE COVER

Katey Nelson of the Annapolis Maritime Museum conducts an outdoor program for students. Environmental education organizations are reinventing how they present material amid the coronovirus. (Dave Harp)

EDITOR'S NOTE

After 3 decades, it's time for me to turn the page

It seems so long ago when I climbed into the car holding a floppy disk (remember those?) and drove two hours to Lewisberry, PA, to deliver the first issue of the *Bay Journal* to the printer.

That was 29 years ago. At the time, I had the title of editor, but I was actually a jack of all trades: reporter, photographer and the graphics designer who created each page on the 9-inch screen of a Macintosh SE.

The work paid off. Everyone seemed to take notice of that first 12-page edition. The regional administrator of the U.S. Environmental Protection Agency praised its "interesting and timely information." The government of Montgomery County, MD, called it an "excellent blend of news, science and policy," and numerous interested citizens sent enthusiastic letters.

Over time, the *Bay Journal* has grown from its initial 8–12 pages to 40-48. Our staff has grown as well, though its dedication to explaining news, science and policy has been a constant.

It has been personally and professionally rewarding to oversee that growth and to witness the continued outpouring of reader support. Nonetheless, it is time for a change. Last year, I informed the board of directors of Bay Journal Media, the nonprofit that has published the *Bay Journal* for the last decade, of my plans to step down from the positions of editor and executive director at the end of this year.

Those jobs will land in good hands. I am pleased to say that the board has selected Lara Lutz, our managing editor and assistant executive director, to take over next year. Lara is an ideal choice, having extensive experience with the *Bay Journa*l. She began writing for us in the mid-1990s and became a regular contributor in 2002. In recent years, she served as travel editor and now managing editor, overseeing our website redesign and playing a key role in the redesign of our paper.

While I don't anticipate huge changes, new leadership will help bring a fresh perspective to our work and help develop our vision for the future. It is the right time for that — next year is the 30th anniversary of the Bay Journal, a time to reflect on where we've been and to make plans for where we are headed.

As for myself, I will not be leaving the *Bay Journal*. The change in position will let me focus more time on reporting, writing and undertaking some special projects. After 29 years, I'm still not quite ready to call it quits.

— Karl Blankenship

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BY THE numbers

102
Weight, in pounds, of the largest blue catfish caught in the James River

84
Weight, in pounds, of the largest blue catfish caught in the Potomac River

800
Number of years an Eastern hemlock may live

83,000+
Number of farms in the Bay watershed

$16.1 billion
Market value of farm products produced in the Bay watershed

100,000+
Miles of rivers and streams in the Bay watershed

Marsh birds under threat from rising water

The U.S. Fish and Wildlife Service in October listed the marsh-dwelling black rail as a threatened species. The Chesapeake Bay was once a global destination for birders seeking to add the "feathered mouse" to their life list, but black rails have since vanished from shallow water areas of tidal marshes along the Bay. Several other bird species use similar shallow water areas and could be in danger as sea level continues to rise. Here are some of the birds that may be at risk.

Eastern black rail (Christy Hand, South Carolina Department of Natural Resources)

Marsh wren (Tom Koerner/USFWS)

Saltmarsh sparrow (Wolfgang Wander / CC BY-SA 3.0)

Seaside sparrow (Michael Carlo/USFWS)

Willet (Keenan Adams/USFWS)

LOOKING BACK

25 years ago

Nutrient trading proposed in PA

Pennsylvania released a draft nutrient trading policy that would let wastewater treatment plants and industries meet their Bay-related pollution control obligations by purchasing "credits" from other facilities or farmers who have done more than is required. Proponents were banking on it as a way to reduce the cost of the state's multibillion-dollar Bay cleanup effort. ■

— Bay Journal, Nov. 1995

20 years ago

No net increase in toxic runoff

The Chesapeake Bay Program called for a "no net increase" in toxic stormwater runoff from developed lands after 2010 — meaning that any new development after 2010 would have to either produce no toxic runoff or find ways to offset any additional chemical pollution. ■

— Bay Journal, Nov. 2000

15 years ago

Living shorelines make waves

"Living shorelines" were becoming a popular approach to erosion control, using strategically placed plants, stone and sand to deflect wave action, conserve soil and provide shoreline habitat. A recent Bay Program report emphasized the importance of such techniques to help meet habitat objectives. ■

— Bay Journal, Nov. 2005

10 years ago

Bay's 'pollution diet' draws debate

Thousands of people turned out for a series of public meetings hosted by the U.S. EPA about the new draft cleanup plan for the Bay: the Total Maximum Daily Load or "pollution diet." Some praised it. Others said it would be too burdensome and costly. Speakers voiced deep passion on each side of the issue, and groups were already organizing to challenge the TMDL in court. ■

— Bay Journal, Nov. 2010

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 ten 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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BAY JOURNAL NOTEBOOK

Staff writer Jeremy Cox conducts an interview for a Bay Journal podcast on climate change that will be released in 2021. (Dave Harp)

Received! Reader surveys pouring in

On paper and by email, responses to the 2020 *Bay Journal Reader Survey* have been surging back to us, with well over 2,000 responses now in hand. Please accept a big thanks from our staff for your enthusiastic and thoughtful feedback. The large number of responses means that it will take a while to fully analyze the results, but they already are helping us to learn how the *Bay Journal* meets your needs, how we could do better and what products and activities you'd like to see in the future.

The 2020 survey clearly shows that our readers are an active, engaged group of people with a wide range of environmental interests, from science and current events to travel and history related to natural resources in the Bay region. You seem to like the mix of stories we provide, with a strong interest in learning about stormwater and agricultural runoff, climate change, toxics and land use. We also hear your calls for more stories that involve regional history and environmental justice, and we are working on both.

In earlier surveys, your input helped us to redesign both our website and print publication. Now we are eager to learn if you would like the *Bay Journal* to offer podcasts and reader events. Your input on those questions is helping us plan for 2021, when we'll be marking the *Bay Journal's* 30th anniversary. We are overwhelmed to see that, based on results so far, about 82% of you would like to participate in reader events and roughly 75% would be interested even if that event were offered online. Outdoorsy folks as you are, hikes and paddles interest you, too, depending on COVID-19 safety concerns.

As for a *Bay Journal* podcast, get ready to click your download button. Nearly 65% of survey respondents are interested in this, and we plan to deliver our first series in early 2021.

Perhaps the best news in the surveys? So far, they show that nearly 80% of you refer others to the *Bay Journal!* That's great news for the *Bay Journal* — and for the people who care about clean air, clean water and healthy ecosystems in the Chesapeake region. ■

— Lara Lutz
Managing Editor

NEWS briefs

LOCAL
REGIONAL
NATIONAL

UPDATE: Wegmans development proposal may impact more VA wetlands

Stiff opposition to a proposed $175 million Wegmans regional food distribution complex in Hanover County, VA, has led to another call for public comment over a draft water permit.

The 1.7 million-square-foot complex would be built on 217 acres in Ashland that contains forested wetlands and abuts residential neighborhoods and the rural Black community of Brown Grove.

The project enjoys the full support of county officials and Gov. Ralph Northam, who tout the additional tax revenue and promise of 700 full-time jobs.

Wegmans Food Markets Inc. says the new facility is needed to serve additional supermarkets in Virginia and a planned expansion into North Carolina.

But Ashland residents and conservation groups object to the destruction of wetlands and any damage to archaeological and grave sites, as well as heavy truck traffic on local roads, minimal transparency in the permitting process and environmental justice issues.

They also objected to the rarely used "mosaics" method the Corps initially employed to assess the amount of wetlands that could be impacted. For the project's revised draft Virginia Waters Protection Permit, that method was dropped and the amount of wetlands rose from just more than 6 acres to about 15 acres.

Comments can be submitted to the Virginia Department of Environmental Quality through Dec. 4 and the U.S. Army Corps of Engineers through Nov. 16. The DEQ will hold an electronic public hearing on Nov. 19.

To submit comments to DEQ, go to deq.virginia.gov/programs/water/wetlandsstreams/publicnotices.aspx.

To submit comments to the Corps, go to www.nao.usace.army.mil/Media/Public-Notices/Article/2381594/nao-2012-02369/. ■

New attendance record for MD State Parks

The Maryland Park Service in October reported a total of 17.1 million visitors to date in 2020, surpassing the record of 14.9 million total visitors in 2019, with three months remaining in the year. During peak season in July, state parks attracted 3.4 million visitors, compared with 2.5 million during the same time period in 2019.

Park attendance has been trending up in recent years but has the pace has accelerated dramatically in 2020. Various parks within the system have closed because of maximum capacity a record 260 times so far in 2020 — well above the 10-year annual average of 79 closures per year — and surpassing the previous record of 121. Increases have been seen in both day use and overnight camping.

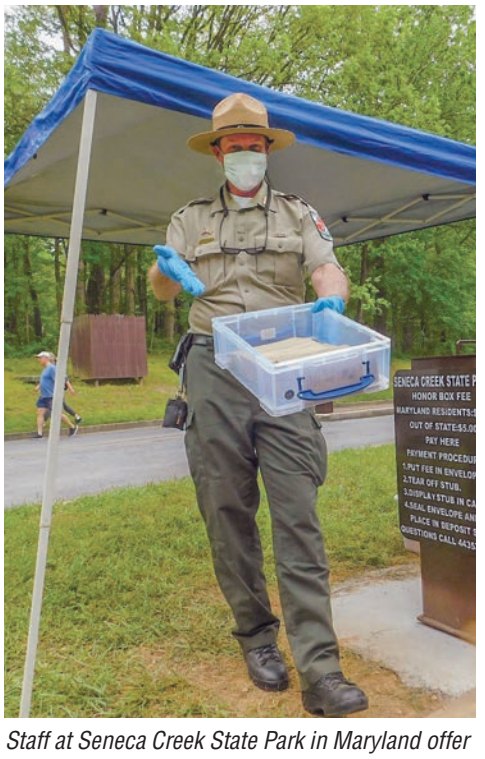
"During these difficult times, many individuals and families are turning to outdoor recreation to help them get through," said Secretary Jeannie Haddaway-Riccio of the state Department of Natural Resources.

From the outset of the COVID-19 pandemic, the DNR and the Maryland Park Service developed response plans based on guidance from the U.S. Centers for Disease Control and Prevention and state departments of health and commerce.

These plans aim to protect the health of the staff as well as park visitors.

"We have seen tremendous interest in outdoor recreation and are encouraged to see so many Marylanders and visitors continuing to enjoy the outdoors responsibly," said park service superintendent Nita Settina. ■

See **BRIEFS**, *page 6*



Staff at Seneca Creek State Park in Maryland offer a contactless entrace fee system. (Courtesy of Maryland Dept. of Natural Resources)

briefs

From page 5

Bay dead zone smaller than usual

A cool spring followed by summer storms helped to keep the Chesapeake Bay's 2020 dead zone — an oxygen-starved region off limits to most aquatic life — smaller than in recent years.

The Virginia Institute of Marine Science reported that this year's dead zone throughout the Bay was smaller than 80% of those recorded in the last 35 years. The Maryland Department of Natural Resources reported that the 2020 dead zone in its portion of the Bay was the second smallest observed in the state since monitoring began in 1985. Scientists had predicted a smaller dead zone this year based on reduced spring rainfall that produces less nutrient-rich runoff flowing off the land and into the Bay.

Hypoxic and anoxic regions — areas with little to no oxygen, respectively — are caused by excess nutrient pollution entering the Bay. One way nutrients can enter the Bay is through the rivers that drain into it; higher rivers flows deliver more nutrient pollution. The previous two years have seen above-average flows, with 2019 setting a record high.

According to the U.S. Geological Survey, the current year (measured from Oct. 1, 2019–Sept. 30, 2020) has been normal. ■

Bay scientist Michael Kemp passes away

Michael Kemp, professor emeritus of the University of Maryland Center for Environmental Science, renowned for his research on estuaries, has died after a battle with Parkinson's disease.

A pioneering researcher on the Bay, Kemp made significant contributions to the understanding of nutrient cycling in estuaries, the ecology of underwater grasses and estuarine ecosystems, the causes of aquatic "dead zones" and more.

"Michael Kemp made his mark during his long and distinguished career as one of the most outstanding systems ecologists in the world working on coastal marine ecosystems," said UMCES president Peter Goodwin.

Kemp began working at UMCES' Chesapeake Biological Laboratory in 1977 and joined its Horn Point Laboratory in 1978. During his 35-year career, Kemp collaborated with scientists in Australia, China, Denmark and Mexico. He served on the editorial boards of two scientific journals and led national and international symposia on estuaries. In 2012, he received the University System of Maryland's highest honor, the Regents' Faculty Award for Excellence; in 2009, he was the co-recipient with Walter Boynton of one of the most prestigious awards in his field, the Odum Award for Lifetime Achievement from the Coastal and Estuarine Research Federation.

Kemp also had a distinguished record of teaching and mentoring students, including 24 graduate students and many undergraduate interns. "One of Michael's great joys of working at UMCES was his mentoring and interactions with students. His door was open to all students and he took interest in learning about their research projects," said Michael Roman, director of Horn Point Laboratory.

Kemp's family has created the Michael Kemp Student Fund to support Horn Point graduate students in his name. To donate, visit umces.edu/michael-kemp-student-fund. ■

Public input sought on future of VA's Natural Bridge State Park

One of the Chesapeake Bay watershed's most stunning natural spectacles is at a crossroads, and officials are asking the public to help steer it in a new direction. The Virginia Department of Conservation and Recreation is seeking comments on a 10-year master plan for Natural Bridge State Park. The park's focal point is a 215-foot-tall, 90-foot-long limestone arch that is traversed by a major north-south highway, U.S. Route 11.

Under the proposed plan, the DCR would collaborate with the state Department of Transportation on efforts to remove the highway from the top of the Natural Bridge. In 2018, a geological study by Radford University found that while Route 11 remains safe for travel, the bedrock formation beneath it contains fractures, air pockets and boulders susceptible to breaking free and plummeting to the trail below. If the road stays, vibrations from traffic and stormwater flowing off the hard surfaces will continue to slowly weaken the formation's integrity, researchers said in the report. They recommended removing the road and routing its traffic elsewhere.

A large limestone arch is the focal point of Natural Bridge State Park in Virginia. (Virginia State Parks)

The popular tourist attraction is privately owned but has been managed by the state since

2016. One of its former owners was Thomas Jefferson, who purchased the landmark from King George III of Great Britain in 1774.

The master plan also calls for turning at least portions of an existing hotel into an environmental education center, adding more parking lots, creating a campground and removing and repairing dams on the park's waterways. Comments can be emailed to lynn.crump@dcr.virginia.gov or faxed to 804-371-7899. The deadline for submissions is Nov. 21. ■

Mixed spawning success for striped bass this year in Chesapeake Bay

Striped bass can't get a break, it seems. With their East Coast population in decline from overfishing, the migratory species had mixed success reproducing in the Chesapeake Bay this year, surveys show.

The Maryland Department of Natural Resources reported in October that its annual trawl survey of newly spawned striped bass in state waters yielded just 2.5 little fish per net haul — far below the long-term average of 11.5 per sample. This is the second straight year and the 10th in the last 15 years that the DNR survey found evidence of below-average striped bass reproduction.

A separate study done by the Virginia Institute of Marine Science found an above-average number of juvenile striped bass in that state's Bay tributaries. It was the eighth straight year in which the survey tallied an average or above-average abundance for the species.

But VIMS cautioned that its finding of 13.89 young fish per seine haul in 2020 — compared with a long-term average of 7.77 per haul — could be inflated. Its survey had to be curtailed by nearly one-fifth because of Tropical Storm Isaias and restrictions placed on research as a precaution for the coronavirus pandemic.

Another study using an alternative measure for striped bass abundance indicated that the 2020 spawn produced an average number of young fish, VIMS noted.

It's not uncommon for the two states' surveys to get different results, though it's not clear why. VIMS noted that it also found average juvenile abundance in 2013, 2016 and 2019 when Maryland DNR got below-average numbers those years.

Striped bass spawning success varies from year to year, as it does with many other fish species, and it is influenced by environmental factors such as water temperature and rainfall.

"We've had these events before," said Mike Luisi, the DNR's director of fisheries monitoring and assessment. "We plan to continue with all of our conservation measures that we need to do to increase [the size of the] spawning stock … to whatever degree we can."

The striped bass population has been in trouble before. It declined drastically in the late 1970s and early 1980s, rebounding only after Maryland, Virginia and Delaware imposed fishing moratoriums and other states severely restricted catches. After an extended period of renewed abundance, the species began to decline again more than a decade ago, a gradual swoon that finally prompted East Coast fishery managers last year to order an 18% reduction in catch coastwide.

The Atlantic States Marine Fisheries Commission, which regulates near-shore fishing for striped bass and other migratory fish, is weighing a revision of its overall management plan for rebuilding and maintaining striped bass stocks. ■

Biologist Matt Whitbeck was honored for his climate adaptation work at Blackwater National Wildlife Refuge. (U.S. Fish & Wildlife Service)

Matt Whitbeck honored for reducing marsh loss at Blackwater refuge

U.S. Fish & Wildlife Service biologist Matt Whitbeck has been honored by his peers for his efforts to reduce marsh loss at Blackwater National Wildlife Refuge on Maryland's Eastern Shore. The Association of Fish and Wildlife Agencies in September gave him its 2020 Climate Adaptation Leadership Award for Natural Resources.

Whitbeck was recognized for his work with the Conservation Fund and Audubon Maryland-DC on a strategy to help the shrinking marsh at Blackwater adapt to climate change. Through a combination of land subsidence and rising sea level, Blackwater has lost more than 5,000 acres of marsh since the refuge's creation in 1933. .

Whibeck oversaw a novel restoration effort begun in 2017 that involved raising the height of some marsh areas with a thin 4– to 6-inch layer of sediment that was pumped from elsewhere in the refuge.

He also pulled together the project's funding, including more than $2 million in federal aid given to recover from Superstorm Sandy. ■

Tests in Southern MD find little to no PFAS in oysters, water

Activists disagree, say their testing found higher levels

By Timothy B. Wheeler

A new round of testing for "forever chemicals" in St. Mary's County, MD, found "no levels of concern" in oysters or in the waters of the Chesapeake tributaries where the shellfish were growing.

Sampling done by the Maryland Department of the Environment detected no PFAS, or per– and polyfluoroalkyl substances, in oysters collected from rivers and creeks near Naval Air Station Patuxent River. Surface waters sampled where those oysters were growing registered what officials called "very low" levels of the chemicals.

Some environmental activists, though, questioned the state's interpretation of its findings — in part because they came up with somewhat different results from their own testing. But they also note that what the MDE considers very low levels in water are well above PFAS exposure thresholds recommended in the European Union, and they question whether officials here are doing enough to identify and set safe standards for public health.

Working with the St. Mary's River Watershed Association, the nonprofit group Public Employees for Environmental Responsibility reported that a lab it hired had detected low levels of three PFAS compounds in oysters collected in September from county waters.

Kyla Bennett, PEER's science policy director, disagreed with the MDE's assurances that there's little health risk. She contended that the state's testing was too limited, both in scope and sensitivity, to reach such a conclusion.

"I think we need to know more," she said.

The varying test results come seven months after the Navy disclosed plans to investigate PFAS contamination in groundwater at its airbase at the mouth of the Patuxent River and at Webster Field, an annex nearby on the St. Mary's River. The groundwater contamination was believed to stem from the Navy's use of firefighting foam containing PFAS compounds at those facilities.

In widespread use since the 1940s, PFAS can be found in household products such as non-stick cookware, water-resistant clothing and personal care products. They've also been an ingredient in firefighting foams used at fire-training facilities, airports and military installations. PFAS do not break down easily, and they can build up in animals or organisms that ingest them, including people.

Bob Lewis of the St. Mary's River Watershed Association checks out oysters growing in a cage off a dock at St. Mary's College of Maryland. (Dave Harp)

Jay Apperson, the MDE's deputy communications director, said the results of the groups' oyster tests were similar to the MDE's, describing both studies as finding PFAS at levels so low they were at best barely detectable.

Robert T. Brown, Sr., president of the Maryland Watermen's Association, said he was concerned but not alarmed to hear that testing had detected PFAS in oysters. "I'm just waiting to hear what … the scientists have to say about it," he said, "but I'm glad to hear overall that our oysters are pretty safe."

PEER's Bennett said she wasn't criticizing the state for the limitations of its testing, only for the conclusions it drew. With so many PFAS compounds in use and new ones being developed, states lack the funds and often the expertise to deal with them all, she said.

"We're playing whack-a-mole with these chemicals and we can't keep up," she said. "The only way to get a handle on this is to regulate them as a class." ■

Menhaden commercial catch cut for the East Coast

Goal is to help save striped bass, but is it enough?

By Jeremy Cox

One of the most crucial fish in the Chesapeake Bay's aquatic food web is getting more protection from potential overfishing but not as much as some environmentalists and state fishery managers had wanted.

The Atlantic States Marine Fisheries Commission agreed on Oct. 20 to cut the allowable commercial harvest of Atlantic menhaden 10% from what it has been the last three years.

The commission's decision marked a shift in the way it establishes catch levels. Traditionally, policy makers have relied on abundance and death rates of a single species to make that call. In August, commission members switched to an "ecological reference point" that accounts for menhaden's value as food for predators, especially striped bass.

While the menhaden population is considered relatively robust, striped bass numbers are low. The big dilemma for regulators: Should the small, oily fish be managed for the small striped bass population that exists now or the larger one they envision building?

The vote by the commission's Menhaden Management Board was 13–5 in favor of the 10% reduction, with state delegations from Connecticut, Florida, Georgia, North Carolina and Rhode Island in opposition.

That means the maximum commercial harvest in all East Coast waters for 2021 and 2022 would be 194,000 metric tons. A 51,000-metric ton cap on how much of the menhaden catch can come from the Chesapeake Bay would remain unchanged.

During the annual meeting of the commission, which regulates migratory species in state waters, backers of a measure to reduce catches by 20% fell short of the support required for approval.

"In any good marriage, there has to be a compromise," said A. G. "Spud" Woodward, a retired Georgia fisheries manager who is the board's chairman.

Every Bay watershed state on the board — Delaware, Maryland, New York, Pennsylvania and Virginia — sided with the 10% cut.

While most of the menhaden harvest gets processed into animal feed and human dietary supplements, a significant portion is used as bait for other fisheries. (Dave Harp)

A gradual reduction in the annual catch will help soften the economic blow to the seafood industry, said Steven Bowman, a board member and head of the Virginia Marine Resources Commission, the state's tidal fishery regulator.

"We have to consider the people that are involved in this as well," he said. Omega Protein Corp., the largest menhaden harvester in Chesapeake and Atlantic waters, employs 260 people at its processing plant in Reedville, VA.

While most of the menhaden harvest gets processed into animal feed and human dietary supplements, a significant portion is used as bait for other fisheries. A 20% cut would siphon about $1 million annually from the fishing industry in New Jersey alone, said Jeff Kaelin, former chair of the ASMFC board's advisory panel and a government relations specialist with Lund's Fisheries in New Jersey.

Environmental groups have urged regulators for years to consider menhaden's importance to predators.

"The new lower limit will help ensure that striped bass will have an abundance of forage, which is vitally important to a successful rebound of this population," said scientist Chris Moore of the Chesapeake Bay Foundation in a statement.

Omega Protein maintained after the meeting that it preferred no change in the catch. But the 10% decrease "is not an unreasonable step toward moving to ecological management of the species," the company said in a statement. ■

Baltimore gives forest patches more legal protection

City goes beyond state law to limit removal of smaller tracts of trees

By Timothy B. Wheeler

Katie Lautar, left, and Miriam Avins of Baltimore Green Space stroll on a path through "Fairwood Forest," the unofficial name for a nearly 4-acre patch of privately owned woods in Northeast Baltimore. (Timothy B. Wheeler)

Baltimore has become the latest Maryland locality to strengthen protections for its forestland. You heard that right: The city, where some densely packed rowhome neighborhoods are practically treeless, has acted to prevent the loss of what woods it has left.

On Sept. 21, the City Council unanimously adopted legislation that expands legal protection to wooded areas too small to be covered by the state's Forest Conservation Act.

After failing repeatedly to persuade Maryland lawmakers to strengthen the state forest conservation law, environmental groups have shifted gears to lobby local governments. Anne Arundel, Howard and Frederick counties have all adopted local forest conservation requirements in the past year that go beyond the state law.

Under the new city law, developers or landowners could be required to plant new trees if they plan to clear at least 5,000 square feet of woodlands — an area smaller than the floor space in some of the larger suburban homes. But in Baltimore, a builder could construct at least three row houses on a tract that size.

Maryland's forest conservation law, in comparison, applies only when someone wants to clear 20,000 square feet or more of trees.

The legislation is a hard-won victory for Baltimore's environmental groups, which teamed up to press for its introduction and passage. Working with City Hall, groups such as the Baltimore Tree Trust, Blue Water Baltimore, Parks & People Foundation and the Alliance for the Chesapeake Bay have planted thousands of saplings and seedlings across the city. Together, they've managed to increase the tree canopy by about 2,000 acres.

But trees still cover just 28% of Baltimore's landscape, well below the city's goal of 40% coverage. And most of those trees are in municipal parks, not where people live or spend most of their time.

A tiny nonprofit called Baltimore Green Space played a pivotal role in drawing attention to the need to protect existing woodlands from development if the city is to have any hope of reaching its urban tree canopy goal.

Originally founded to help neighborhoods secure open land for community gardens and pocket parks, the group branched out several years ago to advocate for the city's forest patches. The organized effort trained squads of forest stewards to adopt and tend to woodlots or groves of trees on small tracts of land that somehow got passed over as the city grew and filled in.

That shift came after trying to help residents save some woods in Wilson Park, a small community in North Baltimore that was among the first developed specifically for African American homeowners.

"Our work shaping this legislation was galvanized by the forest stewards we work with and the loss of several forested lots of Wilson Woods," said Katie Lautar, Baltimore Green Space's executive director. "While we could not protect those lots, we have worked to ensure that moving forward, smaller forests will have stronger protections."

> *There are nearly 2,400 privately owned woodland patches in the city as small as 5,000 square feet that now enjoy protection because the city tightened its law.*

The group worked over the years to document and publicize the need. With Matthew Baker, a professor of geography and environmental systems at the University of Maryland, Baltimore County, the group found that 20% of the city's forestland is outside of municipal parks.

Further, they determined that there are nearly 2,400 privately owned woodland patches in the city as small as 5,000 square feet that would remain unprotected if the city hadn't tighten its law.

Working with the city's Office of Sustainability and the city's state-appointed forestry board, environmental groups succeeded in getting the mayor's office to introduce forest conservation legislation, which quickly moved through the council. Advocates pointed out that forest patches can be found throughout the city, not just in the more affluent neighborhoods. They help cool neighborhoods, improve air quality and provide places for children and adults to play and access nature. They also serve as some of the most effective curbs on flooding and polluted stormwater runoff.

In a news release celebrating the bill's passage, the groups said they hope it's the first of several pieces of legislation put forward by City Hall to enhance and preserve Baltimore's tree canopy.

"We are thankful for the steady input of the Office of Sustainability to forge a better balance of green to gray infrastructure for our beloved city," said Amanda Cunningham, a member of the Baltimore City Forestry Board. ■

USFWS adds black rails to "threatened" list, some say too late

Bird of low marshes has disappeared from Chesapeake region

By Karl Blankenship

A bird bander holds a black rail. As recently as 1990, the eastern black rail was a common bird found in marshes along the Bay. Now, the U.S. Fish and Wildlife Service, citing the inundation of nests from more frequent storms and increasingly high tides, has put the low marsh bird on the threatened species list. (Woody Woodrow / USFWS)

Just five decades ago, Elliott Island on Maryland's Eastern Shore was a global hotspot for avid birders who wanted to add the diminutive Eastern black rail to their life lists.

Scores of the birds nested in the low-lying marshes of Dorchester County, and birders in wee hours of the morning could hear — though often not see — the distinctive "*kickee-doo*" call of the ground-nesting bird.

But no black rails have been found there in years — or anyplace else around the Chesapeake Bay — as sea level rise has drowned their nesting sites. The sparrow-size bird has also vanished from much of its historic habitat along the East Coast and is rapidly declining in most of the areas where it remains.

As a result, the U.S. Fish and Wildlife Service on Oct. 7 listed the Eastern black rail as "threatened" under the Endangered Species Act.

"It should have happened before, but that's just not the way these things work," said Bryan Watts, director of the Center for Conservation Biology at the College of William and Mary and Virginia Commonwealth University, who has surveyed black rails for decades throughout much of their range. "This species is in pretty sad shape at the moment."

Indeed. In its decision, the Fish and Wildlife Service cautioned that there is a "high probability" the species could be gone altogether by 2068.

As recently as the early 1990s, surveys estimated that there were 140 individual black rails living around the Bay, but that decreased to 24 by 2007 and eight in 2014 — a decline of more than 90% in less than 25 years.

Watts said no black rails have been detected around the Chesapeake in recent years, though individuals have occasionally been spotted in Maryland wetlands farther inland.

Black rails were once found from Texas up the East Coast as far as Massachusetts. Over time, they have suffered major habitat loss as marshes were buried to make way for urban growth. Places such as Cambridge, MA; Queens, NY; Atlantic City, NJ; and Baltimore once supported black rails. The historic ditching and draining of marshes on the Bay's Eastern Shore eliminated more habitat.

Now, black rails are primarily found in South Carolina and farther south. The strongest populations are in southern Florida and along the Texas coast, where hundreds of the birds still persist.

"It's likely that Florida and Texas support a very high percentage of the current population," said Watts, who has conducted surveys in those areas in recent years. "It may be sort of a last stronghold throughout the range, at least for the foreseeable future."

Black rails live in shallow wetlands with slow-moving, but not stagnant, water. They build nests on clumps of grasses that rise just above water level and which have protective brush overhead.

In recent decades, most remaining birds have been confined to the upper reaches of undisturbed tidal marshes. But those areas are now rapidly being drowned by rising water levels and more frequent storms, which inundate their nests.

"The situation has become more and more clear over time. Sea level rise unquestionably is what has precipitated the catastrophic decline," Watts said. "It's undeniable as to what's going on here."

A few scattered populations are found farther inland, but they are small and mainly in the Great Plains of Colorado and Kansas. It's unknown how many birds may once have nested in inland wetlands, but over time much of that habitat has been drained, mowed, harvested for hay or periodically burned to reduce woody growth.

The threatened species listing will help protect areas known to have black rails from activities such as mowing or managed burns that harm their remaining habitat.

But the Fish and Wildlife Service declined to identify specific locations that provide critical habitat for black rails. The service said such action was "not prudent" because identification of such areas could lead to trespassing by birders on private lands and on areas of public land that are closed to public access, as well as the trampling of the birds' habitat.

The failure to designate critical habitat was criticized by the nonprofit Center for Biological Diversity, which had originally petitioned the federal agency to protect the bird in 2010.

"After a decade of being ignored, these shy, fascinating birds are finally getting some much-needed protections," said Stephanie Kurose, senior endangered species policy specialist at the Center for Biological Diversity.

"But federal officials' refusal to designate critical habitat is a big blow to these little creatures," she added. "If the rail is going to have any chance of survival, we must protect the coastal wetlands where it lives from polluting industries, urban sprawl and increasing sea level rise."

The Fish and Wildlife Service will develop a recovery strategy for black rails over the next three years. But with rising sea levels, Watts said survival of the birds may depend on finding or creating suitable wetlands in inland areas. ■

Nansemond's shellfish woes point to upstream issues

Suit blames old pipes, growth, for high levels of bacteria in VA river

By Whitney Pipkin

Robert Johnson spends as much time watching the weather forecast as he does harvesting oysters these days.

Since about 2014, increasingly larger areas of the Nansemond River he's been scouring for market-ready oysters for the past 40 years have been closed to harvesting. Some closures are temporary, driven by spikes in pollution from stormwater runoff and sewage overflows. Others are permanent.

While wastewater treatment has helped to reduce the bacteria pollution that makes shellfish unsafe to eat in many Chesapeake Bay waterways, the Nansemond has been heading in the wrong direction for about six years — a time of increased population growth in its watershed.

This year, heavy rains in late September caused aging pipes already under repair to gush millions of gallons of sewer-tainted water into the Nansemond, causing the Virginia Department of Health to close almost all of the beds Johnson and others would have harvested for several days.

"We have old [sewer] lines carrying the effluent and more customers on those lines. The system just cannot handle it," said Johnson, who owns Johnson and Sons Seafood in Suffolk, VA. "If you don't expect to have storms [in the fall] with 3–4 inches of rain in a 24-hour period, then your system isn't set up to handle what it should be set up to handle."

The Hampton Roads Sanitation District, which manages the Nansemond Treatment Plant and 17 other plants like it in the region, has several projects in the works to replace or fix aging pipes. But while the district has been working under a consent decree with the U.S. Environmental Protection Agency since 2010 to reduce sewage overflows in the system, the decree does not include specific deadlines for the work.

Johnson is a reluctant spokesman for the few oystermen who still harvest in the Nansemond — and who think the city and regional water treatment authority aren't doing enough to maintain the water quality they need to keep oystering in the midst of a growing local population.

In a lawsuit headed to the Virginia State Supreme Court Nov. 4, the oystermen say not protecting the water quality on which their oyster leases and livelihoods depend amounts to damaging property. They are seeking compensation for their loss of oysters resulting from untreated sewage and wastewater releases that rendered the river bottom closed to harvests.

Workboats ply the Nansemond River in Virginia, where bacteria levels have increasingly closed parts of the river to oyster harvests. (Dave Harp)

"The only people protecting the Nansemond River, in my opinion, is the oystermen," said Joe Waldo, an attorney representing them in the case. "If it weren't for the oystermen, I don't think the public would know about these discharges of raw sewage."

Eyes on oysters

Oystermen in this Virginia corner of the Chesapeake Bay region have a history of raising red flags about local water quality.

In 1925, state officials commissioned a study to determine what was ailing the shellfish industry after the closure of a large oyster-producing region near Hampton Roads. Untreated sewage turned out to be a major culprit. That finding eventually led to the creation of the Hampton Roads Sanitation District to treat and reduce the amount of sewage flowing directly into local waters.

When the sanitation district was first created in 1940, about 30 million gallons of raw sewage were being discharged into the river daily in the absence of centralized wastewater treatment. Now, according to general manager Ted Henifin, the district's plants treat an average of 150 million gallons a day.

"Unfortunately, bacteria impairment of local waterways continues to be an issue," Henifin wrote in an email.

Bacterial contamination can come from human sources, such as sewage and septic system leaks, as well as from pet waste and wildlife.

The sanitation district recently worked with the city of Suffolk and the Nansemond River Preservation Alliance on a microbial source tracking program to identify potential human sources of high bacteria levels found in the river, tracing the sources back to aging infrastructure and some septic systems in need of repair.

Elizabeth Taraski, president and CEO of the river alliance, said the bacteria remain a pesky problem, particularly for the

Lucidity Information Design, LLC

watermen trying to work in and near the Nansemond River.

A group of citizens started the organization a decade ago after seeing "what had happened to waterways in Virginia Beach and Norfolk — and seeing that the next area for development was Suffolk," Taraski said.

The river group has been tracking water quality markers ever since. Levels of nitrogen, the largest cause of water quality problems in the Chesapeake Bay, are actually low in the Nansemond. But bacteria trends since 2014 have not been good. Bacteria levels have been increasing, as has the amount of phosphorous and the amount of murkiness in the water, according to the river alliance's reports.

In 2019, another shellfish harvesting area in the river that had been considered healthy was declared conditionally approved for harvesting, meaning a half-inch rain could close it to oystermen for several days.

"That was another red flag," Taraski said. "Our concern is that we're having so much more development in Suffolk — more impervious surfaces and dogs and potential sources of bacteria — and we need to educate all citizens on their responsibility."

Geoff Payne and Elizabeth Taraski of the Nansemond River Preservation Alliance observe a construction site along the Nansemond River in Suffolk, VA. A group of citizens started the organization a decade ago to help maintain water quality in the midst of development. (Dave Harp)

Growth pressures

The city of Suffolk stretches across an area the size of most Virginia counties, making it the largest footprint of any city in the state. The southern portion of Suffolk is rural and largely agricultural, with historical roots in peanuts. The birthplace of Mr. Peanut, the marketing icon of Planter's Peanuts, Suffolk still hosts an annual Peanut Fest every October (except this year, due to COVID-19). Southeast Suffolk opens into the more than 100,000-acre Great Dismal Swamp National Wildlife Refuge.

The Nansemond weaves through the heart of Suffolk's developed core, running nearly 20 miles to meet the James River just before it pours into the Chesapeake. Located just west of bustling Norfolk, Suffolk's population has grown by nearly 10% the last decade, reaching almost 94,000 in 2019.

Suffolk spokeswoman Diana Klink said the city has seen growth in several economic sectors as military families, in particular, expand their hunt for affordable homes farther afield of Norfolk Naval Station. To keep up with demand, the city is in the midst of a house-building boom with 11,600 residential units in the pipeline, Klink said, an increase similar to what the region saw during the housing boom of 2005.

Johnson said he's watched that growth pick up on land and seen the impact in the water, too.

Jon Mueller, vice president for litigation for the Chesapeake Bay Foundation, said he's seen this pattern — new development followed by shellfish harvest closures — play out in several places around Hampton Roads over the years. Similar scenarios have also evolved over the decades with pockets of development along Maryland's Western Shore. Mueller wrote an amicus brief supporting the oystermen's lawsuit to the Virginia Supreme Court.

"It seemed pretty unfair that people can spend money to lease oyster or clam bottom only to have that leasehold diminished or destroyed because of a decision to develop adjacent land," Mueller said. "If we want to preserve that aspect of Bay life and the economy, then I think we need to be more protective of where we put growth and how we do it."

An engineered shoreline is constructed along the Nansemond River in Suffolk, VA. (Dave Harp)

The oystermen agree, which is why they appealed a lower court's decision to the state Supreme Court. The Suffolk Circuit Court judge had cited in his opinion a 100-year-old U.S. Supreme Court case that "held an oyster bed lessee's property rights [to use the river bottom] is subordinate to the locality's right to pollute the waterways."

Waldo, the oystermen's attorney, argues that such a reading of the law is outdated given the advent of the 1973 Clean Water Act and the ability of current technology to provide for both uses by treating wastewater. The case could end up hinging on a reading of state property rights laws.

Either way, Waldo thinks the technology exists to reduce bacteria pollution much more quickly — and perhaps fast enough to save the oyster grounds on which his clients depend. Adding additional development to a sewage and wastewater system that is antiquated and already subject to leaks and overflows amounts to the wastewater utility "not doing the job," he said.

"I think Suffolk is entitled to its due. It's got a lot of bays, estuaries, wetlands; it's beautiful and more rural," Waldo said. "Today, people are recognizing it as a great place to live. But the city can't just let it expand and not take care of the infrastructure." ■

Blue catfish strategy: When we can't beat 'em, eat 'em

Aim is to reduce numbers before fish spreads to new waterways

By Karl Blankenship

Some have advocated trying to eradicate blue catfish, but they are enormously popular with anglers. Fisheries agencies in each state around the Bay are trying to balance competing objectives. (Dave Harp)

Blue catfish, the invasive fish with a big appetite that is overwhelming many Chesapeake Bay tributaries, is probably here to stay.

But a new management plan says that with coordinated action — including ramped-up efforts to get people to develop an appetite for them — states can help limit their ecological harm.

The state-federal Bay Program recently released an Invasive Catfish Management Strategy, which represents the first Baywide effort to coordinate actions for dealing with the fish.

Blue catfish are a native of the Mississippi River basin but were introduced in Virginia's Bay tributaries in the 1970s and 1980s to help build a recreational fishery.

For nearly two decades, they persisted without much notice. But in the mid-1990s, their numbers surged as the species proved surprisingly adaptable to the region's nutrient-rich tidal rivers.

In recent years, they have spread to the Potomac River and Maryland's Western Shore tributaries, as well as some on the Eastern Shore.

Because of their huge numbers, long lifespan, large sizes and voracious appetites, scientists have worried that blue catfish have the ability to upend river ecosystems, harming populations of native fish like American shad and potentially even blue crabs.

There's been little consensus about what to do about them, though. Some have advocated trying to eradicate them, but they are enormously popular with anglers. In the James River, surveys have shown as much as 40% of the recreational fishing effort is aimed at blue catfish.

The new strategy, approved by fisheries agencies in each state around the Bay, tries to balance those competing aims.

It says plans should ultimately be developed for each major Bay tributary, because management goals and the level of threat is not the same everywhere. Studies have found that the population density, growth rate and diet of blue catfish can be dramatically different from place to place.

For instance, in the James River their diet switches from primarily vegetation and invertebrates to mostly fish when they reach 20 inches. In the Mattaponi and Pamunkey rivers, that doesn't occur until the fish are almost 36 inches.

The tributary approach tacitly acknowledges that the invader will never be eradicated from the Bay. In some places, like the James River, management would likely focus on promoting a robust recreational fishery.

But in other tributaries, where their populations are small, biologists may pursue more aggressive actions to control their numbers and protect other species.

"Maybe eradication would still be possible in some of the tributaries where they aren't quite established," said Mandy Bromilow, a fisheries specialist with the National Oceanic and Atmospheric Administration Chesapeake Bay Office, who coordinated the effort to develop the plan. "But someplace like the James where we're seeing insane densities of the catfish, maybe that's not quite possible."

One common thread throughout the strategy is to launch education efforts that warn people about the threats caused by invasive species. Those efforts would also encourage people, including anglers, to eat blue catfish, rather than tossing them back into a river.

The strategy promotes eating more blue catfish, before they can eat too many native species, as part of the solution.

"We want to bring awareness to the tastiness of this fish," Bromilow said. "People have this misconception about catfish being this dirty bottom feeder — like 'who would want to eat that?' But that's not really the case."

Similarly, the strategy calls for trying to build commercial markets for the fish.

Large numbers are already being harvested. About 2.8 million pounds of blue catfish were netted in the Potomac River in 2018, and commercial catches in the James have been averaging about 1 million pounds in recent years, according to the strategy.

But more would need to be caught to make a significant dent in the population, which would require building a bigger consumer market.

Efforts to expand the blue catfish market have been constrained in part by a provision in the 2014 Farm Bill that requires the U.S. Department of Agriculture to inspect catfish before they can be processed and sold. That's created a processing bottleneck, as harvests often take place at times when inspectors are not available.

The strategy calls for trying to exempt the Bay from the processing requirement, and for developing an economic impact analysis to support their case.

Still, even if harvests are increased, biologists don't know how many catfish would need to be removed to reduce potential ecological impact. The strategy cites improved tributary-based population estimates, along with improved ecosystem modeling, as a key research need to support management decisions.

Another research priority is trying to piece together a more complete picture of their actual ecosystem impact. There is evidence they are outcompeting native white catfish for habitat. But it is unknown whether they are eating enough other fish to cause problems, which may vary from place to place.

"Blue catfish are feeding on species that we would consider to be of conservation concern — things like river herrings, blue crabs, American eels," Bromilow said. "It's just a question of whether they are really eating so much that it's going to significantly affect their populations. That's something where we need more data."

One thing the plan envisions is developing a scorecard or indicator for each river that estimates the status of blue catfish or the risk of invasion if blue catfish have not arrived. If at-risk tributaries are identified, monitoring efforts could be ramped up so that if the invaders are detected, removal might be possible before they become established. ■

Solar siting in MD generates friction, threatening climate goals

Task force wants more panels on brownfields, roofs to preserve ag land

By Timothy B. Wheeler

Steve Levitsky, Perdue Farms Inc.'s vice president for sustainability, walks through the pollinator garden that surrounds the company's solar array at its Salisbury, MD, headquarters. Some solar developers are planting these habitats with projects to address complaints about farmland being lost. (Dave Harp)

Despite Maryland's ambitious commitment to renewable energy, solar power continues to generate friction across the state. Large utility-scale projects have been bogged down in regulatory reviews and lawsuits, as farming interests, local governments and conservation groups push back against placing photovoltaic panels on cropland and pasture.

Last year, to fight climate change and reduce fossil fuel use, Maryland lawmakers voted to require half of the state's energy to come from renewable sources by 2030, joining just seven other states at that time in aiming that high. They also increased the mandated share of the state's energy mix that must come from the sun from 2.5% to 14.5%, a similarly lofty goal.

Climate activists who thought that would unleash a wave of new solar development in the state have been disappointed as disputes over siting have dogged many. Earlier this year, Mike Tidwell, director of the Chesapeake Climate Action Network, published an op-ed in *The Washington Post* complaining that more than 40 solar projects have been tied up in regulatory reviews and "red tape."

"I don't know how we're going to meet our solar [energy] goals," Tidwell said. "We've got to put solar somewhere."

Maryland Gov. Larry Hogan formed a task force last year to seek recommendations for "responsible siting" of renewable energy projects. In its final report issued in August, the panel noted that most of the solar projects under construction or review are on farmland, and it cited agriculture's economic and cultural importance to the state and the efforts made at public expense to preserve farmland from development.

Based on development trends to date, the task force estimated that utility-scale solar projects could consume anywhere from 7,750 to 33,000 acres of Maryland's farmland over the next decade. Up to 2.9% of the state's prime farmland could be lost, it estimated, because solar developers tend to favor flat terrain, which often has the most fertile soil for growing crops.

Maryland is losing far more than that to housing and commercial development. From 2007 to 2012 alone, bulldozers cleared nearly 15,000 acres of farmland and 19,000 acres of forest, the task force noted.

Even so, for at least the last few years, controversies over lost farmland and scenic vistas have challenged proposals for large ground-mounted solar projects from Washington County to the Eastern Shore, where its flat land is especially attractive.

Some counties have responded by trying to zone where such projects could be built or by limiting the overall number of acres of land that could be given over to photovoltaic panels. But under state law, the Public Service Commission regulates the siting of all solar projects more than 2 megawatts.

In response, state lawmakers have directed the commission to take local views into account. That's led to a regulatory backup, with dozens of projects waiting an average of 1.5 years to get a decision. A big part of the problem, solar developers say, is that the Department of Natural Resources power plant review program has withheld its recommendations to the commission unless or until projects get local approval.

The state's highest court last year ruled in a closely watched Washington County case that the state, not local government, has the final say. That hasn't ended the tug-of-war, though. A solar project proposed three years ago on 151 acres of Frederick County farmland won the commission's approval recently, even though it had been denied zoning approval by the county. The county has appealed the decision.

Even getting local approval is no guarantee that a project will move forward. Last year, the Maryland Department of the Environment blocked two projects in Charles County that together would have installed nearly 200,000 solar panels. The county supported both, but the MDE denied permits after birders and environmentalists objected to the loss of 400 acres of privately owned woodlands on the sites.

Conservationists contend there are plenty of better places to put solar panels. A recent report by the Chesapeake Conservancy found there were nearly 34,000 acres of "potential optimal sites" in Baltimore city and county alone on rooftops, parking lots and degraded lands. It found another 3,400 acres of open land it said could be used for ground-mounted solar without touching any prime farmland.

The conservancy report was underwritten by the Valleys Planning Council, which has fought for years to limit development in rural northern Baltimore County. "We went to all this trouble to protect farmland, preserve it and subsidize it," said Teresa Moore, the nonprofit group's executive director. "Now we're supporting another industry to come in and convert it?"

But solar developers say such "optimal" siting exercises are misleading because the number of places where PV arrays can be connected to the electrical transmission grid are very limited.

Plus, it can cost two to three times as much to put solar arrays on a brownfield, landfill or parking structure, said Cyrus Tashakkori, president of Open Road Renewables, a Texas-based developer of several projects in Maryland. New programs would be needed to make them commercially viable, he said.

The governor's task force laid out 14 recommendations for steering solar developers away from farmland.

Among other things, it suggested streamlining the permitting of rooftop solar projects and providing incentives such as tax credits and fee waivers. It also suggested requiring solar developers to offset the loss of any farmland they propose to use by preserving land elsewhere.

Andrew Cassilly, a senior adviser to Maryland's governor, said in a recent webinar that the task force report "has already drawn interest from some legislators."

Solar and climate advocates say the pathway to develop renewable energy projects needs to be smoothed out soon if Maryland is to meet its goals.

To meet its solar energy goals, the state needs to be adding 500 megawatts of electric generation capacity a year, said David Murray, executive director of the Maryland-DC-Delaware-Virginia Solar Energy Industries Association. Yet it's only adding about 200 megawatts annually now, he said.

"The year 2030 is not that far away," said Chesapeake Climate Action's Tidwell. "If we're going to get these projects developed and up, we can't have three, four or five more years of fighting like this." ■

Baltimore naturalist transforms neglected land into 'BLISS'

Green space fulfills vision of environmental and food justice

By Timothy B. Wheeler

Atiya Wells is leading the transformation of a neglected Baltimore park, along with two adjacent properties, into BLISS Meadows: a community hub for environmental education, outdoor experiences and healthy food production. (Dave Harp)

Growing up in Newark, NJ, Atiya Wells didn't really connect much with nature.

As an adult, though, she got hooked. She took her first hike with her husband after moving to Baltimore to start her pediatric nursing career. After their daughter was born, Wells began organizing hikes in area parks for preschool children. She also signed up for a self-paced naturalist course to help her identify what they encountered on their outings.

"I got so into nature," she recalled with a laugh. "The first thing I learned is that dandelions are edible!"

She noticed, though, as she enrolled in more outdoor education classes, that she was the only Black person taking or teaching them. That lack of diversity, she learned, is a legacy of the trauma Black people experienced when they were enslaved and of the violence visited upon them while outdoors then and since.

A few years ago, Wells set out to change that. She formed a nonprofit group, Backyard Basecamp, then launched BLISS Meadows, working to reclaim a 10-acre tract of mostly wooded land near her home in Northeast Baltimore. Her aim is to connect urban families — especially people of color — with the nature in their midst and empower them to explore further.

"I think having community green space is really important," she said. She also wants "to get more folks that look like me involved in outdoor education" and to learn about growing and eating healthy food.

All of those goals are coming together in BLISS (Baltimore Living in Sustainable Simplicity) Meadows. Wells said she discovered the site as she was searching for someplace close by where she could get outdoors regularly. Google Maps indicated that there was a city park she'd never heard of a few blocks from her home.

Walking there, she found an unmarked, untended nearly 7-acre patch of forest. It had been donated to the city sometime in the 1970s, she learned later, after plans to develop it fell through. Though officially a city park, nothing had been done with it lately, not even a sign identifying it as such. Trees grew where houses had been planned.

Hiking through the woods to its northern edge, Wells came upon a pond and a large, overgrown vacant lot. The two tracts seemed ideal to fulfill her vision for a community garden, environmental education center and a place for children to play and be in nature.

With help from Baltimore Green Space, a nonprofit group that promotes preservation of urban open space, she found and contacted the lot's owner, who'd originally wanted to build a community of tiny homes there. She persuaded him to let her farm it instead and use it for the outdoor programming she had planned.

She said she wants to re-instill the knowledge that "our grandmothers and great-grandmothers knew as far as edible medicinal plants go," but which has skipped a generation or two since. It's especially needed, she said, in the "food deserts" that exist in much of the city like her Frankford neighborhood, where grocery shopping options are limited.

Wells said she drew inspiration, insights and valuable tips from *Farming While Black*, the 2018 book by Leah Penniman that offers a how-to guide for African-heritage growers. That's where she first learned about pioneering Black agricultural scientist George Washington Carver, whom she had not been taught about growing up, she said.

Red-veined sorrel waits for harvest at BLISS Meadows in Baltimore. (Dave Harp)

"I wanted to have an organization that is based on recalling these stories and telling these stories to kids," she said. "They need something to look forward to, to see themselves as being great."

From dream to reality

Last year, Wells said she set her sights on an abandoned house on an adjoining lot and envisioned it as a year-round hub for classes and other activities to take place indoors when weather dictates. She crowdsourced a fundraising campaign that quickly brought in $60,000 to help buy it.

The coronavirus pandemic this year upset Wells' plans somewhat, forcing the cancellation of all programs at BLISS Meadows through spring and summer. She also began overseeing at-home learning for her children, ages 7 and 3, adding to a workweek already divided between BLISS Meadows and weekend nursing shifts at Mount Washington Pediatric Hospital.

Work went on at BLISS Meadows, though, to cultivate the land. With a grant from the Chesapeake Bay Trust, she hired a contractor to grade the meadow to improve stormwater drainage and carve out space for an outdoor amphitheater. It's planted in red clover now, in an effort to improve the health of the compacted soil.

The urban farming continued as well, with the bounty provided free to neighboring households.

On a recent visit, lush green rows remained of fall produce: red-veined sorrel, collard, kale and Swiss chard — guarded by an electric fence to ward off deer living nearby in the woods.

The last of the summer crops — peppers — was harvested recently from the garden, which is situated on a patch of ground that's rich in organic material from the earlier disposal of wood chips there.

Farmer Jordan Bethea, a volunteer who then signed on as a contractor for Wells'

nonprofit group, said he plans to survey the neighborhood before next spring's planting. He wants to refine the mix of crops to meet the preferences of local residents and "to make sure we are supporting each other."

"I've been getting very interested in what it takes to feed a community," Bethea said, as he took a break from installing animal-proof fencing around the base of the chicken coop. Like any farm, BLISS Meadows is vulnerable to losing chickens to nocturnal visits by foxes, which den in the woods nearby.

Besides deer and foxes, there have been sightings in the woods of red-tailed hawks, barred owls and a big black snake. There are two small ponds, created by a prior owner, one of which is dubbed Peace Pond, with a bench placed beside it for quiet contemplation. Goldfish swim in it, Wells said, and it's frequented by frogs and a box turtle. Plus, she said, "there's a great blue heron that stops by now and then."

To flesh out their environmental education programs, Wells has enlisted the help of Rose Brusaferro, an expert in sustainability education. Brusaferro, another volunteer turned contractor, said she's hoping to cut trails through the woods, set up an outdoor classroom and create a nature play space for children with a music station, mud-building station, balancing logs and a climbing area.

"With those three things, we can get rolling really well," Brusaferro said.

"Kids just need that time to sit and be and play with things, not really just hiking through," Wells added. "They want to look at every leaf and engage with every stick and just enjoy being outside."

Rose Brusaferro, BLISS Meadows' environmental education specialist, plans to create outdoor spaces where children can play and learn. (Dave Harp)

Forging ahead

Wells said she'd also like to set up a campsite in the woods, a place where Baltimore children and their families can learn how to pitch a tent and have one– or two-night sleepovers to help urban dwellers get comfortable with the idea of going camping.

To help remove underbrush in the woods, Wells said, they'll enlist BLISS Meadows' three Nigerian dwarf goats, named Lego, Loki and Bagel. "They cleared the spot where they're penned now," she said.

The forest work is still subject to approval by the city's Department of Recreation and Parks, which retains title to what's officially known as the Barbara and Parkwood Park, named for the streets it intersects. But the BLISS Meadows team has formed a park friends group recognized by the city and pledged to maintain the space.

"It's the only real park we have in our neighborhood," Wells noted. The next nearest, Radecke Park, is all ballfields.

Wells said she's also entered into a partnership with the National Park Service, which will provide technical help on planning for the woods and better serving the community's needs.

Despite the pandemic, Wells said BLISS was still able to offer gardening workshops and a bird-banding presentation.

"We grew potatoes this year," Wells said, "and one day the kids were helping Jordan harvest potatoes. It's become a real community green space, which is what we want it to be."

Next year, she said, they'd like to broaden the offerings to include teaching survival skills to neighborhood families, including making rope from yucca plants growing on the site and weaving baskets from the invasive English ivy they hope to uproot from the woods.

Wells also hopes to have a pair of beehives on site next year, to go with the orchard she wants to establish, building on the apple and pear trees already growing there.

Her next big challenge, though, is raising the funds needed to rehabilitate the house that she aims to turn into an education center. To achieve that using the high green standards she'd like to incorporate, could cost as much as $500,000. "We're almost halfway there," she said. "My goal is to have the house complete by this time next year. I think we can do it. But if not, we can do enough."

Within the next five years, she said, she'd like to start a Forest School at BLISS Meadows, a local branch of a national nonprofit dedicated to getting preschool children and their parents outdoors.

She's also got an eye on daylighting the buried, culverted stream on the property — the headwaters of Biddison Run, a tributary of the Back River that flows underground through the woods. She also wants to plant sugar maples, so children can experience tapping the trees' sweet sap and making syrup.

And she's angling to get the zoning changed for the property from residential use to "community open space farm," a designation that formalizes its current use.

"We hope this space lasts forever," she said. ■

Jordan Bethea works on fall crops in the community garden at BLISS Meadows in Baltimore. (Dave Harp)

Climate change expected to make Bay cleanup 10% harder

Impact data not available when setting 2025 numbers

By Karl Blankenship

It's long been known that climate change would make the job of cleaning up the Chesapeake Bay more difficult.

To be precise, it will be about 10% more difficult between now and 2025 than previously thought, at least according to new computer modeling. And the region's changing climate will continue to make things harder after that.

The findings were recently presented to leaders of the Chesapeake Bay Program, the state-federal partnership leading the Bay restoration effort, which is expected to approve the figures by the end of the year.

After that, states will have to start figuring out how to reduce the additional climate-driven nitrogen pollution — coming in at about 5 million pounds per year — on top of the reductions they are already struggling to achieve.

That's because climate change was not factored into the latest Bay cleanup goals, established in 2010. At the time, there was not enough information to quantify its impact.

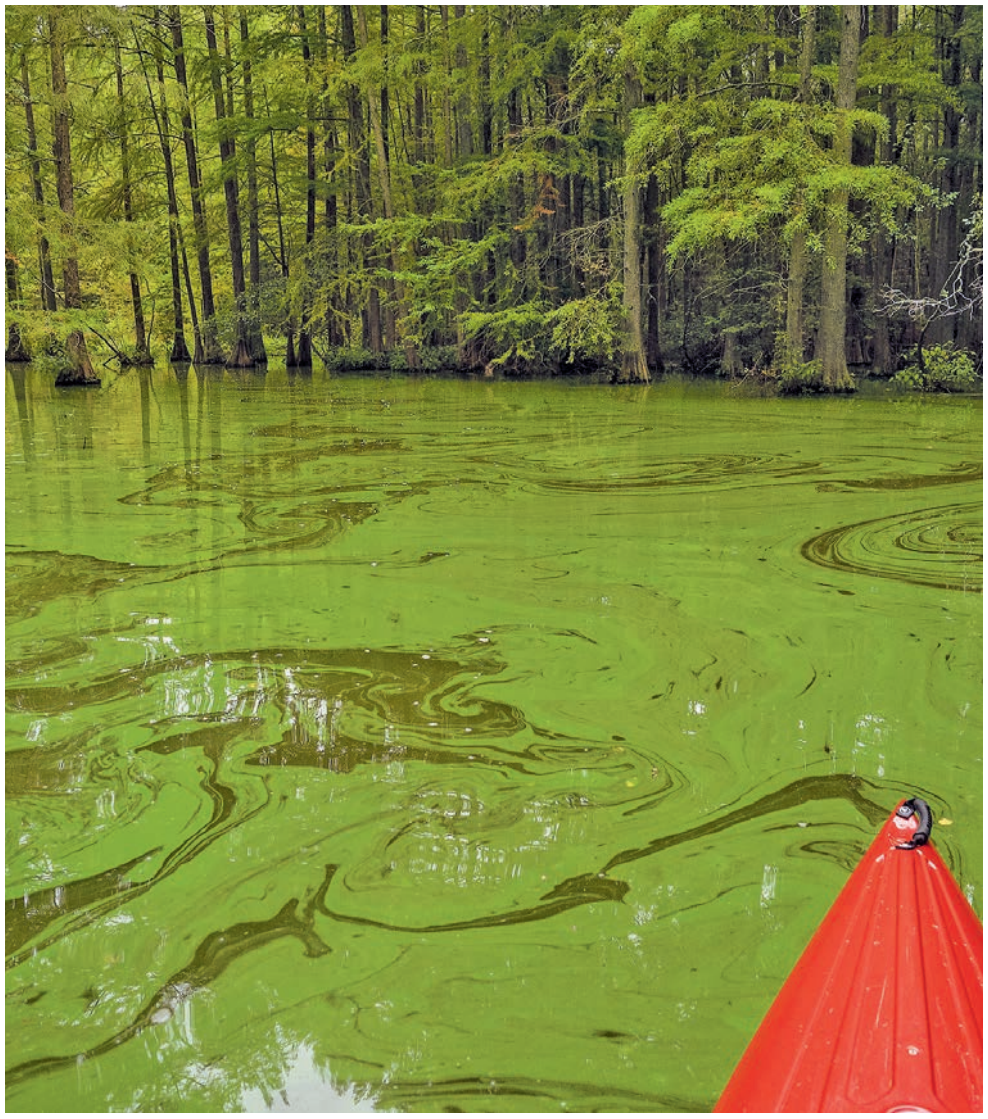
Since then, more research and analysis has shown that climate change has actually been impacting the Bay for decades, primarily because of a gradually increasing trend in rainfall that drives more nutrient pollution off the land and into streams and, ultimately, the Bay.

Those nutrients, nitrogen and phosphorus, cause algae blooms that cloud the water, blocking sunlight from underwater grass beds that are important habitat for fish, crabs and waterfowl.

When the algae sink to the bottom and die, they decompose in a process that draws oxygen out of the water, leading to summertime dead zones in deep areas of the Bay.

Nutrients largely originate from wastewater treatment plants, stormwater systems and manure and fertilizer applied to farmland. Reducing the flow of nutrients to the Bay by upgrading wastewater treatment plants or installing streamside buffers or cover crops that soak up excess nutrients has been the cornerstone of cleanup efforts for decades.

But the changing climate complicates the picture. The computer models used by the Bay Program to set the 2010 nutrient reduction goals relied on weather data from the mid-1990s to represent a "normal" range of weather conditions.



The nutrients nitrogen and phosphorus cause algae blooms that cloud the water. A gradually increasing trend in rainfall is driving more nutrient pollution off the land and into streams. (Dave Harp)

It turns out that much has changed since then. The Bay region is getting wetter on average, and more rain drives more nutrients from farms and lawns into the water. The Bay is changing as well. Warmer water temperatures can spur more algae growth, which reduces oxygen in the water and triggers the summertime dead zone.

Those changes, in effect, have been gradually offsetting the impact of nutrient reduction efforts since about 1995, but that change was not previously accounted for in models. When that is factored in, the new modeling shows that, by 2025, the Bay region will need to reduce more nitrogen than expected — 5 million pounds a year — to attain the same water quality goals.

Put another way, the Bay region previously needed to reduce the amount of nitrogen entering the Bay in an average year from about 251 million pounds now to 201 million pounds a year by 2025.

But when climate is added to the equation, instead of reducing nitrogen loads to the Bay by 50 million pounds a year, states now have to reduce it by 55 million pounds a year — a 10% increase.

Nitrogen is the nutrient that has been the most difficult to control — and the most problematic for the Bay. The region was not on pace to meet its nitrogen goals even without the added burden of climate change.

The good news is that, after making new data and model changes recommended by scientists, the newest estimate for annual climate-related pollution reductions is less than the 9 million pounds originally estimated in 2017.

But the new modeling raises a number of red flags about the future. The rate of climate change impacts on the Bay is accelerating. In the 10 years from 2025 and 2035, states will have to offset another 5 million pounds of nitrogen a year to keep pace with changing conditions.

"That means we will have as much of an impact from climate change in the next 10 years as we had in the past 30," said James Martin, Bay coordinator for the Virginia Department of Environmental Quality and co-chair of the Bay Program's Water Quality Goal Implementation Team. "That's scary."

State cleanup plans are supposed to be updated by the end of 2021 to show how they will offset the additional 5 million pounds of nitrogen to meet the 2025 goal. They are also supposed to develop a general explanation of how they will achieve the additional reductions needed by 2035.

But additional work may be needed to address two other potential climate impacts that could affect that equation:

- Preliminary modeling shows that climate change may have a greater impact on shallow areas and surface waters than previously realized. Historically, the Bay's nutrient reduction goals have largely been aimed at eliminating the deep water dead zone. But as water warms on the surface, it will hold less oxygen, so surface waters may not meet water quality goals either. Scientists want to further revise the models to better assess that impact, but it could mean even more nutrient reductions are needed in the future.
- Climate change may reduce the effectiveness of on-the-ground actions to reduce nutrient runoff. For example, increased rainfall associated with climate change may overwhelm stormwater control ponds or vegetated streamside buffers, reducing their effectiveness. Those impacts are not accounted for in cleanup plans. "That is not something we have resolved yet," Martin said. "I think it's reasonable to say, once we do account for that, it's going to make things harder."

Beth McGee, director of science and agricultural policy at the Chesapeake Bay Foundation, said she was pleased the Bay Program is requiring detailed plans from states for dealing with climate impacts anticipated by 2025. But, she said she wished it would ask for more than a general description about what they would do by 2035.

"If we had our preference, we would have had numbers, not just sort of a qualitative narrative about 2035," McGee said. "That said, we're happy that they've at least taken on 2025." ■

Offsetting nutrients passing Conowingo to cost $53 million a year

Biggest obstacle is who will pay to reduce sediment behind dam

By Karl Blankenship

The cost to reduce the added nutrient pollution spilling over the Conowingo Dam now has a price tag: at least $53 million a year.

That's the rough estimate contained in a draft strategy aimed at finding ways to offset the additional nutrients passing though the dam to the Chesapeake Bay, now that the dam's 14-mile long reservoir is filled with sediment.

The dam is located on the Susquehanna River in Maryland 10 miles upstream of the Bay. Most of the cleanup work proposed in the draft plan, released for comment Oct. 14, would take place upstream in Pennsylvania, primarily on farms.

The plan envisions attracting private investors to front the money needed to jump-start the work but said that will only happen if the states and U.S. Environmental Protection Agency commit to paying them back — something that has not happened so far.

Beth McGee, director of science and agricultural policy at the Chesapeake Bay Foundation, said she liked much of the proposed strategy, but said its success depends on whether the state-federal Bay Program comes up with a way to pay for it. "It's only a plan," she said. "If it doesn't get implemented, we're no better off."

The dam, completed in 1929, actually helped to reduce Bay pollution for decades by trapping sediments and associated nutrients. It's long been known that the reservoir would eventually fill, allowing sediment and nutrients to flow more freely into the Chesapeake. When the latest Bay cleanup plan was drafted in 2010, though, that wasn't expected to occur until after the 2025 deadline that states are striving to meet.

But that has already happened, and computer models estimate an additional 6 million pounds of nitrogen and 260,000 pounds of phosphorus now reach the Bay in a typical year.

That's enough to keep the Chesapeake's 2025 clean water goals out of reach.

With states already struggling to meet their individual pollution reduction goals, the Bay Program in 2018 decided to have an outside group develop a separate plan to offset nutrient increases from the dam and come up with a way to finance it.

The Susquehanna River flows through the Conowingo Dam, 10 miles upstream from the Bay. A draft strategy for reducing an increased load of pollution from behind the dam is open for public comment until Dec. 21. (Dave Harp)

Last year, the EPA awarded nearly $600,000 to the Center for Watershed Protection, Chesapeake Conservancy and Chesapeake Bay Trust to tackle the job.

"It's a massive lift," said Bryan Seipp, a watershed planner with the Center for Watershed Protection, who led the team. "It took decades and decades for this material to build up behind the dam. Trying to solve a problem that took decades to create in a fraction of that time is a challenge."

The team examined nearly a dozen options, some of which included actions outside the Susquehanna watershed that would achieve the same benefits to the Bay, before settling on the recommended strategy. Most of the other options cost more — one came in at $368 million a year.

The lowest cost strategy came in at $49.5 million dollars annually but relied solely on reductions from agricultural lands in the Susquehanna basin. Seipp said that raised concerns that an overreliance on agriculture would result in taking too much farmland out of production.

The selected plan focuses entirely on the Susquehanna watershed — primarily in Pennsylvania. It also identifies places where nutrient control actions would be most effective and suggests more than a dozen on-the-ground pollution control practices that would be the most cost-effective to implement.

The plan still relies mostly on agriculture, but also seeks a sliver of nutrient reductions from developed lands.

The strategy cautioned, though, that its estimated costs are "likely low." They do not include, for example, the cost of providing technical support staff to work with landowners on runoff control practices.

The draft also opened the door to other alternatives, such as dredging built-up sediment from behind the dam. Maryland is planning a pilot study to determine whether that is feasible.

It also raises the possibility of extending the deadline for meeting Conowingo goals beyond 2025.

Seipp said there is no firm timeline to issue a final strategy. That, he said, would hinge on public comments that may require plan revisions, as well as more clarity about funding.

A separate financing strategy will be released in December that is intended to identify ways to attract private money to support the plan.

That would spare cash-strapped states from having to pay up front and could speed implementation. But, the draft plan cautioned, "The only way that private investors will make money, at least in the near future, is if the public sector is compelled, for whatever reason, to pay them back for their investments."

Although states in the watershed chipped in funding to help develop the plan, there has been no commitment about who would ultimately pay for the actual work.

The team writing the financing strategy said in a Sept. 23 memo that it assumes the Bay states "will have the ultimate responsibility" for funding the plan. Without that commitment, it said, implementation "will be very limited in scale and impact."

Some state officials have hoped that other funding mechanisms will arise, such as philanthropic support that doesn't need to be paid back. But efforts to lure outside money have been elusive.

At the time that the Bay Program agreed to create the Conowingo plan, state and federal officials were hoping that a settlement between Maryland and Exelon — the utility that owns the dam — would generate tens of millions of dollars a year for the cleanup. The utility needs approval from the state before it can get a new federal license to operate the dam.

Earlier this year, though, the state and Exelon struck a deal that committed just $19 million over the 50-lifespan of the license for that purpose. Some environmental groups and lawmakers have sought to block that agreement from being finalized.

"We still think that they should be held accountable for their downstream impacts, and we would love to see some of their dollars go upstream as opposed to what's currently in the settlement agreement," McGee said.

The draft Conowingo Watershed Implementation Plan is open for comment until Dec. 21. Comments should be submitted to CWIP@chesapeakebay.net. Read the plan at chesapeakebay.net/who/group/conowingo_watershed_implementation_plan_steering_committee. ■

Hope for hemlocks: New tactics found to fight deadly pest

One of Appalachia's most important tree species may yet be saved

By Ad Crable

The Evergreen Trail winds among towering hemlocks at Ricketts Glen State Park in Pennsylvania. (Dave Harp)

Several new scientific discoveries give hope that eastern hemlocks will not go the way of chestnut, elm and ash trees and largely disappear from forests in the Chesapeake Bay watershed.

Hemlocks are one of the most prevalent, longest-living, beautiful and ecologically vital trees in Appalachian forests. Sometimes called the redwoods of the East, they can take 250–300 years to mature and live more than 800 years.

They also have a long history with humans. Native Americans used hemlocks for medicines. Settlers used the tips of branches for tea and as a dye for wool and cotton. The mountains of Pennsylvania have ghost towns where leather factories sprung up to receive the tannin from hemlock bark to turn animal skins into leather. The trees' intense shade cools streams and supports fish habitat. And many homeowners still want hemlocks in their landscaping tableaux.

"As a kid I used to climb a local hemlock just to sit in the branches, swaying with the tree. It was the only place I could sit with myself, uninterrupted," a Pennsylvania woman said.

But for 40 years, the old denizens of the forest have been under relentless attack from woolly adelgids — rice-sized, aphid-like insects native to Asia. Here, there are no natural enemies to keep them in check. They continue their advance west and north by about 8 miles a year and have infected about half of the eastern hemlock's range.

So far, the tiny invaders have killed millions of hemlocks from Georgia to southern New England. Some of the hardest-hit areas are south of the Chesapeake region, but Pennsylvania, Virginia and West Virginia have suffered heavy mortality.

Hemlocks once dominated the forests of Pennsylvania, where the hemlock is the state tree, along with chestnuts and white pines. Now, adelgid infestations have been found in 64 of 67 counties.

"Without intervention, most trees in natural settings will die," according to the state's latest Eastern Hemlock Conservation Plan.

There still are an estimated 124 million hemlock trees greater than 5 inches in diameter alive in Pennsylvania. But that's nearly 13 million fewer than in 2004 and the mortality rate has increased fourfold since 1989.

In Pennsylvania's Tuscarora State Forest, the Hemlock Natural Area, a 120-acre stand of virgin hemlocks "untouched by man" is now gone, touched by insects.

In Virginia, the Limberlost grove of hemlocks, oldest in Shenandoah National Park, is now a graveyard of felled giants.

In Maryland, the hemlocks in Cunningham Falls State Park have been wiped out.

But now, forest managers have some reason for hope. Among them: the discovery of adelgid-resistant survivor hemlocks in New Jersey, a successful crossbreeding project to produce more adelgid-resistant trees, and the introduction of two new insects that feast on adelgids.

"This is one pest we're having success at [defeating]," said Craig Kuhn, who heads the forest pest management section of the Maryland Department of Agriculture.

Holding the line

It's been nearly 70 years since the tiny, voracious, mass-producing woolly adelgids were first found on hemlocks imported from Japan to beautify the Gilded Age Maymont estate outside of Richmond. The pest may also have been introduced to three other estates in the East and South between 1910–15. The insects were first found in Pennsylvania in 1967 and Maryland during the 1980s. By then, adelgids had begun marching up and down steep ravines, mountainsides and people's yards.

Adelgids kill by inserting their mouth parts into twig tissues near the base of needles. This feeding consumes plant sugars needed by the tree. Most people recognize adelgids by the white wax-like substance they secrete around their bodies.

Woolly adelgids, which feed on hemlock branches, secrete a telltale white foam-like substance around their bodies. (USDA Forest Service)

Mass feeding by adelgids typically kills a hemlock in four to 15 years. Others keep living but in a moribund state. "They'll just start looking like lollipops with just tufts of needles on the top and the rest dead," Kuhn said.

Forest and park managers have bought time by injecting insecticides into the tree or surrounding soil. That protects the most visible, historic and popular hemlock trees along trails, in parks and along streams where the trees create a unique "microclimate" that dozens of animals, birds and insects depend on.

Native brook trout especially need water cooled by shade from overarching hemlocks, and their disappearance threatens efforts to save the wild trout. Trout are three times more likely to occur and four times more abundant in streams draining hemlock forests than those draining hardwood forests. For this reason, Pennsylvania state forestry crews treat some hemlocks along at-risk streams.

But because of cost and accessibility, chemical protection in Bay states is mostly reserved for the hemlocks most seen by the public.

The chemical effort has saved hundreds of

A worker in Pennsylvania injects insecticide into the ground at a state park to save an old-growth hemlock tree from being attacked by woolly adelgids. (PA Department of Conservation and Natural Resources)

majestic hemlocks in Pennsylvania's Cook Forest State Park. The Forest Cathedral stand there draws tens of thousands of visitors each year. The grove, a National Natural Landmark, has the oldest hemlocks in the East; some almost 400 years old.

In all, 146 stands of hemlocks are chemically treated in the state.

In Western Maryland, at Swallow Falls State Park, home to the state's most popular hemlock stand, as many as 3,000 trees are chemically treated to keep them alive and robust.

But millions of trees in Bay states have been killed or weakened.

New tactics

Meanwhile, a cooperative effort among scientists, land managers and other advocates has been pushing for more solutions.

Along with the federal government, they formed the Hemlock Woolly Adelgid Initiative in 2003. The coalition now includes four federal agencies, 20 state agencies, 24 universities, seven institutions in China and nine private industries in Japan.

The first pushback involved capturing and releasing several predatory beetles that feed on adelgids. One species was from the Pacific Northwest. Another species, a pin-size type of ladybug, came from Japan.

From 1999 to 2011, more than 2.5 million Japanese ladybugs were released in 15 eastern states. But the insects tended to fly away from targeted hemlock stands.

Two other species of beetles have fared better since releases began in 2005. Established colonies are killing about 30–40% of adelgid eggs sacs, said Scott Salom, a professor of entomology at Virginia Tech, who has studied the biological control of adelgids for 22 years.

Unfortunately, adelgids have two distinct life stages. And because the beetles do not feed in late spring, the wounded adelgid populations have a chance to bounce back.

Enter two species of silver flies that are found on hemlocks in the U.S. West and consume adelgids in the spring. Since 2015, the silver flies have been released in controlled settings throughout the East.

Though still being studied to make sure they don't negatively impact native insects, there is hope that the flies may be the missing link in the biological control of adelgids — and the long-term strategy for saving hemlocks.

"It looks promising because it nails the part of the life cycle [that beetles] don't get to," said Donald Eggen, forest health supervisor for the Pennsylvania Bureau of Forestry.

"The great hope is that the silver flies paired with [the beetles] is the one-two punch," said David Mausel, a regional entomologist with the U.S. Forest Service.

Optimism also is buoyed by experiments with healthy hemlocks found in New Jersey among an otherwise devastated hemlock grove infected for more than 30 years.

In 2015, eight resistant trees grown from cuttings of the healthy trees and four susceptible hemlocks were planted in the wild in seven states, including Pennsylvania, Maryland, New York and West Virginia.

After four years of study, scientists reported that 96% of the "bulletproof" trees survived, compared with only 48% of susceptible trees. The test trees also grew faster and retained more foliage.

Though some scientists want to grow more test trees and perform more monitoring, many in the fight to save hemlocks think that adelgid-resistant trees could eventually help reforest stricken stands.

Similar tests have started in Virginia's James River State Park.

Another recent development is the successful production of a hybrid hemlock by crossing adelgid-resistant hemlocks from China with native Carolina hemlocks, which grow in the southern Appalachians, including parts of Virginia.

Greenhouse trials of the hybrid occurred at the U.S. Department of Agriculture's Beltsville Agricultural Research Center in Maryland. Now, research is focused on determining if the hybrids will grow in the range of the eastern hemlock. Attempts to cross Chinese hemlocks with eastern hemlocks were not successful.

Scientists warn that the main use of these hybrids may be on residential land. Most nurseries don't sell eastern hemlocks anymore because of the risk of infection.

And because the hybrids grow slowly and must be reproduced from cuttings, they may not play a major role in restoring hemlock forests. And in those wild settings, Salom said, "You want the eastern hemlock. It's just not the same tree."

A loss that hits hard

Aesthetically, the loss of stately eastern hemlocks would be missed. But the biggest impact would be on the environment. Their deep shade, cool temperatures, water-cleansing ability and slowly decomposing trunks create unique microclimates.

It's a critical habitat for many terrestrial and aquatic species. Nearly 96 bird species and 47 mammal species are tied to hemlock forests, not to mention insects and amphibians like salamanders. There are unique lichen and plant communities that dwell among the hemlocks.

And wild trout. Because hemlocks store and slowly release water, scientists warn that marginally coldwater streams may dry up if they lose their hemlock buffer.

Attempts to replace dead hemlocks with fir, spruce and pine trees, or rhododendrons, have proven that they are inadequate substitutes. "It's got a specialized niche in our forest that is irreplaceable," Salom said.

If being attacked by insects isn't enough, warming global temperatures are another threat to hemlocks, because cold weather helps to kill off adelgids.

Those involved in fighting for hemlocks' survival often harbor a soft spot for the tree.

"It's way more than a timber species," stressed Mausel of the U.S. Forest Service, who considers hemlocks important for everything from holding tree stands for hunting to writing poetry. "The U.S. Forest Service remains committed to the sustainability of hemlocks, and the next 20 years are as important as the last 20 years."

Eggen added, "When you walk through a hemlock forest, you are experiencing a unique habitat that is only found in a hemlock forest. Many of those large hemlocks are hundreds of years old. It's like walking through history. "When you walk through a place like that, I know why we do what we do. This is what I'm trying to protect."■

BIG HEMLOCKS & WHERE TO FIND THEM

- Cook Forest State Park, Cooksburg, PA. The Forest Cathedral Natural Area has the largest concentration of virgin and old-growth eastern hemlocks in the East.
- Swallow Falls State Park, Oakland, MD. The 40-acre grove of hemlocks is Maryland's largest, with some trees more than 360 years old.
- Gunpowder Falls State Park, Manchester. MD. The Hemlock Gorge Trail loops through ravines and hemlocks.
- James River State Park, Gladstone, VA. Hemlocks will be on either side as you approach the Tye River Overlook. Once there, go down the stairs to the equestrian access point for a short hike through a hemlock grove.

Kitchen Creek at Ricketts Glen State Park, PA, flows through a stand of hemlocks. (Dave Harp)

‘We have to pivot’: Environmental ed during COVID-19

Nonprofits strive to serve students while fighting for their own survival

By Jeremy Cox

Annapolis Maritime Museum instructor Kamora Turner, right, inspects a composting bin with Kukas Rott, Ellie Kennard and Derek Albensi. (Dave Harp)

With a deadly pandemic racing across the country and beginning to surface in the surrounding community last spring, the tiny Maryland nonprofit that operates one of the Chesapeake Bay’s last skipjacks shelved its 2020 sailing season.

No public tours. No private charters.

Forgoing a year’s worth of ticket sales was no easy call. But for Pat Johnson, the Dorchester Skipjack Committee’s president and a primary care physician, it was necessary. Physical distancing isn’t possible on a boat, and most of the volunteer crew is of retiree age, putting them in a high-risk category, she said.

And what about next year? “It’s not quite clear how we’ll operate by then, either,” Johnson said. “The hope is we get through the winter, and there’s a vaccine on the other side that people may want to take.”

As the COVID-19 crisis lurches toward 2021, environmental education organizations like Johnson’s are scrambling to reinvent themselves across the Chesapeake Bay watershed. Some have significantly scaled back in-person gatherings while others have shunted their outdoor lessons into the virtual world.

And then there are those like the Dorchester Skipjack Committee, which have simply decided to wait out the virus. Johnson said her nonprofit has survived on emergency grants. Members have tried to stay productive during the downtime by training new crew members and refurbishing the skipjack.

Not every group may be so financially flexible, she cautioned: “I am fearful that a lot of these organizations will succumb to financial issues.”

‘We have to pivot’

At the Annapolis Maritime Museum, restarting programs was a matter of financial survival. After the lockdowns canceled events in the spring, the organization’s four educators began retooling operations to conform with new social-distancing rules.

“We have to pivot,” said Alice Estrada, the museum’s president and CEO. “We’re trying to keep them gainfully employed, so we’re trying to figure out what we can do.”

The museum obtained state and local permission to operate its annual summer camp. Instead of 40 children milling around together, they restricted groups to no more than 10 children and kept the groups separated.

Before the pandemic, Estrada said, the nonprofit was exploring the possibility of offering daycare services. The organization has fast-tracked the idea and plans to make the service available this fall.

In few places has the shift been more tangible than at the Chesapeake Bay Foundation.

The foundation also has been working since spring to convert outdoor-oriented programs to a virtual environment — just on a larger scale than most groups. The nonprofit runs one of the biggest environmental education programs in the country, reaching up to 35,000 students and 400 teachers a year across much of the Bay watershed.

“Is it the same as being able to paddle on the Potomac River or visit Smith Island? Or be able to pull up a crab pot yourself? It’s not. But we feel we’re creating the best learning environment we can with the opportunity we have,” said Tom Ackerman, the foundation’s vice president of education.

One of the main funding hubs for environmental education and teacher training efforts in the Chesapeake region is the National Oceanic and Atmospheric Administration’s Bay Watershed Education and Training (B-WET) program.

This year, the agency handed out about $2.6 million to nearly two dozen projects across the Chesapeake’s 64,000-square-mile watershed. The program strives to offer students what officials call “meaningful watershed educational experiences.” That can be accomplished through classroom learning and outdoors activities.

After the coronavirus lockdowns rolled out over the spring, NOAA officials learned that some grant recipients had no choice but to halt programs and postpone grant deadlines. Others soldiered on, switching to online formats.

For example, the Maymont Foundation, a nonprofit that operates a historic estate and park in Richmond, VA, had planned before the quarantine to have students apply environmental skills around their schools’ properties. When its educational partner, Henrico County Public Schools, shut its doors last spring, plans were dashed for pollinator gardens, rain barrels and other hands-on assignments.

Instead, the foundation allowed participants to work in parks, neighborhoods or their own backyards. Among the projects that sprang up: testing a stream’s water quality, picking up trash and creating a backyard butterfly habitat.

Such instances of on-the-fly alterations show “the creativity, dedication and resilience of environmental educators,” said Shannon Sprague, environmental literacy and partnerships manager for the NOAA Chesapeake Bay Office. “They are used to finding ways to offer their programs to meet the needs of the schools and teachers they serve, and changes due to COVID-19 are just one more example of their wonderful ability to adapt.”

For some educators, creativity may not be enough.

Broadband internet has become an educational lifeline, allowing many students to see and interact with teachers from afar. But in some places, where households lack access to the internet or service is poor, educators have been seeking out old-school alternatives.

“The digital divide is real,” Ackerman said.

To deal with the dilemma, the Bay Foundation’s educators have created worksheets, pamphlets and other printed materials for students and teachers who can’t access the internet.

Real-world lessons are few

Some organizations have restarted in-person programming; it just looks different. The Nature Conservancy, which owns or protects more than 40,000 acres of land on Virginia's Eastern Shore went forward with field trips during a teacher-training program over the summer. But there were several changes: a reduction in group sizes from 10 to 6, temperature checks, individual snack packages, mandatory mask-wearing and no sharing of life jackets.

Under a $100,000 B-WET grant issued long before the pandemic, the conservancy is also responsible for supplying environmental education to fifth, seventh and 10th graders in Accomack and Northampton counties. Although schools have reopened under a hybrid setting, field trips remain off the table. In the interim, the group has been recording nature videos for students to watch at home or in the classroom and coupling them with activities.

Margaret Van Clief, who oversees the conservancy program, said her biggest concern is getting students excited about the environment from a video or a booklet. That's usually a given when students ride in boats or go stomping through the muck.

"They get excited. They get mud on their faces and all that," Van Clief said. "So, the real challenge is how to get that level of passion in a virtual environment."

It's all but impossible to quantify the impact of losing a year or more of outdoor education. But the list of cancellations is staggering.

At the Merrill Linn Conservancy, a nonprofit land trust based in Lewisburg, PA, organizers called off, among other things, an environmental film showing, a paddling expedition on Buffalo Creek, a birds of prey presentation, a streambank planting project and a family-friendly fossil dig that drew 500 attendees last year.

"There's a bit of a loss to the community," said Geoff Goodenow, the group's coordinator. "I'm not sure that the loss is widely felt, but for those that have participated in those events in the past, I think they are missed."

For decades, the Montour Preserve near Danville, PA, has hosted an annual event in which staff members tap maple trees, collect the sap and demonstrate how syrup is made from it. The 2020 Maple Sugaring proceeded without a hitch on its first day on Feb. 29. But by the second weekend of activities in mid-March, it became an early casualty of the quarantine.

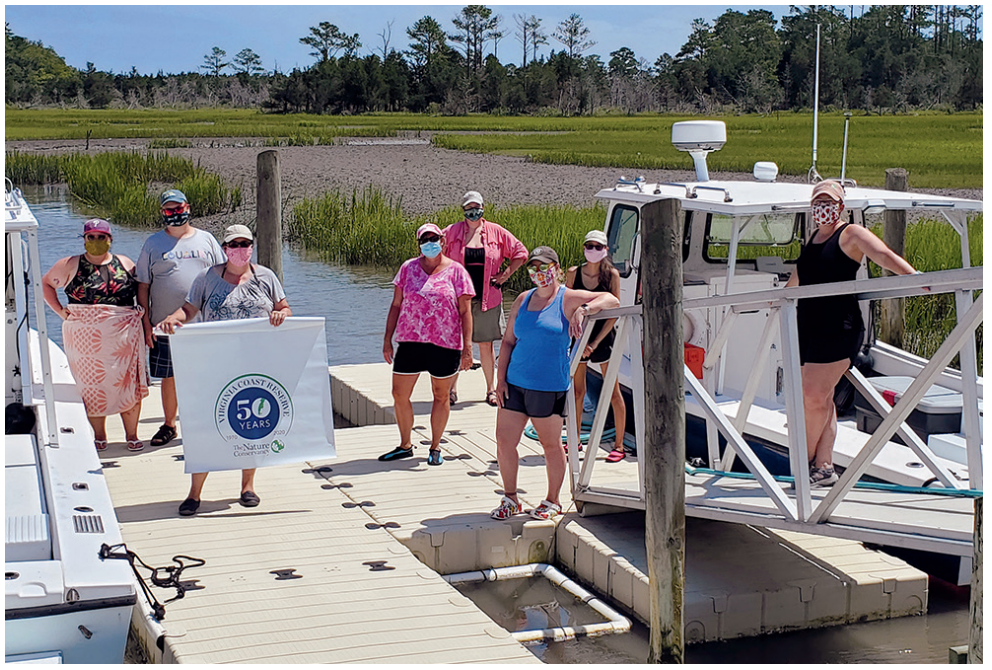
"It was not an easy decision because we do have people come year after year," said Jon Beam, assistant director of the not-for-profit that oversees the 600-acre recreation and fishing space. "But it was better to be safe than sorry."

Because the preserve's operations are partly funded by a local hotel tax, income has fallen amid the decline in travel. A parking lot resurfacing and painting the picnic pavilions were among the first projects on the chopping block, Beam said.

Will there be a 2021 Maple Sugaring? "I wish I could answer that," he said. "I don't know."

In Talbot County on Maryland's Eastern Shore, where the horizon is typically dominated by corn stalks and soybean

Katey Nelson of the Annapolis Maritime Museum, teaches youth about composting. (Dave Harp)



Teachers who completed a week-long training session with The Nature Conservancy pose with conservancy staff by Upshur Creek in Accomack County, VA. (© Marcus Killmon/The Nature Conservancy)

bushes, the 400-acre Adkins Arboretum is a forested oasis. The pandemic delivered a double blow to the nonprofit. It had to shut down its youth programs, and because its visitor center was closed, its leaders decided to waive admission fees to trails and outdoor exhibits.

"We're a very small nonprofit," assistant director Jenny Houghton said. "We don't get any funding like state parks get. Our income comes mostly from program and event fees, grants and membership. It was a lot of income that we didn't get this year."

Inside or outside

Because field trips have all but vanished, some virtual lesson plans invite students to experience nature around their homes or their neighborhoods. But that poses its own set of problems, said Laura Johnson Collard, executive director of the Maryland Association for Environmental and Outdoor Education.

"A high school teacher can't say, 'Go look under leaves and see if you can find monarch [butterfly] cocoons,'" she said. "There's a risk associated with telling a child to go outside without having a parent being involved in the decision."

And in some communities, it may be too risky to go outside because of the amount of crime in the area or the home's proximity to heavy traffic. In such cases, Johnson Collard recommends that educators give children activities that involve looking out their windows. They can count birds or describe changes in the seasons.

"Looking out a window, you can still connect with nature," Johnson Collard said.

Can children learn about the environment on their own? Or at least mostly on their own? Meghan Goldman hopes it can be done.

The Loudoun Wildlife Conservancy educator said she is avoiding online tutorials and other virtual programming as much as possible because she views screen time as anathema to the outdoors experience.

Because she can't host in-person gatherings, among the ideas she has in development is what she calls "nature play boxes." The youth and family program coordinator with the Leesburg, VA,-based nonprofit is stocking the boxes with objects such as funnels and chalk. She plans to deliver more than a dozen to local disadvantaged families. The only instructions are diagrams demonstrating ways that the boxes' contents can be used — perhaps building a fort or a mud-pie kitchen. Goldman hopes that children will bring the items outside and make their own fun.

"I'm trying," she said. "We'll see how it works." ■

Connect with environmental educators & resources

- MD Association of Environmental & Outdoor Education (maeoe.org), conference Feb. 4–7
- PA Association of Environmental Educators (paee.net), conference Mar. 22–23
- VA Association for Environmental Education (vaee.wildapricot.org), mini-conferences on Feb. 20, July 17, Oct. 23

Bay Commission marks 40 years of collaborative cleanup

Amid disputes, interstate panel nurtures state partnerships

By Timothy B. Wheeler

Rancor and partisan bickering may be de rigueur in politics these days, but the Chesapeake Bay Commission abides in a bubble of amicable collaboration.

Now completing its fourth decade in existence, the 21-member commission has brought Democratic and Republican lawmakers together from Maryland, Pennsylvania and Virginia to seek solutions to the Bay's daunting array of problems.

The commission's current chairman, Pennsylvania state Sen. Gene Yaw, calls it a "unique" body unlike any he's ever been associated with. He said he's formed friendships with members from other states, backgrounds and political affiliations.

"I have never heard politics mentioned," said Yaw, a Republican. "It's nonpartisan. I couldn't even tell you the party relationship of the majority of people." He called the experience "refreshing and rewarding."

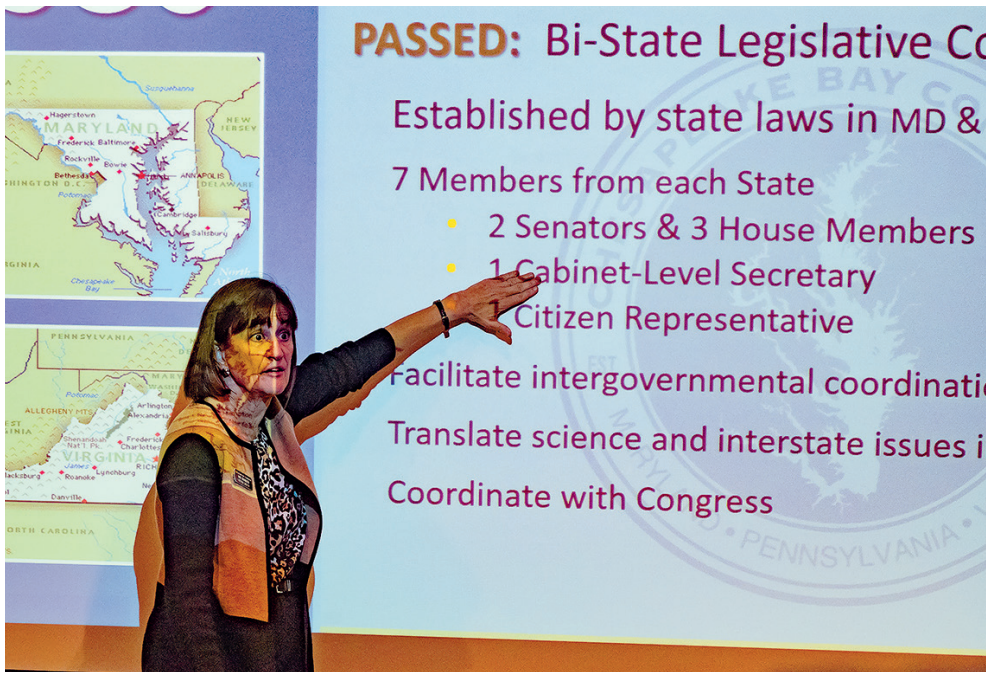
The tri-state legislative advisory commission has played a pivotal role in the long-running Bay restoration effort. It sponsored the initial summit of state and federal officials in 1983 that formally launched the Bay cleanup campaign. And, it has been a signatory of every Bay agreement, representing the states' legislatures.

Over the last 40 years, hundreds of state legislators of both parties, cabinet secretaries and citizens have served on the commission. They have cooperated to draft and champion the passage of dozens of Bay-related laws and to press for adequate state and federal funding for the restoration effort.

"The commission has been very active, very forward thinking in dealing with the problems of the Bay," said Tayloe Murphy, Jr., who served a record three times as its chairman while a member for 22 years, first as a Virginia state delegate and later as state secretary of natural resources.

"The members have not always been as successful as I would have hoped with their legislatures," Murphy added. But without the commission, he concluded, "we wouldn't have been as successful as we have been."

Now, it faces perhaps its most difficult challenge, as states struggle to meet the 2025 deadline for putting in place the laws, programs and funding needed to restore the Bay's water quality. Pennsylvania has fallen far behind the pace needed to reach that goal, prompting criticism from environmentalists and lawmakers in other states — and a pair of lawsuits against the U.S. Environmental Protection Agency trying to force it to take action against the state.



Ann Swanson, who has served as executive director of the Chesapeake Bay Commission since 1988, briefs an audience on the commission's structure, history and achievements. (Dave Harp / 2019)

The controversy hasn't intruded on the collegial ethos of the commission, at least so far.

"Our approach is to work together to solve the problem and not to criticize each other," Yaw said.

The commission grew out of a bi-state legislative advisory committee formed in 1978 by Maryland and Virginia lawmakers. Two years later, they formally established it, and Pennsylvania joined in 1985. Each state has seven members: five legislators, a representative of the governor and a citizen.

Early work on fisheries

Early on, commissioners focused on resolving conflicts between Maryland and Virginia watermen over fishing across state lines, disputes where at times, shooting erupted.

One of the commission's first legislative wins was a ban on phosphate detergent aimed at reducing the amounts of phosphorus getting into the Bay, where it contributed to algae blooms and fish-stressing "dead zones." Maryland lawmakers passed the ban in 1985, followed two years later by Pennsylvania and then Virginia two years after that.

The same pattern played out with getting farmers to practice nutrient management, with each state legislature acting in its own way to limit growers' use of nitrogen and phosphorus fertilizer so less would run off their fields and foul the Bay. Maryland and Virginia also passed somewhat different measures intended to curb the impacts of shoreline development on the Bay's water quality.

Other times, legislation drafted or supported by the commission has passed in just one or two states, rather than all three. Such has been the case with a bill to restrict the application of residential lawn fertilizer, which passed relatively easily in Maryland and Virginia but has yet to get through Pennsylvania's legislature.

Current and former members credit much of the commission's success to its long-serving executive director, Ann Swanson, who's led the group since 1988.

"She's so studied and dogged," said John Griffin, a former Maryland natural resources secretary who served on the commission. One of her greatest strengths, he said, is her ability to deal with the differing personalities and political affiliations of the commission's shifting cast of members.

Swanson, in turn, deflects the credit to the commission members themselves. Many serve multiple years, she noted, and through their exposure to the issues and the science behind the Bay restoration, they become advocates regardless of political persuasion.

"It's the staff's job to understand the facts and some politics, and the members' job to understand the politics and some facts," she said. "When the members and staff come together it can be a powerful situation."

One of the commission's signal achievements came in the 1990s. Amid friction between Maryland and Virginia over the economically important blue crab fishery, the commission formed a bistate advisory committee that brought together legislators, watermen, scientists and fishery managers to hash out differences.

Pennsylvania Sen. Gene Yaw, chair of the Chesapeake Bay Commission (center), talks with commission vice chairs Guy Guzzone (left) of the Maryland State Senate and David Bulova of the Virginia House of Delegates. (Dave Harp / 2019)

Tayloe Murphy of Virginia, a member of the Chesapeake Bay Commission for 22 years, speaks during a commission meeting in Baltimore. (Dave Harp/2019)

Swanson chaired a workgroup of scientists and economists that over eight years helped to guide the states to an agreement to rely on science and to manage crabs as one fishery across state lines.

'A wake-up call'

The commission has also advocated repeatedly for getting adequate state and federal funding for the Bay and for ensuring that the funds are spent where they're most needed or will do the most good.

In 2003, it published an eye-opening report estimating the cost to restore the Bay's water quality to a healthy level — $18.7 billion over the next eight years. That's about $13 billion more than the Bay watershed states and federal government had put up so far.

"It was a wake-up call," said Russ Fairchild, a former Pennsylvania state representative who was the commission's chairman at the time. "But with that we were able to go to our respective states and leadership, and we could start to talk turkey with them."

The results have been uneven. In 2004, Maryland approved a Bay Restoration Fund financed with fees on utility bills and septic systems, which has poured $1.6 billion into upgrading the state's sewage treatment plants, and more than $500 million into runoff pollution control measures, paid for through gasoline and car rental tax revenues.

Virginia has spent more than $900 million via a dedicated water quality improvement fund to upgrade its sewage infrastructure, the commission reports.

There's been less success in Pennsylvania. Lawmakers in 1999 approved the creation of a Growing Greener program to dole out $650 million for everything from farmland preservation to park improvements and water and sewer upgrades. But chunks of that money got diverted for other purposes, and Pennsylvania officials have since estimated that the state will need to increase spending by $300 million a year to reduce nutrient and sediment pollution in its rivers and streams enough to meet the state's Bay restoration obligations.

Pennsylvania members of the commission have tried without success the last several years to persuade their legislature to approve a dedicated funding source for the work.

This year, Yaw sponsored a bill that would have created a program to help farmers pay for conservation practices.

But it, too, failed to pass, as the COVID-19 pandemic hammered the state's economy.

Yaw acknowledges that increasing funding for Bay cleanup has been a tough sell in Pennsylvania. The state doesn't border the Bay and, though half of its land is drained by the Bay's two largest tributaries, the Susquehanna and Potomac rivers, only 30% of the population lives in the Bay watershed.

Adjusting the pitch

Swanson and Pennsylvania members of the commission have adjusted their pitch to the state's lawmakers to stress that addressing pollution close to home will help the Bay. More than 25,000 miles, or 30% of the state's rivers and streams, fail to meet water quality standards, according to the latest assessment by the state Department of Environmental Protection.

"If we just take care of our own clean water, we don't have to worry about what happens downstream," Yaw said. "That will take care of itself."

That message hasn't carried the day so far, and Pennsylvania has faced increasing criticism from environmentalists and elected officials from other Bay states.

This year, Maryland and Virginia took it a step further. They joined in filing one of two lawsuits — the other was brought by the Chesapeake Bay Foundation — accusing the EPA of neglecting to move against Pennsylvania and New York after both fell short on their latest Bay cleanup plans.

Yaw said the lawsuits and criticism have made it even harder to win votes for Bay legislation in Harrisburg.

"There are people out there who say, 'Fine, they want to sue us? We're not doing anything,'" he said. "It's one additional hurdle we have to overcome."

Maryland state Sen. Sarah Elfreth said she's come to understand, after more than a year on the commission, the challenges Pennsylvania lawmakers face. For one thing, they have to deal with more than 2,500 cities, boroughs, towns and townships, she noted.

Even so, Elfreth said, "I want to be clear. They need to be doing more. But we have to deal with where they are."

Thinking outside the box

The commission has joined others in pressing for more federal money to help Pennsylvania. But they've also talked about funneling money to the state from its neighbors.

"Watersheds and water do not respect arbitrary state borders," Elfreth said. "I think our solutions ought to be more regional."

Spending Maryland taxpayers' money in Pennsylvania could also be a hard sell. But Elfreth said, "To not at least have that conversation is a disservice to the Bay."

Yaw said he's encouraged by such thinking outside the box and thinks it may sway Pennsylvania legislators to increase funding if other states are offering to help.

Swanson acknowledges that she's frustrated by the repeated failures to get Pennsylvania lawmakers to approve a dedicated fund for improving water quality. But commission members "know not to give up," she said.

"We always have to take conservation in measured steps," she said. "We cannot get too far out in front of the public or the champions lose their jobs. And if the champions lose their jobs, then we lose progress toward our goal line." ■

Maryland Sen. Sarah Elfreth, a member of the Chesapeake Bay Commission, said the commission has helped her to better understand the challenges Pennsylvania lawmakers face. (Dave Harp/2019)

New recipe: Fish consumption advisory substitutes safety for scare

Outreach to Anacostia anglers aims for more effective health message

By Jeremy Cox

A young visitor at the 2018 Festival del Rîo Anacostia tastes fish that was prepared in a cooking demonstration aimed at promoting safer preparation and consumption of fish from the polluted Anacostia River. (Michelle Williams / Chesapeake Research Consortium)

Despite longstanding government alerts about the potential dangers of eating fish caught in the Anacostia River, some anglers aren't getting the message. Part of the disconnect, it seems, lies in the ways agencies and organizations have shaped their warnings.

Communications staff at the Chesapeake Bay Program, the state-federal partnership leading the Bay restoration effort, has been testing a very different strategy over the last few years. Instead of scaring people away from fish consumption, the effort has encouraged them to catch and eat the fish — but more safely. And they are sharing that message, geared toward a Spanish-speaking audience, in a variety of formats that people are more likely to see and understand.

The Anacostia River winds nearly 9 miles from Prince George's County, MD, through the eastern wards of Washington, DC, before emptying into the Potomac River. About 70% of that drainage basin is covered by homes, roads, factories, office complexes and other types of development, making the Anacostia one of the most urban rivers in the mid-Atlantic. The river was little more than a dumping ground for decades, and the continuing presence of PCBs and other toxic metals and chemicals in the sediments make it a health risk to eat many fish caught there.

Yet an estimated 17,000 people eat fish from the river each year, according to an Anacostia Watershed Society study. Many are African American or Hispanic. If anglers don't eat the fish themselves, they often share their catch with local families, the research showed.

Although warnings to avoid or limit fish consumption are typically posted and published in multiple languages, people from Latin America often remain unaware of them because such pronouncements don't exist in their native countries, said Ruby Stemmle, founder and CEO of EcoLatinos, a DC area environmental group.

"They come from places where there are no restrictions," she said. "I'm not saying the rivers aren't contaminated, but there are no restrictions."

A survey conducted in 2011 by the research firm Opinionworks found that 20% of people interviewed while fishing along the river were unaware of the health risks. But that total zoomed to 53% among those who spoke Spanish at home.

"Fish consumption advisories are out there, but they're not being heeded," said Caitlyn Johnstone, an outreach and communications specialist for the Bay Program.

The program hired a consultant for $50,000 to look into what was going wrong and how to fix it. The analysis by Opinionworks, based on dozens of interviews with anglers, found that many anglers couldn't understand the written advisories or were uninterested in trying. It also found that most messaging is too technical. Often perceived as top-down, restrictive and confusing, the warnings are dismissed or go unnoticed.

The proposed solution, though, surprised many: Celebrate fishing and stress ways to eat the fish more safely.

Eating largemouth bass caught in the Anacostia? The idea was blasphemous among some of Johnstone's Bay Program colleagues.

"We said, 'You're going to do what?'" recalled Greg Allen, toxics coordinator for the U.S. Environmental Protection Agency's Bay Program office. "Caitlyn said, 'Yeah, I'm going to show how to safely prepare a fish."

Johnstone and her team have created an outreach strategy that now includes a poster, recipe cards, cooking demonstrations and videos.

The poster has developed into a story in miniature: four panels following a fish's journey from catch to dinner table. It shows a brown-skinned man catching a fish against a backdrop of smoky factories; a sign beside him shows the fish he's keeping with a green checkmark. He is then seen handing it to a pregnant woman in front of her home. The third panel depicts her holding the cuts of meat in her kitchen while a man filets another fish. "Cut off the skin and fat before cooking," the caption advises, referring to the parts of the fish where toxics tend to accumulate. "Discard the oil after cooking."

Johnstone said she has been tinkering with the poster's messaging and imagery for a few years, often after getting feedback from the fishermen themselves.

"Even if you couldn't read the words, you could get a sense of what it was trying to say by just looking at the pictures," Johnstone said, adding that the Bay Program plans to make the poster widely available throughout the watershed in coming months.

In 2018 and 2019, Johnstone brought the message to life by hosting cooking demonstrations at the Festival del Rio Anacostia, an annual event in Bladensburg, MD, hosted by EcoLatinos and geared toward increasing engagement in the Latinx community. It was a consistent crowd-pleaser, she said.

"You can smell the fish and you can hear the sizzle in the cast iron," said Johnstone, a former sous-chef in a corporation's cafeteria. "I would just continuously cook and talk about toxic contaminants. And every time it would happen, you would get these crowds of several people deep waiting to get their little taste of fish."

This year's festival on Oct. 24 was online because of the pandemic. So, Johnstone made short videos in English and Spanish. She narrated this time; the cooking was handled by Hugo Bonilla, chef and owner of Riviera Tapas Bar in Riverdale, MD. The videos are available at vimeo.com/471107206.

Contaminants such as PCBs and mercury are rampant across the Bay's tributaries – not just the Anacostia, Johnstone said. She hopes her efforts become a model for organizations in areas where authorities have struggled to warn people of the potential dangers lurking inside the fish they catch. A guidebook will soon be available for local governments and community activists interested in spreading the word.

The graphics and other information produced under the effort aren't geographically specific to the Anacostia, the EPA's Allen said. That way, they can be used and reused around the watershed. For information, contact Johnstone at 410-267-9874 or cjohnstone@chesapeakebay.net. ■

Military enlists help to solve eagle mystery at Patuxent runway

Experts are tracking the birds with hopes of avoiding another crash

By Whitney Pipkin

A bald eagle takes off from a runway at Naval Air Station Patuxent River, with a V-22 Osprey in the background. (Mike Wilson / U.S. Navy)

Bald eagles don't need a long runway to take flight, but they appear to enjoy hanging out on one anyway.

That's the case for a convocation of as many as 50 eagles that have been gathering on the airstrips at Naval Air Station Patuxent River in Maryland on fall mornings — causing problems for the aircraft that need those runways to take off.

Conservation officials at the base have begun a months-long study of the birds to better understand why they're spending more time in the area and on some of its most mission-critical stretches of asphalt.

"We don't know where they're coming from, why they're coming or where they go when they leave," said Kyle Rambo, director of environmental planning and conservation at the base.

Crews already band and monitor the activities of resident bald eagles on five nests on or near the 7,000-acre airfield. But the group of birds that spend time on the airstrips appear to be just passing through, showing up in large numbers on cool mornings in September and October.

More information about these eagles would help the base avoid another midair — or mid-airstrip — meeting between bald eagles and the base's fleet of flyers, including V-22 Ospreys, F/A-18 Hornets and P-8 Poseidons.

In October 2019, a bald eagle caused nearly $4 million worth of damage to the engine of a large E-6 Mercury that struck the bird during takeoff. No personnel were injured, but the $141-million aircraft was grounded for weeks while it was repaired.

"We have always known that eagles have the potential to cause damage, but that was a big one," Rambo said.

This isn't the first clash between birds of prey and planes at the air station, which juts into the Chesapeake Bay at the mouth of the Patuxent River. An airplane struck an eagle there nearly 30 years ago.

But the base has seen nine additional eagle strikes in the last decade or so, Rambo said. Almost all of them have occurred in September and October.

Over that same decade, the military base began banding and studying the nesting bald eagles and their young that were born on or near the property. None of the strikes so far have involved those resident eagles, Rambo said. That leaves unanswered questions about the traveling eagles that visit their runways each fall.

The base is working with The Center for Conservation Biology, a research arm of the College of William & Mary and the Virginia Commonwealth University, to study this eagle phenomenon over the next year. The effort started with trapping and banding about 10 of the eagles in October.

Bryan Watts, director of The Center for Conservation Biology, said eagles are very sociable and often hang out in clearings near wooded areas, especially in the mornings. It's "like retired men coming to Hardy's to jaw and have breakfast," he said."

Watts, who has been conducting eagle surveys in the Bay region for nearly 30 years, said the eagles on the runways appear to be just passing through. His researchers observed some "classic migration behavior" in mid-October when a group took off from the base on some midday thermals and headed south. Watts said the gatherings on the runways are unique, though, because the mouth of the Patuxent River is not known to host high concentrations of migrating eagles. Eagles from Florida, Eastern Canada and New England are known to congregate in the upper reaches of several Bay rivers, including the James, Potomac, Rappahannock and the area between Aberdeen and the Conowingo Dam.

"We have studied all of these. All are within the lower saline reaches of the Bay and we assume all depend on [eating] spent spawning fish like herring and shad," Watts wrote in an email. The Patuxent gatherings are unusual, he noted, because they are near the mouth of river where the food sources would be pretty different.

Rambo and his team will use satellite tracking devices to follow the eagles for the next year, which will give them a better idea of why they are coming to the base — and whether they can nudge them toward a better hangout.

Managing bald eagles is a challenge for other airfields in the United States, where the birds are growing in number but still benefit from federal protections. Bald eagles are no longer endangered, but they are protected by the federal Bald Eagle Protection Act of 1940.

The population growth of eagles in some parts of the Bay watershed, especially along the James River, has exceeded expectations in recent decades. That's true near the Patuxent naval air station, too.

"I started working here in 1981, and it was a rare sight to see an eagle. Now, you can't walk outside without seeing them," Rambo said.

Once crews know more about the recent gatherings, they have several options to prevent collisions.

One option, Rambo said, is to modify features of the airfield that are appealing to the birds. Already, for example, they keep the grass around its airstrips cut to a height of 7-14 — too long to attract flocks of Canadian geese and black birds.

Crews can also actively deter the birds — think fireworks, whistlers, bangers and bird distress sounds — and got a permit to use some of those tactics on the eagles three years ago, with varying degrees of success.

Another option, especially if the eagles turn out to be at the airstrip for limited periods of time, is to modify flight plans around their presence.

New technology may help, too. The naval air station recently purchased a radar system devoted to identifying and avoiding birds in the air. Getting bird-specific radar and hiring crews to study them is expensive, Rambo said, but so are collisions.

"You could run that radar for 30 years for the cost of that one aircraft mishap," he said. ■

Aaron Henning, a fisheries biologist with the Susquehanna River Basin Commission, takes a water sample from a tributary to the Susquehanna River in New York. Scientists will analyze the water for DNA to determine the presence of invasive round goby and northern snakeheads. (Luanne Steffy)

‘eDNA’ reveals what’s swimming in the water

Sampling tool is less harmful to aquatic habitat – and less costly

By Ad Crable

A new search tool involving not much more than filling a container of water is revolutionizing how scientists detect and keep track of threatened and invasive creatures in the vast waters draining into the Chesapeake Bay.

Some have likened environmental DNA, or eDNA for short, to a kind of forensic science for wildlife conservation. It involves analyzing the unique DNA codes shed into the water by an organism’s skin, feces, blood, mucus, sperm and other biological material.

By doing so, wildlife managers and scientists can verify the existence of elusive fish, amphibians and reptiles — without an army of staff bearing nets, fishing poles, electrofishing rods or permits. It also doesn’t involve handling the creatures or disturbing sometimes sensitive habitat.

“You can scoop up water and know what’s been there,” said Louis Plough of the University of Maryland Center for Environmental Science, who has used eDNA to map where and when river herring are running in the Bay.

Just in the last several years, eDNA has provided invaluable information on some of the most troubled or harmful denizens in the region’s water bodies. For example: In Virginia, Maryland, Pennsylvania, New York and West Virginia, eDNA has been used to find the last haunts of the endangered eastern hellbender. In Virginia, new populations were discovered.

The practice is more reliable in finding the giant salamander than the traditional methods of snorkeling and flipping over rocks — and safer for the hellbenders, too. In a 2018 comparison study of 22 streams in West Virginia, eDNA methods found hellbenders three times more effectively than traditional fieldwork.

In Virginia and Maryland, scientists relied on eDNA for the first survey of migrating alewife and blueback herring in 40 years. It’s a project that would have had a high price tag and likely would not have been funded if traditional field surveys were used, said project co-coordinator Matt Ogburn of the Smithsonian Environmental Research Center.

The eDNA vastly improved on previous surveys that relied on netting fish eggs of river herring. But it was hard to tell the difference between eggs dropped by gizzard and hickory shad and it took expensive laboratory work to sort it out.

In West Virginia, eDNA is being used by Trout Unlimited to find and protect wild trout in previously unsurveyed streams in advance of disruptions from fracked natural gas pipelines, wells and roads.

In Virginia, eDNA searches found endangered and elusive wood turtles in 17 northern Virginia streams where they weren’t known to exist. And the state Department of Transportation paid for a study to develop eDNA protocols so that the agency can look for the endangered James spinymussel before approving road and bridge projects that impact streams.

The Susquehanna River Basin Commission began using eDNA in 2015 to confirm the presence of invasive didymo (a slimy algae also known as “rock snot”) in Pennsylvania. Since then, the commission has launched eDNA searches to find the invasive round goby fish in the upper reaches of the Susquehanna River in New York and invasive snakeheads and blue catfish in the lower Susquehanna in Pennsylvania and Maryland.

Brianna Hutchison, an aquatic biologist with the Susquehanna River Basin Commission, filters a water sample taken near the Susquehanna River in Lancaster County, PA. A lab later analyzed the sample for DNA that could indicate the presence or absence of invasive quagga mussels in the quarry. (Ellyn Campbell)

If eDNA finds the invasives present, crews would follow up with electroshocking to try to catch and kill the invaders. That's just what happened this summer when a handful of snakeheads passed through the fish lifts at the Conowingo Dam and made it up the Susquehanna.

This fall, the commission is sampling 40 Bay tributaries, including the Upper Susquehanna, to look for snakeheads and the round goby. It's an extensive survey that would have required months and many people if it were conducted by a traditional field survey.

Genetic sleuthing

All organisms continually shed cells containing their DNA, chemical building blocks that carry a creature's biological instructions. Humans, for example, shed 30,000–40,000 skin cells every hour.

Every species has a unique DNA sequence. More than a decade ago, scientists started filtering left-behind material floating in the water. Then, in a lab, the unique genetic markers, called barcodes, are found in the goo and used to determine the presence of various wildlife.

Some of the first work done on eDNA was in 2008 when the process was used to target invasive American bullfrogs in French wetlands. Another early study determined if it was humans, cows, pigs or sheep contaminating water sources in Canada.

Since then, scientists have begun mapping out DNA barcodes for the world's creatures, from nemotodes to elephants.

At the Smithsonian Environmental Research Center, Ogburn, along with biologist Rob Aguilar and others have been working since 2012 on a Chesapeake Bay Barcode Initiative to create and share a data base so that scientists can use eDNA to identify all organisms in the Bay watershed to a species level, from tiny crustaceans to sharks. So far, they have collected 80% of the 300 fish species swimming in the Bay and 50% of 1,000 or so macroinvertebrates.

Saving time & money

In vast expanses of water, like the Chesapeake Bay, eDNA offers a quick, easy and relatively inexpensive grab sample of what's swimming around.

Ever-improving eDNA search methods have been particularly useful in the early detection of invasive species in the Bay watershed such as snakeheads, blue and flathead catfish, round goby and didymo. The more quickly that water quality and wildlife managers find them, the sooner they can swing into action.

Also, eDNA can help determine if eradication efforts of an invasive species have been successful, or if wild trout have moved into a restored stream.

Researchers lift rocks to try to find rare hellbenders. Such labor-intensive field work is being replaced in some cases by the analysis of environmental DNA, based on water sampling and lab work. The eDNA analysis also avoids handling fish and amphibians and doesn't disturb habitat. (Courtesy of Northeast Association of Fish and Wildlife Agencies)

Scooping water samples and lab work to analyze DNA make it far easier to find declining or endangered species in inaccessible waterways. The sometimes delicate creatures don't even have to be captured or handled. New devices that can be left in the water to gather timed samples are coming on strong, further reducing the human resources needed for collecting eDNA.

"Especially with cryptic creatures that are hard to find, it can focus your efforts," observed John Kleopfer, Virginia's state herpetologist. "It's definitely another tool in the toolbox for us."

A look into the effectiveness of eDNA by the U.S. Geological Survey concludes, "For small, rare, secretive and other species difficult to detect, eDNA provides an attractive alternative for aquatic inventory and monitoring programs. Increasing evidence demonstrates improved species detection and catch-per-unit compared with electrofishing, snorkeling and other current field methods."

The simple and cheaper eDNA method can stretch grant money. "There are cost savings from having one person go out and take grab samples that will take an hour instead of four people in the field spending a full day electrofishing," said Ellyn Campbell of the Susquehanna River Basin Commission. "There is so much more value and bang for the buck."

Determining species through lab analysis, with a quick turnaround, can cost $80–$100 per sample. "It seems expensive until you factor in how much it costs to have a 10-person crew lift rocks and find nothing. That gets expensive," said Eric Chapman, a field scientist with the Western Pennsylvania Conservancy who has used eDNA to find elusive hellbenders. Next year, the conservancy hopes to partner with a local high school to do the eDNA lab work.

Ogburn considers eDNA lab analysis a bargain in his river herring research. An eDNA sample can be filtered and processed in 15 minutes, compared to paying several people to travel to a site, launch a boat and try to gather fish eggs and larvae. Then it takes roughly an hour to sort through each sample under a microscope.

Limitations

Environmental DNA may be reimagining the frontier of conservation sleuthing, but scientists say it will never completely replace old-fashioned ways in the field.

For one thing, eDNA has limitations.

"It will tell you if you have animals present, but not the sex ratio, whether reproduction is going on and age classes. It does tell you animals are in that stream but not when and how far upstream," Kleopfer said. "It won't replace field studies."

Agreed Aaron Henning, a fisheries biologist with the SRBC, "It will never replace electrofishing. Nothing compares to having your hands on a sample."

Chapman has used eDNA extensively to find hellbenders. But hands-on work is still necessary to find out crucial information such as age and health, he said. The attitude of many field biologists, he said, remains "If we don't touch it, we don't believe it."

In certain conditions, like excessive sunlight, high water temperatures or chemicals in the water, eDNA floating in the water will degrade fairly rapidly, reducing its effectiveness and making it difficult to distinguish between closely related species, noted Walter Smith, an associate professor of biology at the University of Virginia's College at Wise.

High water may transport the evidence of species far downstream from where they actually are. Barcodes for some species have been wrong, confusing results.

Still, eDNA has quickly become a heavy hitter in the toolbox of finding out who swims where throughout the Chesapeake Bay.

"It won't solve all data needs but it allows us to do a lot of things that weren't possible before," Ogburn said. ■

The tidal portion of the Rappahannock River flows by Fones Cliffs in Virginia on its way to the Chesapeake Bay. (Dave Harp)

Scenic designation would help protect lower Rappahannock

Advocates hope to see vote in state legislature by next spring

By Jeremy Cox

An incomplete list of the adjectives used to describe the tidal portion of Virginia's Rappahannock River over the years: free-flowing, fun, largely undeveloped, valuable, pristine, historic, important, renowned, forested, frequently murky, fertile, popular, brackish, rich, abundant, diverse.

But is it scenic?

Yes, that word has been bandied about aplenty, too. But now some of the river's biggest advocates want to make it official.

A growing coalition of local governments and environmental organizations is pushing Virginia to designate the lower 80 miles of the Rappahannock as a scenic river. By the end of October, eight of the nine counties adjacent to the river had signed onto the campaign as well as three cities, the Rappahannock River Basin Commission and more than two dozen conservation groups.

The designation wouldn't impose any new land use controls or regulations, restrict boating or grant public access to private properties along the river. Rather, supporters say, it would help promote ecotourism, amplify local voices in state and federal projects that affect the river and require state agencies to consider natural and recreational impacts when making permitting decisions.

Fringed by the metro areas of Washington, DC, to the north and Richmond to the south, the Rappahannock region is among the fastest-growing areas of the state. A scenic river designation would help the waterway retain as much of its natural character as possible, advocates say.

"It's not saying, 'You can't build on the river,'" said Anne Self, the lower river steward for the Friends of the Rappahannock. "It's just saying, 'Let's consider the preservation and protection as we go about this.'"

Supporters point to the 50th anniversary of the Virginia Scenic Rivers Act in 2020 as another motivation for the push. Since the law's passage, the state has designated 37 river segments as scenic for a total of about 1,000 miles of waterways, or about 2% of all river miles in the state. The upper Rappahannock was named a scenic river in 1985, an 86-mile stretch from its headwaters near Chester Gap to just below downtown Fredericksburg.

From that point, the Rappahannock grows gradually saltier and wider before emptying into the Chesapeake Bay. The river separates Virginia's Northern Neck from the Middle Peninsula. With the removal of the Embry Dam in 2004, it became the longest free-flowing river in the eastern United States.

Its waters teem with blue crabs and oysters, and it is a critical spawning ground for striped bass, river herring, American shad and sturgeon. The National Audubon Society has designated the reach between Tappahanock and Port Royal as an "important bird area," citing the presence of prothonotary warblers, rusty blackbirds and the densest breeding population of bald eagles in the state, among other species. The tidal Rappahannock is home to the Virginia's only known breeding population of Coastal Plain swamp sparrows.

Much of its shoreline remains free of urban encroachment, revealing a tableau of forested wetlands, tidal marshes and cropland. Some of the most pristine areas have been protected with the creation in 1996 of the Rappahannock River Valley National Wildlife Refuge, a collection of unconnected waterfront tracts that the Friends of the Rappahannock has likened to a "necklace of charms."

"The ecology of this area is really remarkable," said Hill Wellford, vice president of the Essex County Conservation Alliance, one of groups leading the effort.

If the lower Rappahannock gets recognized as scenic, it would become the first river in the state to carry that designation along its entire run, Self said.

"It's one of the few rivers left in Virginia that doesn't have a lot of development along its shoreline," she added.

The support from the local jurisdictions triggered the second phase in the scenic river process: an analysis by the state Department of Conservation and Recreation to determine whether the Rappahannock meets the program's criteria. Among the factors: the width of the natural areas along the river, the density of development in rural spots, the quality of its fisheries, the number of road crossings and the amount of recreational access.

A river can have evidence of human disturbance, sometimes quite visibly, and still qualify as scenic, said Lynn Crump, who oversees the program for the DCR. The James River in Richmond and the upper Rappahannock's high concentration of farm fields both won inclusion in the program, she noted.

"It doesn't have to be absolutely pristine, but the idea is to have it natural in a way that whatever development there is, is not detracting from the scenic qualities, both visual and ecological," Crump said.

The "scenic" label may be a marketing tool, but it does have regulatory teeth in one key aspect: If an entity proposes a dam along the river, it must be approved by the General Assembly.

Localities can choose to assemble an advisory board to lend a say in decisions that impact the river's scenic status. The designation triggers an extra layer of review by the Federal Energy Regulatory Commission when it considers whether to license or relicense gas pipelines and electric transmission lines across the water body. And lands along the corridor can gain access to new grant funds.

If the DCR survey finds the river eligible for scenic designation, the localities must endorse it for the measure to move to the final stage: passage in the General Assembly. If there are any holdouts along a reach — Middlesex County's Board of Supervisors tabled the idea in September, pending further legal review — other segments can still go forward, Crump said.

Supporters hope to bring a Rappahannock scenic-designation bill to state lawmakers. ■

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

ICON: Saw-whet Owl (Dave Darney / U.S. Fish and Wildlife)

A: Juvenile northern saw-whet owls look totally different from their elders. The young birds develop adult plumage when they are about a year old. (Sam May / CC BY 2.0)

B: The fluffiness of this saw-whet owl's feathers reveals that it feels relaxed. When the bird feels threatened, it lengthens its body and wraps a wing around its front, hiding its legs and feet. This helps the owl blend in among the branches of its perch. (Bri Rudinsky / U.S. Fish and Wildlife Service)

Owl you need to know

Hoot's Who Here: There are 19 owl species in North America. Four of these — barn, barred, eastern screech and great horned owls — are common and breed in the Chesapeake Bay watershed. Three others breed in the region: saw-whet (less common) and the short-eared and long-eared (rare). Snowy owls, which show up in the Bay region almost every year, are classified as "visitors." A burrowing owl showed up unexpectedly in Maryland in 2020, but that species is not a regular visitor and the guest appearance was classified as "accidental."

Eye bet you didn't know this: An owl's eyes are eye tubes, not eyeballs and can't move on their own. But the bird can move its head 270 degrees (135 degrees in each direction) to help it spot its prey.

The silence before the silenced: The edges of an owl's flight feathers are serrated. This allows the air to pass through them without a sound. The owl's prey never hears it coming.

Talented toes: Want to sound as wise as an owl? Tell your friends that owls are zygodactyl, then explain that this means they have two forward-facing and two backward-facing toes on each foot. But owls go one better than other zygodactyl birds: One of their back toes can pivot forward to help them grip objects or walk.

Parliament: The term for a group of owls.

Blessing or blight? Depends on where you live. Ancient Greeks believed owls brought good fortune. Romans, on the other hand, thought they were an omen of death. In Welsh folklore, if a pregnant woman heard an owl, her child would be blessed. Folk stories from Southeast Asia held that owls would eat newborn children.

Extreme strigiformophobia: In some central-west African cultures, it is said that fear of owls is so extreme that the bird is known only as "the bird that makes you afraid."

Whet your appetite

Tiny as it is, one would never mistake the northern saw-whet owl for a songbird. Its name is derived from the *"skiew"* call it makes when it is agitated or alarmed. Those who have heard it liken it to the sound of a saw that it being whetted (sharpened). Here is a quiz about this nocturnal creature that will help shed light on it and other owls. Answers are on page 44.

1. The saw-whet is only found in North America and is one of the continent's smallest owls. How small is it?
   A. 7.1–8.3 inches, weighing an average of 2.3–5.3 oz. (about the size of house wren)
   B. 7–8.5 inches, weighing an average of 2.6 oz. (the size of a robin)
   C. 9.0–10.5 inches, weighing an average of 2.0–3.2 oz. (the size of a red-bellied woodpecker)
2. Although saw-whets are found in a variety of habitats, even occasionally in suburban areas, its preferred habitat is:
   A. Coniferous forests
   B. Open fields
   C. Freshwater marshes
3. Owls usually swallow their prey whole. Indigestible material — teeth, skulls, claws, feathers — can injure the birds' digestive tract, so the owl's gizzard compacts these materials into a tight pellet that it then regurgitates. All of the prey listed below have been found in saw-whet pellets. Which two are found most often?
   A. Bats, frogs
   B. Deer mice, voles
   C. Sparrows, chipmunks
4. Saw-whets' most common predators are hawks and larger owls. Whose pellets are saw-whet remains found in most often?
   A. Barred, great horned & long-eared owls
   B. Barn, great horned & screech owls
   C. Barn, barred & great horned owls
5. The saw-whet (and other owls) can accurately pinpoint its prey purely by sound. What allows this?
   A. One ear is higher than the other.
   B. Each ear opening is shaped differently.
   C. A & B
6. The saw-whet's territorial song isn't much more melodic than its alarm call. What does it sound like?
   A. Fingernails on a chalkboard
   B. Static on the radio
   C. Truck backing up
7. The age of a saw-whet (and a few other owls) can be determined by looking at the underside of the wings. What do biologists look for?
   A. The underwings start out pale beige and turn darker as the bird ages.
   B. The underwings add a stripe each year the bird ages.
   C. The underwings glow neon pink under an ultraviolet light. The brighter the color, the younger the bird. ■

VA hike follows path of female conservationists

By Whitney Pipkin

Photo: Kiersten Fiore, visitor services and operations manager for the Ellanor C. Lawrence Park in Fairfax County, VA, leads a guided hike that helps tell stories of women conservationists. (Whitney Pipkin)

The year 2020 marks a century since women were granted the right to vote under the 19th Amendment, but the roots of female-fueled conservation run much deeper than that date.

Many of the protected landscapes surrounding the Chesapeake Bay owe their preservation to women — who "voted" with letters, articles and deeds of trust both before and after they could do so at the ballot box.

That inspired Kiersten Fiore, visitor services and operations manager for Ellanor C. Lawrence Park in Fairfax County, VA, to retrace the steps of a few of these "women of the wild." Her guided hike through the park, available on request for groups and individuals, uses trail landmarks to tell the story of a handful of women who have worked locally, regionally and nationally to steward the environment for future generations.

"A lot of women helped preserve and save these lands, houses, forests and meadows," Fiore said.

Ellanor C. Lawrence, for whom the park is named, had money of her own before she married the wealthy co-owner of the *U.S. News & World Report*, David Lawrence. She purchased the 650-acre property that is now the park in 1935 and, upon her death in 1969, Lawrence willed the property to her husband on one condition: that he would gift the land to a public agency.

He did so in 1971 — including a backup clause to guarantee that, should the county try to develop the land, ownership would shift to a local church.

Today, the park provides access to sprawling meadows, trail-filled forests, a pond with turtles and beavers and two sizable streams. A converted 1780s farmhouse, which served a tobacco-growing family before the Civil War and a dairy-farming family after, now functions as a visitor center.

"Ellanor gave us this park to preserve," Fiore said, setting off from the visitor center on a wooded trail. "But starting back in earlier history you have women who were doing that, too, striking a movement to save land and resources but also to protect people."

Near the middle of the park's forest, a vigorous Walney Creek trickles beside a footbridge while countless birds rustle and chirp in the trees. It's a fitting spot to bring up biologist Rachel Carson, whose 1962 book, *Silent Spring,* raised the alarm about songbirds silenced by unrestrained pesticide use. Her work helped launch the modern environmental movement.

Born in 1907, Carson came of age at a time of chemical proliferation. During World War II, pesticides such as DDT were sprayed from airplanes to keep insects under control and prevent the spread of disease. Fiore said granules of DDT were even tossed into the air at weddings.

Research was revealing grave impacts to insects and birds exposed to DDT, so Carson proposed an article on the subject to *Reader's Digest* in 1945. The magazine told her such a piece would be too "unpleasant," but Carson continued to study and write about the issue.

In 1958, a woman invited Carson to her home in Massachusetts where the spraying of DDT to quell mosquito populations had killed songbirds.

"Rachel went up and realized it would be one of the most silent springs she would experience," Fiore said, standing at the footbridge.

A decade after Carson's book was published, DDT was banned. The interim years saw the passage of the Clean Air Act and Wilderness Act. Carson died of breast cancer in 1964, before endangered species earned federal protections and before the 1970s ushered new environmental protections, many of which can be traced to Carson's work.

Though unmarried, Carson juggled the care of three children in her extended family, one of whom she adopted, while writing books in the 1950s. Still, Fiore said, Carson fielded jabs from chemical companies that labeled her a "spinster" who had little at stake in conversations about the impact of chemicals on future generations.

But her 1956 article, *Sense of Wonder*, later turned into a book, emphasized the importance of allowing children to be curious about

nature, something Fiore said the park authority encourages daily today.

The creek running below Fiore's feet as she talks about Carson is one of the touchstones for such conversations with children at the park. Walney Creek originates on the grounds, trickling out of a stone structure near the farmhouse where it helped to keep milk and other goods cold for the dairy-farming family. Because it is contained entirely on protected, largely undeveloped property, the creek remains a source of discovery — and interesting animals.

Stopping along a densely wooded portion of the trail, Fiore said that many women got their start in conservation by bird watching or simply walking through nature, then finding an obstacle to its continued enjoyment.

Rosalie Edge was one. She was born to a wealthy family in 1877 and married a cousin of Charles Dickens. Dividing her time between England and New York, Edge was inspired by the suffragette movement in London and ready to find her own cause.

"The women who had power and money were educated, but to marry well," Fiore said. Still, "you have your own ideas, so what are you going to use them for?"

A 1929 pamphlet from the National Museum of Natural History in New York City provided the spark for Edge. It alleged mismanagement at the top levels of the Audubon Society, which the museum claimed was subverting its conservation goals by indiscriminately renting land to hunters. Edge took the organization to task, deploying her influence as a "society lady," according to Dyana Furmansky, who wrote the biography, *Rosalie Edge: Hawk of Mercy*.

"During her decades of dominance, Edge was considered the greatest woman conservationist, nature's most effective protector since John Muir," Furmansky wrote.

In 1932, Edge saw photographs of piles of dead raptors, killed by hunters both for sport and to protect their barnyard fowl in Pennsylvania. "Man hates any creature that kills and eats what he wishes to kill and eat," Edge wrote in response. "He does not take into account the millions of rodents and insect pests that hawks consume."

Edge went to create her own nonprofit, the Emergency Conservation Committee, to help protect land that was key to bird migration but did not find support, Fiore said. She then raised the money herself to eventually buy a section of a mountain in Pennsylvania in 1935 and permanently protect it as Hawk Mountain Sanctuary.

Edge also played an important role in creating Olympic National Park and Kings Canyon National Park and in adding acres of old-growth sugar pines to Yosemite National Park.

Women have played key roles not only in preserving lands but also in managing them well. That's the case at Ellanor C. Lawrence Park, Fiore said, as she reached an overlook with views of a golden meadow below, mostly hidden from the road by trees.

Here, prescribed burning has become a linchpin of the park's efforts to return the land to its former health. Kristen Sinclair, an ecologist with Fairfax County, helps to manage the prescribed burning program, which uses fire to help regenerate soils and plant species on 100 acres of county land.

Sinclair benefits from women trailblazers in her field, like Bequi Livingston, whom Fiore also featured on the hike. Livingston, who started working for the U.S. Forest Service in New Mexico in 1979, was the first woman to serve on the Sandia Mountains firefighting crew and one of the first two women to fight wildfires on the Smokey Bear Hotshot Crew. She now runs the Women in Wildland Fire Boot Camp to help women gain the knowledge and physical fitness needed to serve as backcountry firefighters or conduct prescribed burns.

Fiore said she finds women working in these smaller corners of the conservation movement just as inspiring as the household names.

"The Rachel Carsons and Rosalie Edges, they had the power to be visible, but most of the people who are fighting do not," Fiore said. "They're affecting change in their communities, in their neighborhoods and in their parks." ■

IF YOU GO

Ellanor C. Lawrence Park is located at 5040 Walney Road in Chantilly in Northern Virginia. Its 650-acre grounds include forests, streams, meadows and a pond. The visitor center is closed due to COVID-19 restrictions, but the park's trails are open dawn to dusk. Various outdoor nature programs are available for youths and adults.

ADMISSION

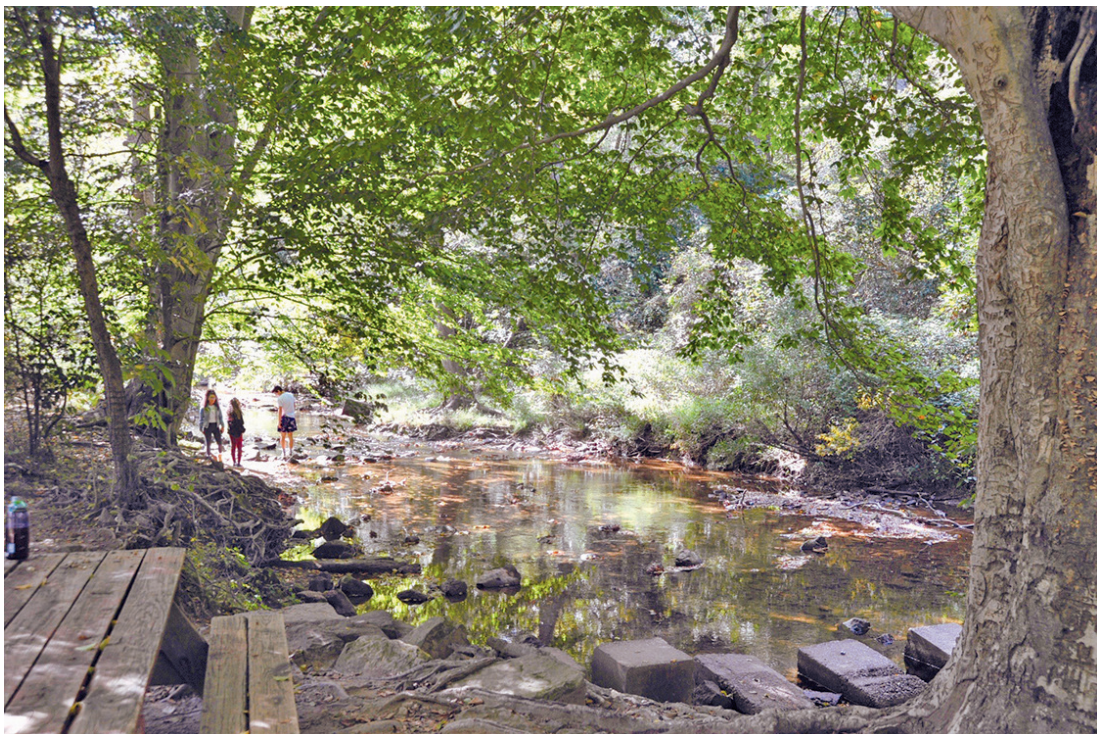
Admission is free, with small fees for scheduled programs and guided hikes.

FOR INFORMATION

Call 703-631-0013 or visit fairfaxcounty.gov/parks/eclawrence.

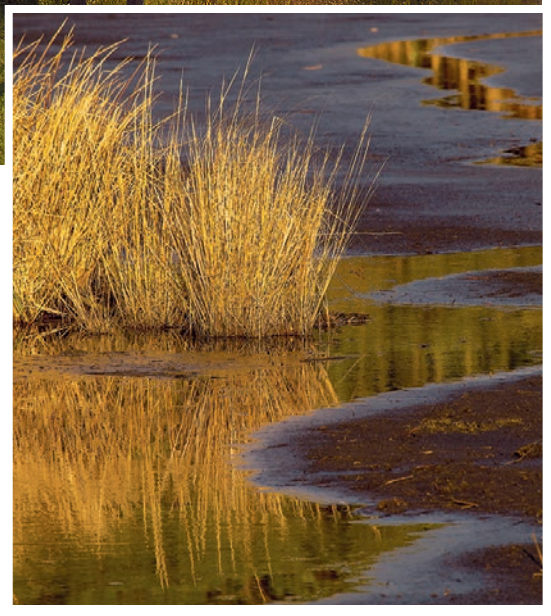
WOMEN OF THE WILD HIKE

You can schedule this guided hike, an easy woodland walk of less than 2 miles, for an individual or a group by emailing Kiersten.Fiore@fairfaxcounty.gov or calling 703-631-0013.



Top photo: A guided hike at the Ellanor C. Lawrence Park in Northern Virginia includes stops along the trail where visitors learn about women in conservation, past and present. (Whitney Pipkin)

Bottom photo: The Ellanor C. Lawrence Park provides access to sprawling meadows, trail-filled forests, a pond with turtles and beavers, and two sizable streams. (Whitney Pipkin)



Take a ride on the wild side: Explore Blackwater by bicycle

By Kate Livie

The road at Blackwater National Wildlife Refuge on Maryland's Eastern Shore curves through the marshes like a dark ribbon. Beyond painted turtles making their way from one wet shoulder to another, there's little traffic in this semi-submerged landscape. Overtaken by tides twice a day, and more often when the wind blows from the right direction, Blackwater is the domain of species that thrive in the soft margins of the water's edge — egrets, muskrat and osprey.

Most people navigate the tangle of creeks and ponds by boat. On the day I visited, there were people in several jon boats and fishing kayaks angling for snakeheads. But there's another, unexpected way to see the breath-stealing beauty of Blackwater. For an unforgettable ride through the Chesapeake's beating heart, explore the refuge by bicycle. With your two wheels threading a quiet road, you're wide open to a wild landscape shaped by wind and water.

Until recently, my relationship with Blackwater has been only surface-deep. I've briefly visited the Harriet Tubman Underground Railroad National Historical Park in the north part of the refuge, and crisscrossed Blackwater's interior driving to and from a Hooper's Island oyster farm, but I'd never really immersed myself. It's an oversight I intended to address with my latest passion — cycling.

The advent of the coronavirus lockdown was also the beginning of my serious interest in bicycles. From my home base in rural Kent County, MD, it made adjusting to social distancing pretty easy. There, the shoulders are spacious, fields are vast, and I was left to pedal across the miles and through the seasons in an environment largely unchanged by the chaos in our human world.

I soon recruited my husband, Ben, to my new bike posse in search of longer rides with more landscapes to explore. We set our sights on Blackwater National Wildlife Refuge: Within its 28,000 acres lies two paved bike loops of 20 and 25 miles on flat, lightly trafficked roads. Shorter routes are available, too.

Annually, about 200,000 people visit Blackwater. An estimated 1,600 of those visitors are cyclists. It's puzzling, because the refuge has so much going for it from a cyclist's perspective. Along with having well-marked bike routes, it's remarkably beautiful. It's also an easy day trip from Baltimore and Washington, DC, with Cambridge nearby to satisfy all of your creature comforts (lodging, wood-fired pizza, stellar craft beer). Those comforts also provide excellent incentive the next morning to pedal off your sins from the night before.

Perhaps it's better this way. Cyclists have uncrowded access to arguably one of the most intense Chesapeake experiences the region has to offer. From vast salt meadows and hidden ponds to wooden bridges and small watermen's communities, the places you encounter while travelling Blackwater by bicycle reveal just how richly diverse this landscape is — and how quickly it is changing.

Top photo: Two cyclists explore the marshy expanse of Blackwater National Wildlife Refuge on Maryland's Eastern Shore. (Dave Harp)

Bottom photo: Water ebbs and flows from a mudflat at Blackwater National Wildlife Refuge. (Dave Harp)

For our Blackwater experience, we chose the ambitious 25-mile loop, which starts at the visitor center on Key Wallace Drive. Other groups of cyclists were headed for Wildlife Drive, which provides a shorter, 8-mile trip through a lovely, paved route with plenty of water views and wildlife. But we were in search of history as well as nature. Heading east toward Maple Dam Road, we cycled deep into Tubman country — the fields and marshes where Harriet Tubman was enslaved, escaped to her freedom and later returned to free so many others.

About 170 years ago, the fields and marshes along the Blackwater were plantations. Just a few miles into our ride, we approached the wooden bridge across Little Blackwater River, near the site of Atthow Pattison's tobacco farm. Here, Harriet Tubman's grandmother, Modesty, was enslaved and Harriet's mother, Rit, was born.

This creek was where Harriet began to build her deep knowledge of Blackwater's land and waterways. As a small child, Harriet was hired out here in winter to watch muskrat traps for James Cook and his family. Later, working on the local docks and timbering in the forests of lower Dorchester County, she honed her keen relationship with this landscape — expertise that would later be vital to her own survival and the survival of the others she led north.

Cycling through the farmlands of Harriet's youth that still dominate this corner of Blackwater, it seems that time is as thin as onionskin and just as layered. But the sense of untouched timelessness is a mirage. Though development has not transformed this landscape, it is nonetheless in transition. Since Blackwater was established in the 1930s as a refuge for migratory waterfowl, more than 5,000 acres of marshland have been claimed by the rising waters of the Chesapeake Bay. Forests have become wetlands, and wetlands have become submerged in the rising water. By the end of the century, scientists suggest that almost all of the marsh in the refuge will be drowned by 3 feet or more of rising sea levels.

As we turned from Key Wallace Drive to Maple Dam Road, those signs of change are unmistakable. Hardwood stands of oak and holly give way to loblolly pines and marsh grasses. Saltwater from advancing tides have killed many of the pines here, their wood gray and weathered: "ghost forests," they are called.

Riding deep into the spartina and salt meadows, the signs of this progression are hard to ignore — mostly because you're biking right through it. The skinny two-lane road that crosses the center of Blackwater's marshes gets unmistakably slimmer twice a day when the tides rise. Puddles take over the pavement, and pushing through them means a crest of water thrown up your back in a "rooster tail." After a few miles of this (word to the wise, check the tide charts), my rooster tail has joined up with my wet feet and wet legs.

It's a small price to pay for the glory I'm witnessing, though. Like a huge bowl, the sky extends in all directions, broken only by low-lying tumps of loblollies. Egrets, blown by the wind like great white kites, tumble and pitch over the swelling marsh grasses. The dark water, reflecting the sky, is a searing blue. "This is amazing!" I called ahead to my husband, in general if inadequate appreciation.

But it's fragile, this wild loveliness. As marshes are overtaken and transform into open water, the thriving ecosystem within Blackwater is also threatened. Tidal marshes represent some of the Chesapeake's most precious real estate, supporting immense biodiversity and acting as nurseries for many juvenile species. Their loss erodes the foundation of the Bay's enormous food chain, undercutting the populations of its most important and sought after resources.

Drying out a bit, we approach another wooden bridge over Cole's Creek to Shorter's boat ramp. In the final push of our trip to Lakesville-Crapo Road and back to Key Wallace Drive, the ripple effects from Blackwater's transformation are everywhere. Empty houses, empty churches and empty schoolhouses sit in water up to their foundations. As the Bay consumes this low-lying place, many communities that made their living from its resources have dried up or been displaced. From our two-wheeled perspective, I see more than one boat tied up in a dry yard as a precautionary measure. The message is clear: the tide is coming. And who knows if this time it will fall again?

You don't need to travel to Venice to see a spectacular place threatened by water. Blackwater National Wildlife Refuge is here to experience now. Whether in winter, when waterfowl densely pack the ponds, during the spring chorus of frogs, or on a crisp fall day, there is no bad time to visit, unless you wait too long. Throw a bike on your carrier and head to Dorchester County to witness its otherworldly, fleeting beauty for yourself. Snap a few photos so in 50 years you can say, "I saw it before it was gone. And it was so incredible."

Top photo: Water spills onto a road at Blackwater National Wildlife Refuge during high tide. (Kate Livie)

Bottom photo: A "ghost forest" of gray-white trees, killed as the land was flooded with higher water, is among the signs of change at Blackwater National Wildlife Refuge. Dave Harp)

BLACKWATER NATIONAL WILDLIFE REFUGE

For information, including bike maps, visit fws.gov/refuge/blackwater.

HARRIET TUBMAN

Some of the sites mentioned in this article are mapped in the Harriet Tubman Underground Railroad Byway. For information, or to add a few stops to your route, visit https://harriettubmanbyway.org/byway-sites.

BEFORE YOU GO

Be sure to check for any closures or restrictions related to COVID-19 and recreate safely and responsibly.

A kayaker enjoys a foggy sunrise on the Choptank River on Maryland's Eastern Shore. (Dave Harp)

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Tree swallows roost on phragmites in a Choptank River marsh during their annual fall migration. (Dave Harp)

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Believe it! There's drive and talent in minority students

By Imani Black

"One of the most amazing things that can happen is finding someone who sees everything you are and won't let you be anything less. They see endless possibilities, and through their eyes, you start to see yourself the same way, as someone who matters, as someone who can make a difference in this world."

— Susane Colasanti

As a native of Maryland's Eastern Shore, my rural upbringing drives my enthusiasm for conservation, restoration and stewardship of the Chesapeake Bay.

From a young age, I understood our responsibility to protect our coastal communities and knew I wanted to be a part of the solution. But, over time, even my strong passion would be challenged by the racial stereotypes and microaggressions that I felt while pursuing an environmental career.

There was one moment, though, that changed my life forever.

Recently, I saw a study published in Educational Researcher that put that moment in context. The study analyzed 5,600 Black, Latinx and white students who switched from a STEM (science, technology, engineering and math) major before earning a degree. According to the study, data showed that more than two-thirds of those students were Black or Latina/o.

Some may think those students lost interest or determined that they lacked the academic ability to compete in a STEM major.

But as an African American woman with both a degree and career in STEM, I don't automatically assume these were indecisive students. Instead I think, "Wow! That's 4,321 ideas, conservation efforts, environmental advocates, innovations, researchers and multimillion-dollar businesses that could have changed the current status of our planet. That's 4,321 minority students who gave up on pursuing STEM to contribute to another competitive field. How could that have happened?"

As I reflect on that, I can't help but think of my own education and how close I came to being another minority to fall into that statistic. In 2015, I was taking summer classes to help relieve my academic schedule for the upcoming college semesters.

Imani Black, founder of a new nonprofit organization called Minorities in Aquaculture, works in the Chesapeake Bay shellfish industry. (Caroline J. Phillips)

I struggled with anxiety while balancing academics, the student-athlete lifestyle and my personal battle of diagnosed but mismanaged ADD. Despite these challenges, I was both managing my coursework and being a good athlete.

One day before a chemistry lab, my coaches and athletic academic staff had a meeting with me about my major. To be honest, this wasn't the first time. According to them, they had seen me struggling long enough and came to the conclusion, based on my personality, that communications was a more suitable major for me. Then they handed me a list of communications jobs on which 'Movie Theater Manager' appeared first.

As my anger prevented me from reading the rest of the list, I sat in that chair, eyes swelling with disbelief and brokenness. People who were supposed to support me in all of my athletic and academic aspirations, people whom my parents and I trusted enough to commit to that institution, thought that even with a degree from their university my options were confined to this limited list before me. They thought so little of me and my abilities that they wanted me to make a decision that would impact the rest of my life based on their own abandoned hope for me. They were telling me I should abandon pursuing the career of my dreams.

I left that meeting unraveled by the unworthiness that started to consume me. I called my mom, scared at the thought of how upset she would be when I told her what happened. But she was calm. She encouraged me to do what made me happy despite their opinions and to pursue my passion. Even though I felt defeated, I pushed through. It would take me years to heal, unlearn and unhear the words of that meeting. That moment of motherly encouragement would fuel not only my marine biology degree, but it would be the catalyst for all the things I love and create today.

It would not only take the motivation from family and friends but pivotal mentors within my career who would enable me to not only see but believe in my own potential in my science field.

And that makes me wonder, how many other minorities have faced similar challenges? How many of those 4,321 minority students were unsupported in their time in STEM? How many of them were told that they weren't worthy or smart enough to be in these spaces? And what would our science fields look like today if everyone, regardless of race, had persevered?

So, I encourage you to believe in all people around you: your employees, coworkers, friends and anyone who may come to you with a vision for their life. Help people see the abilities and gifts that they may not see in themselves. Speak hope into their work, ideas and innovations because you never know what your words could help create. ■

Imani Black has been working in the shellfish aquaculture industry in Maryland and Virginia for the last five years. She recently launched Minorities in Aquaculture (mianpo.org), a nonprofit organization that aims to educate minority women about the restorative and sustainability benefits of local and global aquaculture, while also promoting a more diverse, inclusive aquaculture industry.

Farmers, Chesapeake profit from tech tool

By Zach Rose, Greg Rose & Tim Hushon

Wheat is harvested at Clear Meadow Farm in White Hall, MD, which participated in a stewardship project using the Truterra™ Insights Engine. (Tim Hushon / The Mill)

In our community on the banks of the Susquehanna River, doing our part to protect the Chesapeake Bay is ingrained in our way of life. We rely on the Chesapeake for so many things, from fishing, crabbing and oystering to jobs, recreation and natural beauty. The Bay is a national treasure that we call home. We all have a role in protecting it.

As local farmers and a representative of a local agricultural business, we rely on all of the natural resources the Chesapeake region provides to keep our livelihoods operating from year to year. Living and working in this vital watershed for generations, we focus a lot of attention on how each farming practice impacts soil and water health and what changes we can make on our land to improve the environment.

The health of the Bay has been significantly improving over time, but we know there is still more work to be done and we are committed to doing our part.

This is why we jumped at the chance to partner with Truterra, the sustainability business of Land O'Lakes and Campbell Soup Co., when they approached us about a project that uses an ag tech tool, the Truterra™ Insights Engine, to help farmers do even more to protect the health of the Bay. The Insights Engine is an interactive tool that allows farmers to measure and track the environmental impact of their fields and to "plug and play" different combinations of stewardship practices to identify options that maximize their return-on-investment while protecting soil and water resources. The Environmental Defense Fund was also part of building the original project structure.

We are now two years into the project and have some exciting results to share.

First off, the 10,000 acres of farmland in the Chesapeake region participating in the project showed near-zero net on-farm greenhouse gas emissions. For some acres, net emissions were negative, primarily driven by the greater adoption of cover crops (a crop grown for the protection and enrichment of the soil) and conservation tillage — a testament to the potential of farming practices to mitigate the impacts of climate change.

Nitrogen-use efficiency also improved between 2018 and 2019, which indicates that farmers participating in the project are optimizing crop yields while minimizing environmental risk. Using crop nutrients more efficiently can save farmers money and mitigate the risk of nutrient loss into the environment, a critical challenge in our region.

Another key insight was that sheet and rill erosion, which create movement in the topsoil, declined from one year to the next. This is a sign of strong soil health, which can be driven by practices we saw used on farms in the project. These included diverse crop rotations and an increase in acres using no-till management, which dramatically reduces soil disturbance.

As a farmer and ag retailer, having precise data like this about how each field is doing from both an environmental and economic perspective is new and exciting. Not only have the project and the Truterra platform given us a lot of new information that has helped "de-risk" adopting different conservation practices, they have also given us a platform to demonstrate the work we are doing to be good stewards of our land and our shared watershed, with the data to back it up. Campbell can also use this data to support their sustainability claims about their product sourcing, and we as farmers and ag retailers can use this data to attract more customers from food companies that want to meet the growing consumer demand for sustainably grown food.

Farming is in our family DNA and having young children makes it even more important to us to be good stewards of our land for future generations. We view protecting the Bay not only as a responsibility, but as a critical mission, a purpose.

Ultimately, this project and approaches like it will help us continue to expand the on-farm conservation efforts that are so personal to us here in the Bay region, while also making sure we are building stronger and more resilient farm businesses and leaving behind a healthy watershed that we can someday pass along to our children and, someday, their children. ■

Chesapeake Bay area farmers Zach and Greg Rose operate Clear Meadow Farm in White Hall, MD. Agricultural retailer Tim Hushon is with The Mill, based in Bel Air, MD.

LETTER TO THE EDITOR

Fuel companies should pay for their actions, not taxpayers

A recent article, *Norfolk races to protect vulnerable neighborhoods from floods* (October 2020), detailed Norfolk's struggle to build a protective flood wall within their timeline and budget. This flood wall is an adaptation in response to rising sea levels, which are a direct result of climate change.

Sea level rise is Virginia's greatest threat now and in the coming years. It affects the entire coastline and disproportionately affects the already marginalized and vulnerable communities that have been forced into low-lying areas. Adaptation and mitigation measures are possible, but they are very expensive.

Most importantly, the biggest oil and gas companies knew that their dirty energy was causing climate change, but they plowed forward with deceptive campaigns in the name of profit margins and shareholders. They should be held accountable for their actions and should pay for Virginia's mitigation measures instead of taxpayers.

According to the Center for Climate Integrity, 84% of Virginia voters agree that oil and gas companies should foot the bill for climate change adaptations. It's unfair for Virginians to pay a disproportionate amount for a problem they didn't cause.

Climate change and its effects are going to harm Virginia and other coastal communities the most. We must put up a fight for justice and make polluters pay for the damage they've done. Mitigation and adaptation are feasible, but taxpayers should not be held responsible for the bill.

Lauren Landis
Norfolk, VA

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 and may be edited for style or length. Opinion columns should be arranged in advance. Contact editor Karl Blankenship at kblankenship@bayjournal.com or 717-428-2819. You can also reach the *Bay Journal* by mail at 619 Oakwood Drive, Seven Valleys, PA 17360-9395. Please include your phone number or email address.

Fort Wool, nesting seabirds both need saving

By Terry McGovern

Virginians reading the *Bay Journal*'s recent article, *Bird's return to Hampton Road island defies expectations* (September 2020), celebrating recent efforts to adapt Fort Wool into habitat for nesting seabirds could be forgiven for asking, "Wait a minute, isn't Fort Wool a historic site I used to be able to visit?"

The reader would be right: Fort Wool was built after the War of 1812 as an island of granite and a companion to Fort Monroe, allowing the two forts' guns to operate together to control access to Hampton Roads.

It also served as a summer residence for two presidents, Andrew Jackson and John Tyler, as well as an initial sanctuary for enslaved Americans fleeing the Confederacy for the protection of the Union Army.

Guns from the fort fired at the ironclad CSS Virginia, in the Battle of Hampton Roads in March 1862. Abraham Lincoln observed the first Union attempt to invade Norfolk from the fort's ramparts in May 1862. The fort is listed on the National Register of Historic Places and until recently was a stop for thousands of tourists a year, who arrive on Miss Hampton II, a tour boat originating in Downtown Hampton.

Virginians traveling over the Hampton Roads Bridge-Tunnel can see Fort Wool, lying to the east, just offshore of the man-made South Island, but they may not realize the extent of the fort's surviving historic resources. Construction started in 1819 and, during the next 125 years, Fort Wool evolved as military technology advanced, resulting in a rare fort that contains military architecture spanning the entire era of the United States' seacoast defenses. Notable are remaining granite casemates dating to 1826, though most of the remaining fortifications date from the early 20th century, including the World War II Battery 229 (two, 6-inch shielded guns) and its iconic steel tower.

While fully recognizing the need for providing nesting sites for migratory seabirds and completing the bridge-tunnel expansion, these solutions need not and should not come at the expense of the permanent loss of a historic treasure.

Fort Wool not only helped Fort Monroe control access to Hampton Roads during the War of 1812, it also served as a summer retreat for Presidents Andrew Jackson and John Tyler. (Jeremy Cox)

Virginia should promptly plan a new site for the birds, as well as secure the needed funding to prepare that site and restore Fort Wool to the condition it was in before it was converted to a nesting habitat.

This means removing the huge weight of sand threatening the island's stability (a major issue for the U.S. Army engineers who built Fort Wool), building a permanent dock for public access, stabilizing the battery commander's tower and reinforcing the granite casemates (both key preservation efforts, now on hold).

These actions would allow safe visitation of the fort and ensure its survival so that future generations may learn about its role in U.S. history.

The site, in the middle of Hampton Roads, near the site of the 1862 USS Monitor-CSS Virginia battle, offers dramatic views of the Chesapeake Bay and Fort Monroe. The tourism appeal of Fort Wool is significant and can be built upon.

In recent years, thousands of visitors have disembarked from the Miss Hampton II to walk the grounds under the supervision of safety-conscious tour guides. Restoring public tours to Fort Wool can take place during the eight months each year when migratory nesting is not occurring as soon as the state Department of Conservation and Recreation stabilizes the historic structures and repairs the dock after decades of deferred maintenance.

Both the nesting birds and historic Fort Wool need to be safeguarded. We cannot trade one important resource for another. We are confident Virginia can locate an alternative seasonal nesting habitat and urge that it be done promptly.

It is vital that the citizens of Virginia let their political leaders know that preserving Fort Wool and restoring their access is important to them. ■

Terry McGovern is the mid-Atlantic regional representative for the nonprofit Coast Defense Study Group (www.cdsg.org), which focuses on the history, architecture, technology and military use of coastal defenses and promotes their preservation and interpretation. He is also a founding member of the Coalition for Historic Fort Wool.

LETTER TO THE EDITOR

Don't sacrifice landscape to fight climate change

While Sierra Club Lower Eastern Shore Group Chair Susan Olsen expresses disappointment that citizens and business owners worry about the adverse visual impacts of the 100 large industrial-scale windmills planned for placement in the Atlantic Ocean off Ocean City, MD (*Bay Journal*, September 2020), I must express my disappointment that the Sierra Club has seemingly lost its interest in protecting the natural landscapes of America. In its single-minded passion for renewable energy, it has forgotten what led its founders to create the Sierra Club in the first place.

The natural world is what drew and draws so many of us to the conservation movement. Natural landscapes across the nation are increasingly being scarred by industrial-scale solar fields and windmill farms, not to mention related overhead power lines, access roads and other appurtenances associated with these facilities.

At the risk of being scoffed at as a "climate denier," I believe the jury is still out on whether the warming we see today is predominately caused by human emissions or is principally or wholly a natural process as the Earth recovers from the Little Ice Age, which ended in 1850.

Many will passionately disagree with me on that but, in any event, we should not decimate our natural landscapes in an effort to remediate what we think is occurring. The natural beauty of America is not a small thing — treating its damage or destruction as acceptable collateral damage in the war on climate change is misguided and wrong.

Mark Perreault
Norfolk, VA

In praise of mudlarking, its treasures waiting for discovery

Josh Falk (fourth from left), then a Chesapeake Bay Foundation educator, mudlarks with a group of students and their teacher on Port Isobel Island, VA, in the early 2000s. (Dave Harp)

By Tom Horton

After three years in the literal middle of Chesapeake Bay, doing outdoor education from Smith Island for the Chesapeake Bay Foundation during the late 1980s, I decided that if forced to sum up the experience in a word, that word would be "mud."

"Hard to forget this place once you get mud 'tween your toes," the islanders would say. Muddy shoes, muddy clothes, muddy canoes; mud so thick and black and all-encompassing I could only see my students' eyeballs after one memorable wallow in the marsh.

But in our oversanitized, divorced-from-nature modern society, mud has an image problem: "his name is mud," "muddied her reputation," "dragged through the mud."

So I come to speak some words for mud and muddiness, to give a shout for ooze and slime and muck. It is a noble substance, emblematic of our great estuary's essential shallowness; the Bay's genius stemming in no small measure from its muddy bottom lying ever so close to its top.

The Bay's essential shallowness — only 20-some feet deep on average — shows itself in many ways. These are just a few:

- The rapid and efficient recycling of nutrients between the bottom and top of the shallow water column supports a biological productivity unmatched by most of the Earth's waters.
- The Bay, being so "thin," has precious little volume to dilute and absorb polluted runoff from a 64,000 mile square watershed, so wise land use is critical to water quality.
- Winds easily shove Bay waters to and fro, on many days dictating the highs and lows of tides more than the pull of moon and sun. It also means that hurricanes can cause monumental storm surges.

Which brings me back to mud — and "mudlarking," a word I have always delighted in, much underused and underappreciated. According to Bernard L. Herman, a University of North Carolina professor, the term first surfaced in journalist Henry Mayhew's 1851 book, *London Labour and the London Poor*. Mudlarks were the urchins of London, mucking along the tidal flats of the Thames for bits of coal, iron, rope, copper nails, gleaning the river's shoulders at low tide to augment a desperate existence.

But in Virginia, along the Bay's Eastern Shore and the Atlantic, mudlarking had a tastier focus — the pursuit of soft crabs and peelers (soon-to-be soft crabs). The best description of this I have seen is contained in Herman's recent book, *A South You Never Ate*, which artfully combines recipes and flavors of the lower Delmarva Peninsula with its history and folklore. In the book, Herman interviews local people on the qualities of the mud they trudged through to wrest softies and peelers from their sequestration.

"Mudpots" were places with a jellylike consistency that would suck the boots off your feet; "quiver" mud is where you'd risk getting trapped to your chest. "Mud banks" were self-explanatory — slippery slopes "you could slide down just like an otter."

"Where your tallest marsh grass is, you're going to find softer mud. Shortest grass is going to be a harder mud. You're going to find your crabs in your softer mud," declares local Billy James in the book. Some carried lard tins with them to use for support so they didn't mire down completely.

"It was a hard job," James continues, "Some people would say, 'well how do you do that?' I'd say you put your weight on the foot you're picking up. Well, that's a pretty good trick if you can do that!"

Those who mastered mudlarking might extract 500 to a few thousand crabs on a single low tide — this back in the first half of the 20th century. Peeler pots, similar to hard crab pots, took over in the 1950s as a more efficient and easy way to fish, Herman wrote.

But the term lives on in muddy Chesapeake environs like Smith and Tangier Islands, overlapping and mingling with an even richer term, "progging." Webster's definition of progging is to "forage, prowl, wander about aimlessly," but that doesn't begin to define its Chesapeake iteration.

Over the years I've been privileged to accompany a few proggers along the edges of land and water, of which the Bay has several thousand miles. We'd look for oysters, driftwood and arrowheads; for coins and bottles thrown from British warships centuries before; for broken Colonial china; for the tracks of otter, muskrat and fox; for black duck nests or baby terrapins crawling from their nests; for pieces of bone.

"Prog," pronounced with a long "o," as in "probe," (not the dictionary's recommended short "a," as in "Prague") is also used figuratively — not necessarily involving mud — by speakers of Chesapeakese. "I wouldn't crave the world if I could prog around in them electronics," a Smith Islander said to me back in the 1980s as she eyed my "newfangled" IBM PC.

There's more to progging, to mudlarking than I can easily describe. Perhaps the French noun, *flaneur*, comes closest: a wanderer about the city, sauntering, strolling, keenly observant of everything from architecture to litter to social mores. It is a state of mind, a way of being webbed wonderfully into one's surroundings, not hurrying past them as we harried moderns are prone to do.

In sum, dear reader, I hope I have muddied your understanding of the Bay. ■

Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books.

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.

Chesapeake Network
Join the Alliance for the Chesapeake Bay's Chesapeake Network to learn about events or opportunities that protect or restore the Bay, including webinars, job postings and networking. Info: put "Chesapeake Network" in search engine.

VIRGINIA

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

Cleanup support & supplies
The Prince William Soil & Water Conservation District in Manassas, VA, gives stream cleanup events the supplies and support they need for trash removal projects. Groups also receive an Adopt-A-Stream sign recognizing their efforts. For info / to adopt a stream / get a proposed site: waterquality@pwswcd.org. Register events: trashnetwork.fergusonfoundation.org.

Tree planting sites needed
Goose Creek Association has partnered with Friends of the Rappahannock and We Plant Trees to plant 50,000 trees this fall within their watersheds, particularly farms in Fauquier and Loudoun counties. They are looking to plant at least 60 trees for a riparian buffer or reforestation project at each location. There is no cost to the landowner. Volunteers are also needed to help plant the trees. Info: info@goosecreek.org.

VA Master Naturalists
VA Master Naturalists are a corps of volunteers who help to manage and protect natural areas through plant & animal surveys, stream monitoring, trail rehabilitation and teaching in nature centers. Training covers ecology, geology, soils, native flora & fauna and 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 techniques and reading data. Monitoring sites are accessible for easy collection. Info: waterquality@pwswcd.org, pwswcd.org.

PENNSYLVANIA

Middle Susquehanna River
There are many ways to get involved with the Middle Susquehanna Riverkeeper Association:
- **2020 Susquehanna Survey:** Your feedback on the Susquehanna River, its tributaries and programs is needed.
- **HERYN (Helping Engage our River's Youth with Nature):** Help engage young people in outdoor activities.
- **Susquehanna Stewards**: Deliver programming and information to people in their region and help to develop new initiatives. Info: middlesusquehannariverkeeper.org.
- **Water Reporter App:** Help track the health of various fish species in the Middle Susquehanna watershed by sharing photos, locations and other information about your catches via the app. Reports are made available to view via an interactive map at middlesusquehannariverkeeper.org.
- **Share Concerns:** The Middle Susquehanna Riverkeeper Association takes reports of any concern regarding the river or its tributaries very seriously. If you have a report of something out of the ordinary. Contact: Riverkeeper John Zaktansky at 570-768-6300, midsusriver@gmail.com.

MARYLAND

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 and its tributaries. Stream-Link raises funds through grant awards and corporate sponsorships to take on buffer planting projects at no cost to the landowner and without restrictions (no easement required). Its volunteers plant and maintain the young forest for at least three years to ensure an 85% survival rate. Interested landowners should fill out the form at streamlinkeducation.org/landowners. Info: streamlinkeducation.org/about, 301-473-6844, lisa.streamlink@gmail.com.

Anita C. Leight Estuary Center
Help out at the Anita C. Leight Estuary Center in Abingdon:
- **Invasinators:** 2–4 p.m. Nov. 15. Ages 14+ Remove nonnative invasive plants and restore native species. Learn why invasives are a threat to ecosystems; how to identify them; and removal and restoration strategies. Wear sturdy shoes and work gloves.
- iNaturalist Trek: 10:30–11:30 a.m. Nov. 14. All ages, 12 & younger w/adult. Use the iNaturalist app while searching for and collecting biodiversity data on plants and animals.

Registration is required for both workdays. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

Cromwell Valley Park
Help is needed at Cromwell Valley Park in Parkville:
- **Project Feeder Watch Training:** 10:30–11:30 a.m. Nov. 12. Adults. Learn how to count birds for science. After training, participants sign up for 1-hour shifts Wednesdays and Thursdays Nov. 18 through April 8. Training takes place outside. No registration.
- **Habitat Restoration Team:** 2–4 p.m. Nov. 14 & 21. (Cleanups are canceled if the weather is bad.) Remove invasive plants, plant natives and maintain restored habitat. Bring your own tools. Gloves and a mask must be worn for the initial work discussion. All volunteers must sign waivers; parents or guardians must sign waivers for ages 13–17. Work is inappropriate for ages 12 & younger. Wear long pants, closed-toe shoes and a hat. Bring a water bottle, and insect repellent. Meet at the Sherwood House parking lot. Volunteer three times to earn a park habitat restoration hat; five times, a handbook, *Native Plants for Wildlife Habitat & Conservation Landscaping: Chesapeake Bay Watershed*. Preregistration is required. Info: Laurie Taylor-Mitchell at lmitchell4@comcast.net. Groups of two or more who are interested in helping but cannot work on scheduled workdays should contact Taylor-Mitchell. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

Plant a streamside buffer
Stream-Link Education needs volunteers to help plant a streamside buffer 9–11 a.m. Nov. 14 at Libertytown Farm on Lingamore Creek in Frederick. Registration / info: streamlinkeducation.org/plantings.

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 or 800-285-8195. Evenings, weekends and holidays, call the Chesapeake Bay Safety and Environmental Hotline: 877-224-7229.

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.

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.
December issue: November 11
January/February issue: December 11

FORMAT
Submissions to ***Bulletin Board*** must be sent either as a Word or Pages document or in the body of an e-mail. Other formats, including pdfs 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

DOES YOUR EVENT OCCUR IN MID-JANUARY THROUGH MID-MARCH?

This is to remind organizations and centers with events or deadlines that take place between mid-January and mid-March that announcements for these items must reach the *Bay Journal* office no later than Dec. 11 if they are to run in the combined January-February 2020 issue. Please e-mail news about upcoming events to this address: kgaskell@bayjournal.com.

Breeding Bird Atlas project

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

Severn River Association

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

Patuxent Research Refuge

Volunteer in the Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Responsibilities include opening & closing store, helping customers select merchandise and operating the point-of-sale register. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.

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 November, December and January 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 help more frequently. Openings include helping with educational programs; guiding kayak trips and hikes; staffing the front desk; maintaining the trails, landscapes and pollinator garden; feeding or handling captive birds of prey; maintaining birds' living quarters; participating in CBEC's team of wood duck box monitors or 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

Lend a hand at Chesapeake Biological Laboratory's Visitor Center on Solomons Island. Volunteers, ages 16 and older, must commit to a minimum of 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 and size data using its Volunteer Angler Survey on a smartphone. Data are used to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs also have mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Mount Harmon Plantation

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

CONFERENCES

WATERSHEDWIDE

Coastal resilience webinars

The Horn Point Lab of the University of Maryland Center for Environmental Science has put together a virtual seminar series, Assessing Coastal Risk and Enhancing Resilience, featuring experts in coastal resilience. Seminars, which are open to the public, begin at 11 a.m. A question and discussion session is scheduled after each 30-minute seminar. Upcoming topics include:

- **Contrasting Storm Surge Barriers & Nature-Based Flood Mitigation for Port Estuaries:** Nov. 18. Philip Orton, Stevens Institute of Technology.
- **Coastal Ecosystem Services to Support Coastal Policy & Decision-Making:** Dec. 2. Ariana Sutton-Grier, University of Maryland.
- **Developing Standardized Geospatial Metrics for Salt Marsh Management & Restoration:** Dec. 9. Neil Ganju, USGS – Woods Hole Oceanographic Institute.

The Zoom webinar program can accommodate up to 500 participants; registration is required: zoom.us/webinar/register/WN_xh4KUkWVTsu-_X77JdA_1w.

PENNSYLVANIA

Stormwater workshops for townships

The Pennsylvania State Association of Township Supervisors is presenting its MS4 Great Ideas Stormwater Conference, 9 a.m.–3:30 p.m. Nov. 13 in Cumberland County. Select the technical or policy workshop track.

- **Technical Track** (Designed for consulting engineers, stormwater operations staff): Learn how to select competent BMP inspectors; work with road crews and public works departments to integrate green infrastructure improvements that reduce flooding and improve stormwater quality during normal maintenance and building operations; calculate the costs of BMPs to develop a realistic municipal stormwater budget; and work with private landowners to design and install BMPs that help a municipality achieve cost-effective compliance.
- **Policy Track** (Designed for those with managerial and administrative stormwater responsibilities): Learn to create partnerships with other municipalities and private stakeholders to improve compliance and lower overall costs; develop joint municipal pollutant reduction plans to lower overall costs; implement a rural stormwater fee to help farmers meet responsibilities at the lowest cost; and balancing the construction of gray & green infrastructure projects for cost and appearance reasons.

The registration fee of $125 includes lunch, breaks, certificate of attendance, workshop handouts. Info: James Wheeler at atbjwheeler@psats.org, 717-763-0930 x128.

EVENTS / PROGRAMS

VIRGINIA

VA Environmental Film Contest

The 11th annual Richmond Virginia Environmental Film Festival is accepting submissions for the 2021 Virginia Environmental Film Contest. The contest is open to state residents with films based on environmental topics pertaining to the state. Films of all formats and genres will be considered. A juried panel will select the winning films and award the $1,000 grand prize, $500 first prize; $100 best cinematography; $100 best short film; and two $100 honorable mentions. Films must be submitted by Dec. 31 to RVAEFF.org. Click the film contest button to be taken to FilmFreeway.com, which explains contest rules, deadlines and how to submit films. Winning entries will be announced Jan. 15. Award-winning films, as well as other submitted films, will be shown Feb. 12–28 at various venues in the Richmond area and/or streamed online. Specific venues, platforms will be announced later and comply with Covid-19 guidelines. Admission is free, open to the public. Info: put "rvaeff film contest" in search engine.

MARYLAND

Chesapeake Bay Maritime Museum

Events at the Chesapeake Bay Museum in St. Michaels, include:

- **Rising Tide Program:** 3:30–5:30 p.m. Tuesdays & Thursdays (in-person) and 3:30–5:30 p.m. Wednesdays (virtual). Grades 6–9. Both versions of the program offer challenging projects that build skills in design, woodworking and 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: welcome.cbmm.org.
- **Where Land & Water Meet - The Chesapeake Bay Photography of David W. Harp:** Through Sept. 20, 2021. Steamboat Building Gallery. Exhibit features work from throughout Harp's career. Included w/ admission. A virtual exhibition will be offered later.
- **Climate Change in the Chesapeake Speaker Series (Virtual) / Environmental Justice During a Syndemic - Challenges & Opportunities for Social Change:** 2 p.m. Nov. 18. Sacoby Wilson, University of Maryland associate professor of applied environmental health, will highlight challenges of the COVID-19 pandemic, explore how climate change will worsen the health outcomes for frontline and fence-line communities, then discuss how community engagement can improve the lives of people of color and other differentially impacted groups. Fee: $7.50. Info: cbmm.org/speakerseries.
- **Artist Talk / From Photography to Film - David Harp with Sandy Cannon-Brown:** 2 p.m. Dec. 9.

See **BULLETIN**, *page 44*

CHESAPEAKE CHALLENGE

ANSWERS

1. B 2. A 3. B 4. A
5. C 6. C 7. C

BULLETIN *from page 43*

Via Zoom. The pair will discuss films they have collaborated on. Fee: $7.50. Info / registration: cbmm.org/HarpArtistSeries.

■ **Climate Change in the Chesapeake Speaker Series (Virtual) / Climate Change & Racial Justice - the Resilience & Vulnerability of African American Communities on the Eastern Shore:** 2 p.m. Dec. 2. The story of Smithville — a historic African American community in Dorchester County — illustrates how cultural legacies of racial discrimination have unfairly increased the vulnerability of Eastern Shore African American communities to climate change impacts. Smithville native the Rev. Roslyn Watts and University of Maryland anthropologists, Christy Miller Hesed and Michael Paolisso, will discuss the history of Smithville and their work to build coastal resilience to climate change. Fee: $7.50. Info: cbmm.org/speakerseries.

Harmon Festival Yuletide Festival

The Yuletide Festival at Mount Harmon Plantation in Earleville takes place 11 a.m.–3 p.m. Dec. 5 & 6. The event includes tours of the manor house, adorned with Williamsburg-style decorations; a holiday decorations sale featuring items made from greens growing on Harmon's grounds: boxwood, magnolia, pine and holly; hearth-cooking demonstrations in the colonial kitchen, where visitors can sample freshly made holiday treats and wassail punch; and a holiday marketplace with artisans and hand-crafted items. Tickets: $10; ages 12 & younger are free. Proceeds benefit Mount Harmon Plantation. Tickets / info: 410-275-8819, info@mountharmon.org.

Program pairs novice, veteran hunters

The Department of Natural Resources' new Maryland Mentored Hunt Program pairs new, novice or lapsed hunters of any age with skilled veteran hunters, who will help them build their skills, culminating in a hunt. Mentors and mentees submit applications and will be matched based on agency review and other criteria. The pair works at its own pace to schedule all aspects of the hunt. All participants are required to follow the state guidance on preventing the spread of COVID-19. The program encourages using video meetings, email, texts and phone calls as much as possible. For in-person meetings, individuals must practice social distancing and wear masks. Info: Chris Markin at Christopher.markin@maryland.gov, or put "Maryland Mentored Hunt Program" in your search engine.

Cromwell Valley Park

Programs at the nature center at Cromwell Valley Park in Cockeysville include:

■ **LBJs - "Little Brown Jobs":** 1–3 p.m. Nov. 14. Adults. Search for, learn about little brown jobs, aka sparrows, finches and wrens. Fee: $4.

■ **Orienteering:** 1–3 p.m. Nov. 15. Ages 8+ Learn the art of navigating with a compass. Learn how to navigate the woods and meadows of Cromwell using the park's Eagle Scout orienteering map. Bring your own compass and wear sturdy shoes. Fee: $4.

■ **Let's Talk Turkey:** 1–2 p.m. Nov. 21. All ages. Learn about the park's turkeys: Gravy, Tater & Drumstick. Fee: $4.

■ **From Flint to Flame:** 1–3 p.m. Nov. 22. Meet at the Primitive Tech Lab. Ages 10+ Learn how to make fire using flint & steel. Fee: $4.

■ **Black Friday Hike:** 7–8:30 p.m. Nov. 27. Ages 8+ Take a night hike with a naturalist. Bring a flashlight and wear sturdy shoes. Fee: $4.

■ **Scout Day / Debris Shelters:** 1–3 p.m. Nov. 28. Meet at Primitive Tech Lab. Ages 5–11 w/ adult. Learn how to make a winter debris shelter. This program is for both Girl and Boy Scouts. Participants receive a Cromwell Valley Park logo patch. NO SIBLINGS. Fee: $5 per Scout.

■ **Goodnight Groundhog:** 1–2:30 p.m. Nov. 29. All ages. Learn about woodchucks, search for their burrow. Fee: $4.

Preregistration required: cromwellvalleypark.campbrainregistration.com. Info: (including COVID-19 protocols): cromwellvalleypark.org, info@cromwellvalleypark.org, 410-887-2503.

Anita C. Leight Estuary Center

Programs at the Anita C. Leight Estuary Center in Abingdon include:

■ **Talkin' Turkey:** 1:30—3 p.m. Nov. 14. Ages 10+ Learn about wild turkeys. Fashion a turkey feather quill pen. Fee: $7.

■ **Watersheds & Wastewater:** 2–3:30 p.m. Nov. 21. Ages 12+ Discover how to reduce our impact on watersheds. Learn where wastewater goes and simple things to do at home to reduce runoff. Fee: $4.

■ **Owl Prowl:** 5–6:30 p.m. Nov. 21. Meet at Bosely Conservancy. Ages 8+ (16 & younger w/ adult) Look, listen for owls. Fee: $5.

■ **Preparing for Winter:** 1–2:30 p.m. Nov. 22. Ages 4+ Learn how animals prepare for winter: who sleeps, who freezes and who moves away. Fee: $4.

■ **Tails & Tots:** 3:30 p.m. Nov. 22. Ages 6 & younger. Stories, songs and animal movement. Free.

■ **Jerusalem Mill Trail Trek:** 10–11:30 a.m. Nov. 28. Meet at Jerusalem Mill Village. Ages 6+ Explore trails near the historic village. Fee: $3.

■ **Critter Dinner Time:** 1:30 p.m. Nov. 28. Learn about turtles, fish and snakes while watching them eat. Free. This is not a drop-in event.

■ **Tracking Nature:** 3–4:30 p.m. Nov. 28. Ages 5+ Learn basics of spotting animal tracks and signs. Create track models then test your "reading" skills on the trail. Fee: $4.

All programs require preregistration. Except where noted, ages 12 & younger must be accompanied by an adult at all programs. Be advised that all programs take place outdoors with social distancing; face masks are recommended. Programs listed in the calendar are for individuals and families. Groups who would like to arrange a program should contact the center. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

RESOURCES

WATERSHEDWIDE

Property pointers

The Alliance for the Chesapeake Bay offers resources for property owners who want to make their landscapes more friendly:

■ **Wood you Like to Learn about Forests?** Put "Alliance Websites, Resources, Videos, Blogs" in your search engine, then scroll to the Tree Talks under Videos. Titles include: *How to Plant A Tree, What's That Conifer?, Live Staking, Gray Dogwood, Boxelder, Poison Ivy, Black Raspberry, Pawpaw, Blackgum, Snags, Witch Hazel, Christmas Fern, White Cedar, Mountain Laurel, Atlantic White Cedar,* and *A Hobbyist's Guide to Maple Sugaring.*

■ **Bouquets for the Bay:** Visit NativePlantCenter.net to find the perfect native species for your landscape.

■ **Right as Rain Landscape:** Learn how to design a stormwater runoff plan to help you better manage water running off your property. Visit the Alliance for the Chesapeake Bay's Yard Design Tool at stormwater.allianceforthebay.org.

Stormwater class

The Alliance for the Chesapeake Bay's Municipal Online Stormwater Training Center's Dig Once Course suggests how local leaders can integrate green infrastructure into community capital projects: road construction and school & park improvements. Interactive lessons and videos in a user-friendly format give communities the tools to build and enhance local stormwater programs. Info: mostcenter.org.

Wetlands Work website

The Chesapeake Bay Program's website, Wetlands Work, at wetlandswork.org, connects agricultural landowners with people and programs that can support wetland development and restoration on their land.

Bilingual educator resources

Educational programs are available in English and Spanish from the Interstate Commission on the Potomac River Basin. Info: potomacriver.org/resources/educator.

Marine debris toolkit

The National Oceanic and Atmospheric Administration's offices of National Marine Sanctuaries and Marine Debris Program have developed a toolkit for students and educators in coastal and inland areas to learn about marine debris and how to monitor local waterways. The toolkit supports efforts to reduce impacts on marine ecosystems through hands-on citizen science, education and community outreach. Info/search engine: marine debris monitoring toolkit for educators.

MARYLAND

Get the AccessDNR app

The Department of Natural Resources' free AccessDNR app includes maps and directions to state parks, trails, wildlife management areas, boat launches and water access sites; state park activities and amenities by location; hunting season details by date with an option for hunters to report their harvest directly to DNR; a location-based sunrise/sunset display; Trophy Case, where hunters can upload harvest photos and share through Facebook, Twitter or by email; fish and shellfish identifier; tide time tables; state fish records; hunting, fishing and boating regulation guides; and breaking DNR news and alerts. The app requires data access for some features. Download the app at Google play or iPhone App Store.

Baltimore Biodiversity Toolkit

To help meet habitat needs of native plants and & animals, the Baltimore Biodiversity Toolkit identifies species that represent habitats within and historic to a community. It shows how to support specific wildlife needs; helps citizen scientists monitor and collect data; and develops a culture of conservation and stewardship. Using 20 ambassador species from four habitats, the toolkit helps prioritize community greening projects based on representative species, citizen science data and spatial analysis that includes social, economic and ecological indicators. Info: fws.gov.

VIRGINIA

Watershed Capsules

Prince William (VA) Soil and Water Conservation District's Watershed Capsules, which teach students about the important functions of watersheds, are available, first-come, first-served. Info: pwswcd.org/capsules.

Floatable monitoring program

Help the Prince William Soil & Water Conservation District in Manassas assess and trace trash in streams to reduce nonpoint source pollutants in urbanized and industrialized areas in relation to the County's Municipal Separate Storm Sewers (MS4) permit. Cleanup supplies provided. Info: waterquality@pwswcd.org.

Turf / lawn programs

For information on Prince William Cooperative Extension's 12 Steps to a Greener Lawn / Building Environmental Sustainable Turf BEST Lawns low-cost, research-based programs for lawn education, contact: bestlawns@pwcgov.org, 703-792-4037. ■

Clean Water Partnerships accelerate conservation efforts

By Jenna Mitchell

As we near the 2025 Chesapeake Bay pollution reduction goal deadline, it is clear that partnerships are imperative to our success, as no one entity is capable of reaching these goals alone.

One Alliance for the Chesapeake Bay partnership has grown tremendously in recent years, with hopes of paving the way for the future of the agricultural industry in the Bay watershed. The Turkey Hill Clean Water Partnership, comprising Turkey Hill Dairy, the Alliance, and Maryland & Virginia Milk Producers Cooperative Association has experienced rapid success in supporting farmers supplying Turkey Hill Dairy with conservation action.

The partnership began in 2018 at the Alliance for the Chesapeake Bay's Businesses for the Bay Forum, which urged companies to consider how they could change their operations to improve water quality. Conversations between the Alliance and the dairy led to the Turkey Hill Clean Water Partnership.

This collaboration, the first of its kind in the region — and perhaps the country — has Turkey Hill fully committed to building conservation into its supply chain. The business is the largest dairy distributor in Lancaster County, PA. Because the dairy has one of the largest ecological footprints in the county, it and the Alliance conceptualized a partnership that focused on Turkey Hill farmers taking meaningful steps to improve local water quality. The MDVA cooperative plays an important role in the partnership, as they are Turkey Hill's sole dairy provider.

Through the partnership, the dairy is requiring all of its milk suppliers to obtain and implement a conservation plan, a tool designed to help better manage the resources on farms. This commitment, which has been officially written into Turkey Hill's contract with the MDVA cooperative, is more than just a requirement, it's an incentive. Turkey Hill has opted for a "carrot and stick" approach, with the Alliance and the MDVA cooperative supporting their farmers in achieving this new standard.

Cows line up for a group photo on a Lancaster County, PA, farm. Turkey Hill Dairy, the largest dairy distributor in the county, is requiring all of its milk suppliers to obtain and implement a conservation plan. (Maryland Virginia Milk Producers Cooperative)

To date, the partnership has covered 100% of the cost of writing conservation plans for 24 farms; installed 14 structural agricultural best management practices, such as manure storage facilities, heavy use area protection and barnyard stabilization.

Participating farmers' current conservation level and future goals have been assessed. Farmers have been supported with more than $3 million in funding through various sources, including: National Fish and Wildlife Foundation, U.S. Department of Agriculture Natural Resources Conservation Services, PennVest, and Pennsylvania Department of Conservation and Natural Resources.

Farmers have been truly appreciative of the support offered by the Turkey Hill Clean Water Partnership. "Working together with the partnership has allowed our farm to design and complete many improvements to our operation," said Chris Landis of Worth the Wait Farms in Lancaster County. "This has impacted our operation by allowing us to manage our livestock and cropping in a responsible manner leading us to implement the best conservation practices that we can to ensure a sustainable future for generations to come."

The Alliance was recently awarded an additional $500,000 grant from the National Fish and Wildlife Foundation's Small Watersheds Grant program to continue its support of dairy farmers. Much work still needs to be done. The partnership roughly estimates that $20 million is needed to fully bring partnership producers up to the new conservation standard. The partnership is continuing to seek funding sources to complete this work.

Besides setting sustainable goals for the farmers supplying Turkey Hill, the partnership also provides a model for the entire dairy industry. "The hands-on approach of working alongside each producer is important to not only Turkey Hill, but to the dairy industry overall, as it can accelerate conservation action and motivate more businesses to take a similar approach," said Turkey Hill's CEO, Tim Hopkins.

From its inception, the partnership was built for replication. This project began with an NRCS Conservation Innovation Grant with the goal of demonstrating that leadership within the private sector can accelerate conservation action. In fact, the Alliance hoped from the beginning that the example the partnership sets would motivate additional businesses to take a similar approach in improving their operations' impact on local rivers and streams. As the partnership has grown, participants have put significant energy into making the effort scalable and replicable. Thanks to this model, the Alliance and the MDVA cooperative are in discussion with two other large corporations about similar efforts. These major food companies receive milk from hundreds of farmers and have significant potential water quality impacts on agricultural lands throughout the Chesapeake Bay watershed.

Additionally, as a result of partnering with Turkey Hill and the Alliance, the MDVA cooperative has developed the goal of becoming the first dairy cooperative association to support all of its member farms in achieving full compliance with conservation standards. The MDVA cooperative is evolving their structure and mission to accomplish this ambitious goal. In response to its commitment to the partnership, the MDVA cooperative has quadrupled their sustainability workforce. It has also made it an expressed objective to develop and support the sustainability goals of their clients, even in an economic climate that may otherwise be difficult for many dairy farmers.

"We have seen tremendous success through our partnership with Turkey Hill Dairy and the Alliance for the Chesapeake Bay," said Lindsay Reames, director of sustainability and external relations for the MDVA cooperative. "Our focus now is to find revenue streams to support our ongoing work and the projects our members need help implementing. Whether it's creating an updated nutrient management plan or providing cost-share support for the construction of a new manure storage facility, the Turkey Hill Clean Water Partnership is doing good things for our farmers, our customers, our communities and our streams — and we want to keep that forward momentum going."

The Alliance will continue to work with the MDVA cooperative, Turkey Hill Dairy and others to further refine the partnership model by increasing its scale and replicability. In time, the partnership says that it believes that this approach to conservation will change the market itself and become a standard operating procedure within the agricultural industry. ■

Steward's Corner is a column from the Alliance for the Chesapeake Bay. Jenna Mitchell is the Pennsylvania state director for the Alliance.

‘Molting pot’: Herring gulls change with their challenges

By Mike Burke

The herring gull juvenile, front, takes several years to reach its complete adult plumage, right. (Dick Daniels, carolinabirds.org / CC BY-SA 3.0)

Like many others, I have been caught up in the genealogy craze. Digital databases of population records and user-friendly software have made research into one’s ancestors easier than ever. I knew little of my family history, so the exercise has been enlightening.

I spent a morning last year at a beachfront house we were renting, piecing together the story of my Irish forebears. As I slipped my day’s notes into a folder, I could hear the raucous call of gulls. They were swirling, crying and looking for food scraps.

Some people dismiss these birds as “rats with wings,” but I was curious. Grabbing my jacket, I went out for a closer look.

A pair of noisy birds were joined by a third and then a fourth. These bulky, white-bodied gulls with gray wings were raising a ruckus, but they were about to be disappointed. I saw a neighbor hoist a well-sealed trash bag into a dumpster. He then carefully flipped the lid closed. No free eats that day.

Herring gulls (*Larus argentatus*) are the most numerous, widespread and adaptable of the large gulls that breed on this continent.

Adults are about 2 feet long from bill tip to tail end. Wingspans reach more than 4 feet, and the birds weigh 2.5 pounds.

From September to February, adult herring gulls have gray-brown streaking on their necks and heads. Their bodies and tails are brilliant white year-round. The light silver-gray wings end in black tips with white spots. The yellow bill is deep but fairly narrow. A subterminal red dot on the bottom bill helps with identification.

Come March, these gulls will molt into their breeding plumage, resulting in all-white heads and necks to go with the rest of their bodies.

Like many gulls, the herring takes several years to reach its complete adult plumage. Juveniles are uniformly brown. Feathers becomes paler with each annual molt cycle. Typically, when birds reach age 4, their adult palette of white, gray and black is complete. Sexes look alike.

The herring gull is closely related to the lesser black-backed gull as well as the glaucous-winged, Iceland and Thayer’s gulls. Frequent hybridization among these species occurs. With all those color variations and hybrids, identifying herring gulls can be challenging.

To make matters worse, scientists can’t even agree on what constitutes a herring gull. The authoritative Birds of the World database reports there are five subspecies of herring gull found in three groups over four continents. Then, the reference work adds, some scientists count up to nine subspecies in five groups. Confused yet?

In North America, herring gulls breed from Alaska to the Maritime Provinces and down through the Great Lakes. Along the Atlantic Coast, a year-round population is established from Newfoundland to North Carolina. The species winters along the Pacific coast from Alaska to parts of Central America.

Winter birds can also be found in the U.S. South and Gulf Coast. During migration, they can be seen in every state and province.

Herring gulls are omnivores. They eat fish, shellfish, smaller birds, eggs, worms, bugs, carrion and human trash.

Typically, they forage for food on land (from pristine beaches to farm fields to landfills) or in the water (from tidal pools to man-made reservoirs to drainage ditches). They range from saltwater environs to freshwater lakes and river systems.

These birds, which can live 30 years or more, mate for life.

Over a monthlong period, parents share the responsibility of sitting on the eggs. After the new birds hatch, mom and dad feed the chicks for 45–50 days before the youngsters leave the nest. Even then, parental involvement continues, supplementing the diet of the young birds for another two months.

These are intelligent, highly adaptable creatures, but they are not immune to every threat. Though still quite numerous, herring gull populations in North America have plummeted more than 80% in the last 50 years. Climate change and massive human alterations of the landscape are the prime reasons.

A bit of research has revealed that my Irish ancestors left the Emerald Isle during the Great Hunger, also known as the Potato Famine. I was surprised to learn that John Burke and his wife, Bridget Grady, went first to England to work in the textile mills. They raised a large family before uprooting them all 20 years later to ship out for New England, becoming part of the great wave of Irish immigrants in the 1880s.

As I researched the herring gull, I kept seeing reflections of my own family. Lots of relatives with confusing names, blurred boundaries, long periods of parental devotion, endless adaptation to challenging circumstances, scraping by with whatever food was at hand. This wasn’t an exercise in anthropomorphizing the gulls. It felt more like a recognition that we humans aren’t so different.

On a personal note, my 140-year generic history about desperate immigrants coming to North America was giving way to a rich human story about actual ancestors. Increasingly, the survival story of these noisy seagulls was revealing a similarly rich tale, full of avian families connected across oceans, struggling to adapt in a constantly changing world. ■

Mike Burke, an amateur naturalist, lives in Mitchelleville, MD.

Hungry for more joy in your world? Feed the birds!

By Kathy Reshetiloff

It seems that just as we're beginning to enjoy the autumn season, fiery colors are replaced with grays and browns; dry leaves carpet the landscape. Meanwhile, many birds have flown to warmer climates in the southern United States, Caribbean, Mexico and Central and South America.

But not all birds fly south for the winter. These hardy residents bring a splash of color and hours of entertainment to backyards across the Chesapeake watershed.

Birds are warm-blooded animals and must maintain a constant body temperature as the temperature around them changes. To survive, they must spend much of their time eating so they can generate enough heat. It's a vicious cycle though; they must eat to keep warm so they can gather more food.

During the warmer months, insects and other invertebrates provide much of their nutrition. Birds that are able to switch from an insect to a seed diet can stay put throughout winter. Finding food and water during the colder months, though, can still be a formidable task. Fortunately for these avian residents, bird-feeding is a popular and relatively easy activity.

Keep in mind that a feeding area should not only provide birds with easy access to food but also offer nearby protective cover from predators. Set up feeding stations near large shrubs, trees or fences. Evergreen trees and shrubs, like pines, hollies and cedars, afford excellent cover and protection, as well as a natural source of food.

By using particular styles of bird feeders and different seed mixtures, you can attract specific bird species to your yard. Mixed birdseed on a simple tray or platform feeder mounted above the ground attracts sparrows, dark-eyed juncos, blue jays, starlings and grackles.

A tube feeder filled with sunflower seed is sure to delight some of the smaller species like the American goldfinch, Carolina chickadee and tufted titmouse. Thistle seed in a tube feeder is a favorite of American goldfinches, purple finches, house finches, chickadees and a variety of sparrows.

Cage-style suet feeders hold square cakes of "rendered" suet, which is processed to kill bacteria. Suet attracts chickadees, nuthatches, brown creepers, woodpeckers, wrens and cardinals. Remember to hang suet feeders high enough so that dogs, cats and other animals cannot reach it.

To attract a Carolina wren, hang a caged feeder with a rendered cake suet inside. (Evan Bornholtz / CC BY-NC-SA 2.0)

Often, squirrels visit bird feeders and, in many cases, can become a nuisance by consuming the majority of seed. Squirrels can also damage feeders by chewing through plastic and wooden parts. One way to curtail this problem is to erect squirrel guards, metal cones placed above hanging feeders and below feeders mounted on poles.

Many people solve their squirrel problem by creating a squirrel feeding station away from bird feeding areas. Uncooked corn on the cob is a favorite of squirrels and can be used to lure squirrels away from a bird feeder.

You don't need commercial feeders to attract birds. Peanut butter spread on pine cones and sweet gum balls, then rolled in a birdseed mixture and hung from trees will be popular with birds that hang while eating: woodpeckers, nuthatches and chickadees. Hung dried fruit is a favorite of some larger species: mockingbirds, woodpeckers, starlings, cedar waxwings, cardinals and blue jays.

Fall-fruiting plants — dogwood trees, mountain ash, winterberries — are great food sources for both migratory and resident birds. Of course, nut-producing trees like oak, hickory, chestnut, butternut, walnut and hazelnut, provide meals for a variety of birds, blue jays, woodpeckers and titmice, that feed on broken nuts.

Winter fruits remain on their plants long after they ripen in the fall. Many are not palatable until they freeze and thaw a few times. Examples of these include Virginia creeper, sumacs and American bittersweet.

We often forget that birds also require water. Birdbaths or even just a shallow pan or bowl of water will suffice. Keep in mind that cold temperatures can freeze water sources, making them inaccessible to birds. Keep water sources ice-free.

Like feeders, water sources should be placed off the ground and positioned near trees or bushes.

Once birds become accustomed to your feeding stations, they will continue to return. Do not suddenly cut off the food supply, especially during periods of severe weather.

Birds obviously benefit from feeders, but they also bring a lot of enjoyment to people. The National Survey of Fishing, Hunting and Wildlife-Associated Recreation, conducted every five years through the U.S. Fish and Wildlife Service and U.S. Census Bureau, shows just how much

In addition to seed feeders, white-breasted nuthatches are attracted to suet and peanut butter. (Courtney Celley / U.S. Fish and Wildlife Service)

Americans love birds. The most recent survey in 2016 found that 81 million people participate in watching, feeding and photographing wildlife and the most popular pastime around the home was feeding birds! A little more than 57 million Americans fed wild birds, spending roughly $4 billion on food alone.

Attracting and feeding birds awakens a lifeless yard, porch or patio. Visiting birds brighten the brief, gray days in autumn and winter. By providing for their needs, we bring sound, color and joy to our lives.

Visit fws.gov//birds/bird-enthusiasts.php for information. Join a citizen science effort like Project Feederwatch or contact a local birding group in your area. ■

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