CHESAPEAKE
# BAY JOURNAL

September 2024 Volume 34 Number 6

Independent environmental news for the Chesapeake region

# More osprey reproduction problems found around the Bay

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## UNDERWATER GRASSES

Bay grasses increase for third year in a row PAGE 11

## STORY OF SMITH CREEK

Data shows complexity of reducing farm runoff PAGE 16

## RIVERSIDE WALL CLIMBING

Bridge remnants offer challenge in historic setting PAGE 28

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*Pennsylvania has drafted its first overarching management plan for state forests in 30 years. Read the article on page 14. (Courtesy of the PA Dept. of Conservation and Natural Resources)*

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## ON THE COVER

*Young ospreys sit in a nest on Poplar Island in Maryland's portion of the Chesapeake Bay. (Olivier Giron/ Chesapeake Bay Program)*

*Bottom photos: left by Matt Rath/ Chesapeake Bay Program, middle by Karl Blankenship, right by Lauren Hines-Acosta*

## CORRECTION

*An article about dolphin research in the July/August issue incorrectly reported the distance that pile-driving for ocean wind turbine foundations can be heard. The distance is about one kilometer in the air and about 70 kilometers, or 44 miles, in the water.*

## EDITOR'S NOTE

# The Bay Journal readers survey is underway – send yours today!

It's one of my favorite times of year. (Not the season, although I like that too.) It's time for the *Bay Journal* survey, our best opportunity for collecting feedback from thousands of readers. If you subscribe to the *Bay Journal* directly, the survey has already arrived in your mailbox, and you can send your response back to us in the enclosed envelope. If you pick up the *Bay Journal* at a library or other location, you can take the survey online at *tinyurl.com/bayjournal2024*. Anyone who prefers to respond online can use that link.

The survey is important to us for many reasons, one of which is this: *Bay Journal* readers are a special group. You have a demonstrated interest in environmental issues, more than most people in the general public. You are likely to be well informed about those topics and engaged with ways to improve our shared natural resources for the benefit of humans and wildlife alike. So we are eager to learn about the topics that matter to you, the ways you use content in the *Bay Journal,* and any ideas you have for how we can improve.

This year, we are also interested in your opinions about the overall health of the Chesapeake Bay and its rivers.

We recognize that there is a mixed bag of messages, from a wide range of sources, with both good news and bad news about the Bay cleanup effort. Our team is continually working to sort through it and provide accurate information in context for our readers. So we'd really like to know how you think the Bay and its rivers are doing, from your local perspective. It will help shape our reporting in the year to come.

I really hope you'll participate in this year's survey. We'll share what we learn through the survey in a later issue of the *Bay Journal*. It will take some time to process the thousands of responses we typically receive, but it's worth it.

*— Lara Lutz*

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## BY THE numbers

**4,480**
Square miles of surface area on the Chesapeake Bay and tidal portion of its major rivers

**195**
Miles of length along the Rappahannock River, the longest dam-free river in the Bay watershed

**65,649**
2023 average for cubic feet of water per second flowing into the Bay from rivers

**79,000**
Long-term average for cubic feet of water per second flowing into the Bay from rivers

**282,000**
Approximate acreage of wetlands along the Bay and its tidal rivers

**705**
Square miles of Delaware in the Bay watershed, the least of any state

# Our fascinating freshwater mussels

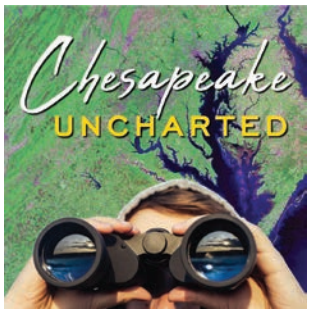
Freshwater mussels help streams and rivers by filtering pollutants out of the water. That helps conditions downstream in the Chesapeake Bay, too. But there is far more to these creatures than environmental benefits.

Mussels need fish to host their offspring. Some attract fish by making a lure that resembles prey. Others have evolved to jump up and clamp onto a fish's face. Once a mussel attaches, it expels larvae onto the fish's gills. The offspring enjoy a free ride upstream as they grow.

- People made buttons from mussel shells in the early 1900s. It's one of many factors that reduced their population.
- Mussels can survive as long as 100 years in an ideal environment.
- Mussels have a large muscular "foot" that allows them to move short distances and find a place to reproduce.
- One freshwater mussel can filter up to 15 gallons of water a day.
- North America has the highest diversity of freshwater mussels in the world, with more than 300 species, 50 of which reside in the Chesapeake watershed. Other countries have 20 or fewer species.

*Top photo: A plain pocketbook mussel presents a fake fish lure with an eye spot. Lower photos: a variety of Bay native mussels. (Top by Ryan Hagerty/ U.S. Fish & Wildlife Service, lower by Bay Journal staff)*

## Catch up on our Chesapeake Uncharted podcast




The last episodes of *Season 3: Wave Makers* are posted. Listen through your streaming service or online at **bayjournal.com/podcasts**.

## More news at bayjournal.com

In case you missed them, check out these recent articles available only on our website.

- Gunpowder Riverkeeper threatens to sue over muddy runoff
- PA law seeks to make state a carbon storage center
- Baltimore harbor gains "floating wetlands" and a hint of its marshy past
- Chesapeake region awarded $700 million in federal climate funding
- James River Association opens education center
- Southern MD utility agrees to fix chronic sewage overflows, pay fine

# ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to environmental reporting in the Chesapeake Bay region. *Bay Journal* reporting reaches an average of approximately 250,000 people each month through news articles, columns, films and the *Chesapeake Uncharted* podcast.

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## BAY JOURNAL NOTEBOOK

*Lauren Hines-Acosta of the Bay Journal visits the Darlington Oak, a national champion tree in Richmond, for an upcoming travel article. (CJ Jackson)*

# A Bay Journal summer: trees, fish, trails, salt and caterpillars

Summer days have drifted away, but our staff made the most of them while they were here.

While the trees were in full array — and in the heat of the day — staff writer **Lauren Hines-Acosta** went on a hunt for some of the biggest and oldest among them. Following vague directions from Virginia Tech's Big Trees website on a sweltering July day, she finally found the champion tree she was after in Richmond's Maymont Park. Lauren made sure to write clear directions for readers in a forthcoming travel article about a few of the region's iconic trees.

Lauren also ventured down the length of Virginia's Northern Neck to Reedville. There, for a future audio piece, she toured the Omega Protein plant to learn how menhaden are converted into fish meal and oil. Lauren also strolled around the smalll Northern Neck fishing town with a microphone to record other sounds and voices.

Staff writer **Ad Crable** visited one of the Lancaster Conservancy's 50 nature preserves for an upcoming story. His article looks at equitable access to outdoor spaces and a pair of preserves that have been outfitted with more approachable trails for people in wheelchairs and kids in strollers. Three more preserves will be outfitted with such trails soon, he reports.

On the Eastern Shore, staff writer **Jeremy Cox** spent a couple of days at the S.A.L.T. (Salinity Affected Lands in Transition) conference learning about the challenges that saltwater intrusion is bringing to farmland. After the conference, Jeremy visited croplands that were left sandy, bare and virtually devoid of life by the increasing presence of salty water. The first article in his series on this topic appears in this month's issue.

Staff photographer **Dave Harp** has been spending hours (and hours) recently with caterpillars and butterflies, trying to capture time-lapse footage of monarchs emerging from their chrysalises. Look for it soon in a new *Bay Journal* film. He's a little jealous that staff writer **Whitney Pipkin** captured such footage on her phone a few years ago while raising monarchs for releasing with her kids.

# NEWS briefs

LOCAL
REGIONAL
NATIONAL

## Crisfield launches counter-attack on flood problems

A small town threatened by sea level rise on Maryland's Eastern Shore is getting a big boost from the Federal Emergency Management Agency in its fight against flooding.

Crisfield is receiving $36 million from FEMA's Building Resilient Infrastructure and Communities program, the agency announced July 15. The funding is slated for the construction of the first of two phases of a massive public works effort to protect the city of 2,500 residents from tidal flooding and storm surges.

The first phase, dubbed the Southern Crisfield Flood Mitigation Project, is designed to provide up to 3.5 feet of flood protection. Once the second phase — the "Northern Crisfield" half of the project — is completed, both areas will be protected up to the 5-foot level, officials say.

Plans call for constructing a tidal flood-protection barrier that will surround the project area. The project also will add new storm sewers, swales, improved ditches, pump stations, storage facilities and wetlands. Along the perimeter, tide gates will be installed to prevent water from entering the drainage system.

Crisfield Mayor Darlene Taylor called the funding "nothing short of phenomenal."

Crisfield's plight in the face of climate change is widely seen as a bellwether for rural coastal communities in the Chesapeake Bay region and beyond. Given their modest budgets and limited staffs, smaller towns often face greater difficulty accessing climate resources, compared with their more populous counterparts.

Construction isn't expected to begin until at least 2026. Crisfield officials say they plan to apply for grants for the northern half of the project this fall.

*— J. Cox*

## $100 million gift to VIMS will elevate its global reach

The Virginia Institute of Marine Science received a $100 million gift on July 24 to support research that will help coastal communities around the world adapt to threats from climate change, sea level rise and rapid development.

The gift from philanthropist Jane Batten will support the newly named Batten School of Coastal & Marine Science and was described by VIMS as the largest contribution ever made to a university for a school dedicated to coastal and marine science.

It is also the largest gift to William & Mary, the university of which VIMS is a part.

VIMS said its new school seeks to become the "premier global institution" for coastal and marine sciences. It will seek to attract students and scientists from around the world to work with various stakeholders and with the public and private sectors to devise solutions to the complex challenges facing coastal and marine environments.

"This gift propels us forward toward great promise and progress," Batten said. "I am confident that this will spark significant change, building resilience in coastal communities in the commonwealth and across the globe for generations to come."

Rapid growth and climate change are deteriorating the ecological, economic and social stability in coastal communities and marine systems not only around the Chesapeake Bay, but around the world. About 3.2 billion people globally and 128 million in the U.S. live near coastlines, including 5 million in Virginia.

VIMS, located in Gloucester Point near the mouth of the York River, has long studied wetlands and coastal and marine systems. It also makes policy recommendations as part of its legal mandate is to provide scientific advice to the state. The new gift will help elevate that work to the global scale.

"We have a geographical advantage, expertise advantage and historical presence in this area," said Derek Aday, VIMS director and dean of the Batten School. "We also have the breadth and depth in coastal and marine systems to allow us to take on very significant challenges that other places aren't equipped for."

VIMS was established in 1940 and became a part of William & Mary in 1979. Batten's late husband, Frank Batten, served on William & Mary's Board of Visitors in the 1990s. *— K. Blankenship*

## Report recommends a network of wildlife corridors in PA

A legislature-ordered study recommends Pennsylvania move forward with building a network of wildlife corridors, including road-crossing structures and better connectivity between forests.

Vegetative wildlife crossings over and below roads would reduce collisions with vehicles while helping wildlife access important habitat areas,

*See* **BRIEFS**, *page 6*

# briefs

*From page 5*

concludes the report prepared by the Legislative Budget and Finance Committee. Fish and amphibians could similarly be helped by roadway culverts that allow fish passage, the study said.

Road safety is an important benefit, too. Pennsylvania led the nation in animal-vehicle collisions reported to one major insurance carrier during a recent 12-month period.

The report was authorized by state lawmakers in 2023 with bipartisan support.

The study's recommendations, if enacted, may help guide the use of a $840,000 federal grant that PennDOT, the state's transportation agency, received in late 2023 to create wildlife crossings.

*— A. Crable*

## VA scientists investigate mass oyster die-offs

The Virginia Institute of Marine Science released a new report in June on the unexplained massive die-offs at oyster farms. The report is from a two-day workshop in January. Over 25 oyster aquaculture experts discussed their latest studies on what is called SUMS, or sudden unusual mortality syndrome.

The syndrome was first reported in 2012. It affects farmed oysters during peak reproduction time between May and early July. According to VIMS, mortality can exceed 70% at aquaculture locations across the Atlantic and Gulf coasts.

The report ruled out common oyster diseases like Dermo and MSX as the sole or primary culprits. Instead, researchers theorize that stressors from the environment and aquaculture cultivation methods play a large role.

One theory that emerged from the workshop focused on the oyster genetics. Triploid oysters have three chromosomes and can't reproduce. Oyster farmers like to raise them because all the bivalves' energy goes toward growth. So, some researchers from the workshop received a grant to compare how triploid and non-triploid oysters do under multiple stressors.

Researchers also explored how salinity, water temperature and the presence of algae during cultivation affected oyster species differently.

In the future, scientists hope to understand these periods of mass deaths and analyze the genetics of oysters that survived. The group also suggested breeding oysters for general resilience instead of resistance to just one stressor.

The group agreed that the aquaculture industry and research community must collaborate and communicate more to solve the problem. They also want to create an emergency response network.

The syndrome does not appear to pose any human health risks from eating oysters.

*— L . Hines-Acosta*

## More acres added to Crow's Nest Preserve in VA

Another 200-plus acres have been preserved as part of the growing footprint of a natural area near the bustling I-95 corridor of Northern Virginia.

First dedicated in 2008, the Crow's Nest Natural Area Preserve in Stafford County, VA, now encompasses more than 3,300 acres of land that juts between two tributaries to the Potomac River. The landscape is defined by "ecologically significant" upland forests and forested wetlands, with deep ravines and forests of various ages.

The Crow's Nest peninsula includes 60% of the marshes in Stafford County and some habitats that are considered globally rare. The landscape provides nesting sites for bald eagles and king rails, as well as habitat for about 60 species of migratory songbirds. The surrounding waters support dozens of fish species, including federally endangered shortnose sturgeon and seven species of mussels.

The Virginia Department of Conservation and Recreation owns and manages the preserve in partnership with Stafford County and the Northern Virginia Conservation Trust.

The latest acquisition includes marshes along Accokeek Creek, where, as recently as last year, staff have documented the presence of hard-to-find wetland species like the beautiful least bittern, a small heron.

Funding for the acquisition came through a grant from the Virginia Land Conservation Foundation.

*— W. Pipkin*

## PA bans invasive plants from use along state roadways

A new state law requires the Pennsylvania Department of Transportation to use native grasses and plants along rights of way for new state roads and as part of repair work on its 41,600 miles of existing roads.

The new standard was passed by both houses in the state legislature and then signed into law in July by Democratic Gov. Josh Shapiro.

In the past, PennDOT has used invasive nonnatives like crown vetch to stabilize roadsides.

The legislation will require PennDOT to compile a list of native vegetation based on the recommendations of the Pennsylvania Department of Agriculture's Controlled Plant and Noxious Weed Committee.

"This law delivers a plethora of ecological benefits across the state, reduces polluted runoff and adds more natural beauty for those traveling through the commonwealth," said Julia Krall, the Chesapeake Foundation's executive director for Pennsylvania.

A PennDOT spokesman said the agency had already begun moving away from planting nonnative species and, in 2023, updated its seed mixes and construction standards to remove nonnative species from projects around the state.

*— A. Crable*

# Despite progress, Anacostia River swim delayed again

## Weather, bacteria concerns prompt fourth cancellation

**By Whitney Pipkin**

After weeks of dry weather, rain is a good thing — unless you are planning an outdoor swim event in an urban waterway.

The Anacostia Riverkeeper has been trying to do just that for the past year. And a fourth attempt to schedule the first public swim in more than 50 years, this time for July 13, was called off due to concerns that heavy rain would wash pollution into the river and make swimming conditions unpleasant or unsafe.

"Unfortunately, they've had a string of rain events that have forced them to cancel," said Adam Lindquist who, as vice president of the Waterfront Partnership of Baltimore, recently organized a Baltimore Harbor Splash on June 23. "Until we get our stormwater under control, this is going to be the nature of swimming in any urban waterbody."

Lindquist said he wouldn't want anyone to get the perception that the Baltimore Harbor is demonstrably cleaner than the Anacostia. Both Baltimore and the District of Columbia have spent millions of dollars to curb the sewage overflows that have plagued the cities for decades. Still, many other factors have to align for a safe swim.

One key difference between Baltimore and the District is that swimming in the Anacostia has been legally banned since the early 1970s because of pollution. To host a public swim, the Anacostia Riverkeeper has to get permits and closely monitors water quality leading up to the event.

That first swim, planned for July 8, 2023, was rained out. Organizers were hopeful, though, that the more than $3 billion project to nearly end sewer overflows into the river would continue to make the river swimmable more often than not.

That has largely been the case. Quinn Molner, director of operations for the Anacostia Riverkeeper, said some locations in the river boast water quality that is safe enough for swimming 90% of the time.

Even after localities reduce the influx of untreated wastewater during rain, storms can still wash local pollutants such as pet waste and fertilizer into waterways, rendering them unsafe.

The next attempt at a public swim was scheduled for September 2023. Organizers hoped that, by then, another section of an underground stormwater tunnel would be in place. The tunnel stores polluted stormwater, preventing it from reaching the river, until it can be treated.

That happened, but then came hurricane-remnant rains, with winds driving them sideways in a way that "would have been unsafe and unpleasant for anyone in attendance," Molner said.

That was the end of the effort for 2023. The next attempt came in June.

June is often the best time of year to try for an outdoor swim like this, Lindquist said, because the first part of the month is often drier than the rest of the summer. That worked well for the Baltimore Splash, which welcomed more than 150 people into the water on a sunny Sunday in June.

A week after the Baltimore swim, the third attempt at an Anacostia Splash on June 29 was canceled due to concerning levels of *E. coli* in the water —a type of bacteria often found in fecal matter that can indicate the presence of other pathogens. Some strains can cause abdominal cramps, diarrhea, fever and vomiting.

Molner said initial lab tests showed the water was safe for a swim, but an unofficial test closer to the swim indicated it was "close to safe."

The District had permitted the event to proceed, she said, but the riverkeeper decided to cancel it "out of an abundance of caution." The swim was rescheduled for July 13.

But early in the week leading up to July 13, the remnants of Hurricane Beryl were expected to linger into the weekend, making a safe swim unlikely.

The riverkeeper has not yet announced a rescheduled date for the swim. Molner said she was encouraged that the Baltimore version had taken place meanwhile.

"Progress there is always a good sign for urban waterways," she said. ■

# Annual report card: Chesapeake Bay health gets a C-plus

## Estuary earns best grade in 21 years, but it's no better than what it earned for 2002

**By Timothy B. Wheeler**

The Chesapeake Bay's health ticked upward in 2023 to its best condition in more than 20 years, according to the latest annual report card from the University of Maryland Center for Environmental Science.

In a report card issued July 9, the university gave the Bay's overall health a C-plus for 2023, a half-letter grade improvement from the previous year's mark. It earned a 55% score, up four points from 2022.

How much real progress that represents is an open question. The university has only been issuing Bay report cards since 2006, but in looking back at water quality, habitat and underwater grass data for previous years, it found that the Bay's health received exactly the same score, a C-plus, in 2002.

This report card comes at a critical time, as the Bay restoration effort is falling short of key goals for the third time in 41 years.

State and federal officials hailed the latest report card as evidence that massive public investments to upgrade wastewater plants and control runoff from farms and development are making headway.

Adam Ortiz, mid-Atlantic regional administrator for the U.S. Environmental Protection Agency, called the report card "a strong indicator of progress," showing that the restoration effort is back on track and gaining ground. U.S. Sen. John Fetterman (D-PA) declared that the Susquehanna River, the Bay's largest tributary and a major source of its pollution, is "the cleanest it's been in two decades."

Environmentalists, while acknowledging that the C-plus grade is an improvement, stressed that much more needs to be done. Chesapeake Bay Foundation vice president Alison Prost said a report produced by a group of Bay scientists shows "there are approaches to Bay cleanup that could be more effective and efficient, and also help us optimize the use of resources."

The UMCES report card found modestly improved conditions since 2022 in 11 of the Chesapeake's 15 regions. The lower Bay scored highest at 70%, enough for a B grade, followed by the upper Bay. Heavily influenced by the Susquehanna, the upper Bay garnered its highest-ever score of 61%.

"This improvement is a testament to efforts to reduce nutrients in the Susquehanna River watershed," said UMCES vice president Bill Dennison, "underscoring the hard work in the state of Pennsylvania on nutrient reduction and riparian buffers."

At least some of the improvements, though, can be attributed to the weather: 2023 was a dry year, with river flows falling to record lows amid drought conditions. That reduced the amount of water-fouling pollution flushing into the Bay and its tributaries. By comparison, in 2019, a year or record rainfall, UMCES rated the Bay's health much lower, at 44%.

Despite weather-influenced oscillations, UMCES scientists say the Chesapeake's health has trended modestly upward since the restoration effort began in earnest in 1983. After earning a 55% score in 2002, nearly two decades into the cleanup effort, Dennison said that "the bottom dropped out" of the estuary's condition in a rainy 2003, including the deluge of a tropical storm that blew right up the Bay.

"The good news is that it's not going as low as it was," he added, "and it's steadily, slowly creeping up."

Even with less runoff in 2023, though, the overall condition of the rivers and streams flowing into the Bay showed no improvement from the previous year. Their overall 52% score and C grade remained unchanged.

The highest scoring tributary was the upper James River, which earned a B-minus, while the lowest was the Choptank River, which rated a D-plus.

Most Bay tributaries on the Eastern Shore showed at least some improvement from 2022, which UMCES said might be attributed to dry weather in 2023 causing less farm runoff. But rivers on the upper Eastern Shore are still trending slightly downward. With 40% of the peninsula's land devoted to farming, the report card suggested that controlling agricultural runoff is key to making real gains there. ■

# PA budget secures ongoing support for Chesapeake cleanup

## Legislation earmarks $50 million per year to combat pollution

**By Karl Blankenship**

Pennsylvania, long criticized for underinvesting in the Chesapeake Bay cleanup, plans to commit $50 million a year for programs primarily aimed at reducing nutrient pollution from farms.

The funding, in a budget signed by Democratic Gov. Josh Shapiro in July, represents the most significant support ever committed by the state to reduce harmful runoff to streams, particularly from agricultural lands.

Although Pennsylvania ramped up such funding in recent years, much of that came through federal Covid-relief money. The new budget ensures such funding will continue by permanently earmarking a portion of the state's revenue to support it.

"You have my commitment that this work will continue," Shapiro said at an July 9 event marking Bay cleanup progress. "Pennsylvania is all in."

Support was bipartisan with two Republican senators leading the push in the General Assembly — Scott Martin, chair of the Senate Appropriations Committee, and Gene Yaw, chair of the Senate Environmental Resources and Energy Committee.

"We have made tremendous progress in recent years to ensure our water is cleaner and healthier, and I am proud that our state budget makes historic new investments to ensure this progress can continue for many years to come," Martin said.

Yaw said the money "will go a long way toward restoring our local Pennsylvania streams and the continued improvement of downstream waters like the Chesapeake Bay. This is a historic investment, and I am grateful for the continued support of my fellow lawmakers and our governor in getting this across the finish line."

Martin and Yaw are members of the Chesapeake Bay Commission, an advisory panel that represents the legislatures of major Bay watershed states.

Almost $36 million of the funds are earmarked for the state's Agriculture Conservation Assistance Program, which helps farmers with runoff control practices.

Another $6 million is slated for the Clean Water Procurement Program, in which the state funds verifiable nutrient reduction efforts through a bidding process. Also, $5 million will support the Nutrient Management Fund, which helps farmers develop plans to guide manure and fertilizer use.

The remainder is divided among programs that target acid mine drainage, promote tree planting and help municipalities control stormwater.

Most of the programs operate statewide, so not all the money will be used in the Bay watershed.

Pennsylvania sends more water-fouling nutrients to the Bay than any other state. It has had difficulty reducing the nutrients nitrogen and phosphorus because the vast majority comes from farms and developed lands, sources that all the Bay states have struggled to control. The state began ramping up efforts in 2023, using about $154 million in Covid-relief funding.

The results are unclear. Bay Program computer modeling shows that efforts in Pennsylvania have accelerated. But, according to the models, the amount of nitrogen reaching the Bay from the Pennsylvania is similar to the amount in 2010. Water quality monitoring, though, shows a decrease. And the Chesapeake Bay and Watershed Report Card, released by the University of Maryland Center for Environmental Science in July, shows improvement in the upper Bay, which is heavily influenced by Pennsylvania.

Adam Ortiz, administer of the EPA's Mid-Atlantic region, said the state's efforts are paying off and praised the bipartisan support for clean water funding.

Ortiz noted that he stood alongside Shapiro, Republican legislative leaders and department secretaries from both Pennsylvania and Maryland at an event where the report card was released.

"That we stood together as a united front, already with results under our belt, is the most visual indicator of a change in trajectory anybody could possibly imagine," Ortiz said. ■

# Nansemond tribe aims to heal land, water at ancestral site

## Tribe steps up plans as it takes on formal stewardship of shoreline land

**By Lauren Hines-Acosta**

The 71 acres of the Nansemond Indian Nation's Mattanock Town near Suffolk, VA, can invoke something different for each visitor. Some people admire the woodlands by the Nansemond River. Chief Keith F. Anderson sees echoes of his ancestors' crops and villages. People working to restore the land point to many years of damage. But, like Anderson, they envision the land's potential.

The Nansemond nation has been working on environmental restoration projects for this piece of ancestral land for over a decade under a special agreement with the city of Suffolk. In July, when the city transferred the deed to the tribe, the Nansemond became its official steward. Now, larger efforts are underway to improve water quality and reconnect Native citizens to the land.

"We know we need clean water, air and land to survive," Anderson said. "It's an honored stewardship that we have ingrained in our minds and souls and also to honor our ancestors, who did that for thousands of years."

With more than a mile of shoreline and about 21 acres of tidal wetlands, the land is important to the Nansemond because it provides access to their namesake river. The tribe named it Mattanock Town after a nearby ancestral settlement, although there is no town at the site.

Ancestors of the contemporary Nansemond have been around the river and surrounding land for at least 12,000 years, when the Paleo-Indian period began.

In the 1600s, the Nansemond and the British colonists were engaged in a series of wars. They eventually signed the Treaty of Middle Plantation in 1677. As settlers continued moving into the Nansemond River area in the 1700s, the Nansemond were increasingly separated from their land and the treaty became void after colonists rejected British rule. Much later, the 1924 Virginia Racial Integrity Act worked to further obscure their identity.

When the Nansemond people won federal recognition in 2018, they also gained capacity to manage land and take on bigger projects to improve and protect both land and water.

And the Nansemond River needs help. The Nansemond River Preservation Alliance, a local nonprofit, released a report in May that classified the river as impaired. According to the report, phosphate levels

*Students with the Virginia Tech chapter of the American Indian Science and Engineering Society plant an eastern red cedar at the Nansemond Indian Nation's Mattanock Town in March 2024. From left to right are Paninnguaq Boassen, Bryce Burrell and Nansemond citizen Irma Adams. (Nikki Bass/Nansemond Indian Nation)*

are 3.5 times higher than the recommended threshold. Plus, oxygen levels have been declining throughout the river for the past six years.

Beth Cross, president of the alliance, said that human impacts have taken a toll. More than 50 years ago, parts of the river were dammed to provide other cities with water. That makes the water stagnant, without enough current to flush out contaminates from stormwater runoff.

Cross pointed out that the Nansemond nation is literally in a good position — halfway up the river — to help improve water quality.

The land at Mattanock Town needs attention too. Beginning in 1926, the Lone Star Cement Corporation operated 11 mine soil pits that ran from the river inland for about 2.5 miles. The U.S. Environmental Protection Agency shut down the company in 1971. Two of the 11 pits that were within Mattanock Town were left to sit. As vegetation grew around them, invasive plants moved in. Water quality suffered, and the connection between the forest and marshes was fractured.

Cameron Bruce, the environmental program manager with the Nansemond nation, said they finished the first round of invasive plant removal last September. The Virginia

*Nikki Bass, a Nansemond Indian Nation councilmember, holds oysters after cleaning out oyster cages in the spring of 2023. (Keith F. Anderson/ Nansemond Indian Nation)*

Department of Forestry, Chesapeake Bay Foundation and volunteers from the nation planted 450 native trees like witch hazel and hackberry in March. Anderson said the trees are "doing phenomenal."

Bruce also said their oyster garden is far along after four years of collaborating with the Bay Foundation. Overharvesting, pollution and disease contributed to the collapse of the oyster population in the river by the 1980s, reaching less than 10% of historic levels. Because oysters are filter feeders, their restoration will help improve water quality.

Each year, the Bay Foundation gives the tribe baby oysters, or "spat on shell," to grow. Then, the tribe plants the adult oysters on a sanctuary reef owned by the Nansemond River Preservation Alliance in Chuckatuck Creek, a few miles upstream from Mattanock Town.

Bruce said having full jurisdiction of the land opened the door for the tribe and its partners to tackle bigger restoration projects there.

The Suffolk City Council voted 7–0 with one abstention on May 15 to transfer the land to the Nansemond nation. A conservation easement will protect the land from development. And the tribe agreed to provide public access to the site, providing a new outdoor resource for the community.

"We want to be able to have community kayaking and canoeing down that area to actually provide [opportunities to people] who really may be new to outdoor recreation, and also to spur some life on the Nansemond River and Cedar Creek, and especially to kind of give the feel or vibe of how it would have been a thousand years ago," Anderson said.

Now that the tribe is resuming its role as steward of the land, it can start the heavy lifting. The biggest project will be creating small and large "living shorelines" that provide habitat and protection from erosion, along with planting streamside trees. Both will help filter runoff as it flows toward the river.

"There's a lot of work to do, and so we would like to transform [Mattanock Town] from how it currently is left over from Lone Star [Cement] into … a case study for how land can be restored from really poor conditions into something beautiful," Bruce said.

Bruce and Anderson would like to create a tribally owned oyster hatchery in the river and an educational walking trail. They also want to host demonstrations that show how the Nansemond have lived in connection and reciprocity with nature for thousands of years.

For now, they're focused on securing more funds for the living shorelines and removing dead trees this summer. They hope to open trails by 2025. ■

# Chesapeake Bay underwater grasses rebound for third year

## Scientists cheered by the recent expansion of eelgrass in high salinity areas

**By Karl Blankenship**

*Scientists are keeping a close watch on eelgrass, which is sensivitve to high temperatures. (Dave Harp)*

Underwater grass beds in the Chesapeake Bay region expanded for the third consecutive year in 2023, reaching their seventh highest level observed in four decades of monitoring.

The news was especially good in high salinity areas of the lower Bay, where underwater meadows — a critical habitat for many species — covered a greater area than had been observed in a quarter century.

The survey also found that Bay grasses greatly expanded in moderately saline areas of the middle Bay and generally remained stable in low salinity areas.

Overall, data from the annual aerial survey conducted by the Virginia Institute of Marine Science showed a 7% increase in the Bay and its tidal tributaries over 2022, with grass beds covering an estimated 82,937 acres.

That was less than the recent high of roughly 108,000 acres in 2018 but more than double the 38,228 acres observed in 1983 when the survey began.

Submerged aquatic vegetation, or SAV, provides an important refuge for juvenile blue crabs and fish, as well as food for waterfowl. Plus, they pump oxygen into the water, their roots help stabilize sediment, and their leaves buffer wave action.

They are also a closely watched indicator of Bay health because the plants require clear water to get the sunlight needed to survive. They die off when sediment and nutrient-fueled algae blooms cloud the water.

That happened most recently in late 2018 and early 2019, when protracted rain flooded the Bay with nutrients and sediment, leading to a 42% loss.

Because underwater grasses are so important, Bay cleanup goals are aimed in part at creating conditions that would allow 185,000 acres of grasses to return.

Chris Patrick, a VIMS scientist who oversees the survey, said the best news for 2023 was in the high salinity area, or polyhaline zone, of the lower Bay, which saw its fourth consecutive year of increase.

The estimated 21,743 acres observed there was an increase of 11% over 2022 and the greatest amount since 22,678 acres were counted in 1997. The restoration goal for the polyhaline, which stretches from the Rappahannock River and Tangier Island to the mouth of the Bay, is 33,647 acres.

"We're seeing grass where we've never seen grass before," Patrick said. "It's growing very deep, and it's growing very far out from shore."

Mobjack Bay, a vital habitat area between the York and Rappahannock rivers, had more grass in 2023 than in the history of the survey, with about 12,000 acres.

Patrick and other scientists have been worried about the polyhaline because it is dominated by eelgrass, a species that is sensitive to high temperatures. Eelgrass has had ups and downs from year to year, but the overall trend has been downward since the late 1990s, as Bay waters warm.

Patrick said several factors seem to be helping the rebound.

Water has been clearer in recent years, allowing the plants to get more sunlight and move into deeper, cooler areas. Patrick has seen eelgrass growing in water more than 9 feet deep at low tide in places a mile from shore. In recent decades, eelgrass was largely confined to shallow nearshore areas that are more susceptible to warming.

Patrick said warmer winters have also lengthened the eelgrass growing season, with plants producing seeds weeks earlier than they had a few decades ago.

Patrick cautioned that warmer summer temperatures are still likely to greatly diminish eelgrass in future decades, but the near-term outlook may be brighter than scientists expected.

That's good news because eelgrass is often considered the Bay's most ecologically important SAV species. It's the only species found in most high salinity areas, where it is especially valuable shelter for juvenile blue crabs returning to the Bay from the ocean.

Unlike many aquatic grasses that die back during the winter, eelgrass provides food and shelter nearly year-round.

### Middle Bay

The moderately salty mesohaline zone saw an increase of about 21%, with 37,961 acres. The mesohaline stretches southward from near Baltimore to the Rappahannock River and Tangier Island in Virginia, and it includes large sections of most tidal rivers.

The grass beds in Tangier Sound saw significant expansion, covering about 13,300 acres, replacing Susquehanna Flats in the upper Bay as the Chesapeake's largest grass bed.

The mesohaline in recent decades has been dominated by widgeon grass, a species notorious for boom-and-bust cycles, rapidly expanding when water quality is good but disappearing quickly when it turns poor.

That was seen most recently in 2018, when the mesohaline reached about 63,000 acres — the highest amount seen in that area since the survey began. But half of that was lost the next year after high river flows flooded the Bay with nutrients and sediment.

Brooke Landry, a biologist with the Maryland Department of Natural Resources and chair of the Bay Program's SAV Workgroup, said that another species, sago pondweed, has started to move into portions of the mesohaline. It is less prone to dramatic fluctuations and could help stabilize grass beds in that area.

"We don't know exactly why it's taking over some areas," Landry said, "but it's been doing really well the last five or so years."

That would be especially beneficial as the mesohaline has, by far, the most potential habitat in the Bay — roughly 120,306 acres.

### Upper Bay & tidal rivers

The slightly salty oligohaline zone, which covers a relatively small portion of the upper Bay and tidal tributaries, saw a 54% decrease last year, dropping to 3,429 acres. Patrick said much of the decline was in and near the Gunpowder and Middle rivers in Maryland and may have been driven by localized factors. There was also a substantial decline in the middle Potomac River.

The oligohaline area has the least amount of potential underwater grass habitat, with 10,334 acres.

### Head of Bay & freshwater rivers

The tidal freshwaters at the head of the Bay and in the uppermost reaches of tidal tributaries had an increase of about 2%, with 19,804 acres. That area hosts more than a dozen grass species, helping to stabilize its beds. Acreage has been mostly steady for the last few years.

Grasses cover about 93% of roughly 20,600 acres of potential habitat in tidal freshwater areas. More than half of that acreage is in the Susquehanna Flats, near the mouth of the Bay's largest tributary. ■

# More osprey reproduction problems found around the Bay

## Fishery managers debate 'precautionary' closure of Chesapeake menhaden harvest

**By Timothy B. Wheeler**

Perched on a nest atop a green navigation marker in Maryland's Harris Creek, the osprey glared, spread its wings and started hopping as a boatload of people drew near.

"That's a pretty big nestling standing up," observed Barnett Rattner, a veteran scientist with the U.S. Geological Survey's Eastern Ecological Science Center. "Last week, there were two."

Peering at the agitated fish hawk through binoculars, Rattner spied the telltale reddish-orange eyes of a juvenile, so the boat halted its approach. They didn't want to spook the youngster into trying to fly before it was able. It would almost certainly fall in the water and drown — perhaps the fate of its missing nestmate.

Rattner and USGS wildlife biologist Dan Day have been visiting osprey nests around Tilghman Island on Maryland's Eastern Shore every 7 to 10 days since early spring. They're part of a multi-pronged effort to assess the birds' breeding success around the Chesapeake Bay following a troubling report last year of a drastic reproduction decline in Virginia's Mobjack Bay.

This year, researchers have been monitoring more than 600 breeding pairs of osprey in a dozen locations to see if the problem is happening elsewhere. They have been checking nests in 10 areas along both shores of the Chesapeake where menhaden, a favorite prey of ospreys, usually can be found. They're also looking in two freshwater locations on Bay rivers where osprey rely on different fish for food.

The Chesapeake boasts the world's largest breeding population of ospreys, estimated at 10,000 to 11,000 pairs. They have staged a remarkable comeback since the 1970s, when contamination from the pesticide DDT, ingested by ospreys from the fish they ate, devastated their ability to produce offspring. The federal government banned DDT in 1972.

While toxic chemicals still exist in the environment, the overall population of Bay ospreys continues to grow. But now, scientists are exploring a new potential threat: a lack of fish for ospreys to eat.

### Food shortage linked

In a paper published in April 2023, scientists with the Center for Conservation Biology at the College of William & Mary reported seeing a steep decline in osprey reproduction in Virginia's Mobjack Bay, which lies between the Rappahannock and York rivers. They linked the breeding woes — even worse than in the DDT era — to a shortage of food, particularly Atlantic menhaden, a migratory fish that is the birds' dietary staple there.

*Perched on a wooden platform built to encourage nesting, a female osprey guards two chicks. In the upper right, a camera helps researchers learn which types of fish the adult birds bring to their young. (Dave Harp)*

That finding has turned up the heat on a long-running controversy. Recreational anglers and conservationists have complained for years that large commercial harvests of menhaden near the mouth of the Bay in Virginia are harming other fish, especially Atlantic striped bass, which rely upon menhaden for food. That fleet works for Omega Protein, which processes the menhaden at a plant in Reedville into animal feed and nutritional supplements.

The complaint has gone nowhere, in part because data are lacking on how abundant or scarce menhaden are in the Bay. Now, though, the report of nest failures in Mobjack Bay has given advocates fresh ammunition to press for a clampdown on the Chesapeake menhaden harvest. Following an Aug. 6 briefing by USGS scientists about osprey reproduction issues, the Atlantic States Marine Fisheries Commission, which regulates the menhaden catch along the East Coast, voted to study whether to impose seasonal closures of large-scale harvests of the fish in the Bay.

*A mirror attached to a pole reveals a pair of young ospreys hunkered down in a nest of branches on a wooden platform. (Dave Harp)*

What the USGS scientists have seen so far in mid-Bay Maryland is similar to what the researchers reported in Virginia. Ospreys occupied only a little more than half of the 90 platforms, navigational markers and other available nesting sites where the two USGS scientists saw ospreys in their study area, which stretches from lower Broad Creek into Harris Creek and then around the western side of Tilghman Island.

The vast majority of those ospreys that did nest failed to produce or maintain young. By mid-July, there were many more empty nests than those that had even a single chick, much less two or three. Cruising down Harris Creek, Rattner pointed to one loss after another: "That one had eggs in it. It failed. That one never got started."

During his 47-year career with the USGS, Rattner has studied ospreys in several Maryland and Virginia rivers of the Chesapeake, as well as in Delaware Bay. As an ecotoxicologist, he was researching whether pesticides and other toxic chemicals in fish might be affecting the birds' reproduction or survival. The good news is that, while there are still some areas of concern, contaminants are decreasing and don't appear to be affecting the overall osprey population in the Bay watershed.

But Rattner said the rate of successful breeding he and Day have seen in their Eastern Shore study area this year is far below what he saw 10 to 20 years ago.

### Multiple reasons for failure

"All kinds of things happen to nests," Rattner pointed out. Crows may feed on eggs if a nest is left unguarded even briefly. Great horned owls and bald eagles snatch chicks. Storms can blow nests off platforms. Diseases take a toll, as does the relentless summer heat. And some osprey pairs build a nest but don't produce eggs.

On a scorching day in mid-July, female ospreys were perched on some nests, wings


*U.S. Geological Survey scientist Barnett Rattner peeks into an osprey nest atop a navigation marker. (Dave Harp)*


*Ospreys often build nests on navigation markers in the water. The females guard the nest while there are eggs or young present but circle overhead when people get too close. (Dave Harp)*

outstretched in a few cases to shield the young beneath from the broiling sun. The males usually hunt for fish while the females stay on the nest.

To see if food availability might be a factor, Rattner and Day have mounted battery-operated cameras in four nests to monitor the number and type of fish the adults bring back to the nest. In one photo sequence, a male osprey delivered a juvenile striped bass for two chicks to consume.

There have been glitches with the cameras, though. The scientists have had to replace batteries and make other adjustments, including shifting at least one camera from a failed nest to one with eggs or chicks.

One year's fieldwork is just a snapshot, of course. Rattner said that more research is needed to identify trends and fill data gaps.

And the apparent surge in nest failures does not mean the Chesapeake osprey population is in imminent danger of collapsing, said Bryan Watts, director of the Center for Conservation Biology. Ospreys upriver in the Bay watershed are still producing plenty of offspring, and the overall population continues to grow.

"This is a long-lived species," Watts said. "With lifespans averaging 15 to 20 years, they can withstand a dip in reproduction."

But because ospreys subsist almost exclusively on fish, he said, they are a good indicator of fish abundance. That's the main reason for the nest surveys, he added.

To date, Mobjack Bay is the only place with direct scientific evidence that menhaden — or their apparent scarcity — influenced osprey reproduction. There, scientists conducted a controlled experiment, feeding some newly hatched birds an extra ration of menhaden and comparing their better growth and survival with those subsisting on what could be caught in the wild.

Watts suggested that high rates of nest failure seen in the areas where menhaden are usually abundant provide circumstantial evidence that food availability played a role.

## Sign of food stress

"A high proportion of failures after hatching and a larger proportion of one-chick broods is a clear sign of food stress," he said. For example, along Maryland's Patuxent River, one of the areas Watts monitored this year, almost 60% of osprey pairs that successfully reproduced had one-chick broods.

Greg Kearns, a naturalist with the Maryland National Capital Park and Planning Commission who's been banding and monitoring ospreys on the Patuxent for 40 years, said he'd seen a significant drop this year in nesting attempts.

And by early July, Kearns said he'd seen a lot of failed nests, particularly along the lower river, where menhaden ordinarily make up the bulk of the ospreys' diet.

There was something off about this nesting season almost from the beginning, Watts said. Ospreys returned to the Bay as usual in late February and early March after wintering in South America and the Caribbean. But many didn't lay eggs in early spring or at all, he said. And many of the eggs laid in late spring either didn't hatch or the chicks didn't survive as summer temperatures climbed into the 90s.

"I think that the birds were squeezed with low food availability," he said, "then ran into the heat wave."

There were anecdotal reports that the schools of menhaden that return to the Bay every spring after wintering off the mid-Atlantic coast didn't show up on time or at all this year. Some have suggested the Bay's unusually low salinity the first half of the year after a wet winter and spring may have deterred them.

Of course, there may also be other factors affecting ospreys' reproduction. Pete McGowan, a biologist with the U.S. Fish and Wildlife Service, said he suspects that nest predation has been a big factor in a near total failure of ospreys to produce young on Poplar Island, which is in the middle of the Bay about a mile west of Tilghman Island in Maryland. Only three nests out of 25 begun in the spring are still active, he said, with just one chick in each.

Poplar Island is not one of the 12 sites Watts and colleagues have been monitoring, but Watts suggested that at least some of those nest failures could still be an indirect result of food stress. If the male osprey doesn't bring enough fish, the female may leave the nest unguarded to search herself, leaving it open to predators.

## Fishery study delayed

So far, fisheries managers are unconvinced there's a problem with menhaden. A 2022 stock assessment concluded that the coast-wide population is not being overharvested. The Atlantic States commission, which oversees near-shore fisheries from Maine to Florida, has for several years maintained a cap on commercial menhaden harvest in the Chesapeake. Conservationists and angler groups contend that the cap is too loose, allowing the Virginia-based fishing fleet to deplete the stock there.

There's been no study, though, to settle that dispute. In 2023, Virginia lawmakers commissioned a plan for such a study but this year chose to wait until 2025 to decide whether to do it. Meanwhile, the Virginia Marine Resources Commission has rejected petitions seeking a moratorium in Bay waters of the type of purse-seine harvesting performed by Omega's fleet. Angler groups have gone to court seeking to force a cutback.

At its Aug. 6 meeting, the Atlantic States commission's menhaden board rejected a motion by Lynn Fegley, fisheries director for Maryland's Department of Natural Resources, to begin the process to authorize seasonal closures of large-scale menhaden harvests in the Chesapeake.

With commission members divided on the issue, the board instead unanimously approved forming a workgroup to evaluate options for "precautionary" management of menhaden in the Bay, including seasonal harvest closures. The group is to make at least a preliminary report when it meets in October. ■

# PA forests plan includes new uses, more trails, more logging

## Forestry bureau updates blueprint for state-owned and private woodlands

**By Ad Crable**

It's been 30 years since the largest landowner in Pennsylvania — the state itself — came up with a strategic plan to guide the use of its 2.2 million acres of forest, along with 12 million privately owned acres.

The Pennsylvania Bureau of Forestry's list of challenges has evolved in those three decades, now including climate change, invasive plants, diseases and destructive insects. New recreational uses have also come to the fore, such as mountain biking, forest bathing, e-bikes and all-terrain vehicles — not to mention an inundation of visitors during and since the COVID-19 pandemic.

Time for a new blueprint.

After several years of public opinion polling and surveying the many stakeholders of state forests, the bureau has drafted a new plan called *Forests for All: A Plan for Pennsylvania's Forests and People.* The aim is to keep forests and their native flora resilient while inviting more people to enjoy them for physical and mental well-being.

"We needed to bring to the front that we need to manage for people. Demographics change. What they value. How they want to connect with the forests," said state forester Seth Cassell.

In Pennsylvania, trees are a big deal. Forests are among the state's most identifiable characteristics and nurture a sense of place. Sixty percent of the state is forested, and it's the top timber-producing state. It's the only state that has forests as part of its name, which means Penn's Woods.

One new focus under the proposed plan is to put forests, or at least trees, within better reach of both urban and rural residents. This stems from a conviction that being around trees and plants is good for both physical and mental health.

"We want people to be inspired. You can be inspired by urban trees or seeing trees off in the distance," Cassell said. "We want trees and green spaces in our communities. We want to bring the resource closer to you and closer to home. Maybe it's a corner of people's yards for pollinators or wildlife habitat. Or community green space. We will advocate [to local officials] for more trees and native plants in your communities."

Cassell said part of the initiative stems from a realization that many communities with residents of color have gotten short shrift when it comes to replacing trees cleared for development. The resulting treeless, shadeless communities become what are known as "heat islands" in the summer.

*Pennsylvania's new forest management plan takes into account the public's growing desire to be in and around forests. (PA Dept. of Conservation and Natural Resources)*

The plan also forecasts expansions of the several-thousand-mile trail system in state forests, with new trails and better connections between trails and between trails and communities.

Democratic Gov. Josh Shapiro's new state budget funds 22 new trail maintenance positions. More rangers will be hired to ensure public safety on trails, educate visitors about their surroundings and enforce regulations.

Pennsylvania is growing its recreation-based tourism economy, and the Bureau of Forestry promises to do its part. In recent years, the bureau and its parent agency, the Department of Conservation and Natural Resources, have been supporting more diverse forms of recreation. While hunting, fishing, hiking, mountain biking and equestrian use remain staples, it took an act of the legislature to force an expansion of trails and forest roads for all-terrain vehicles.

"It's about balance," Cassell said. "We have wild and natural areas, old-growth forests, limited-management areas."

State forests, he emphasized, will continue to offer plenty of backwoods hiking where the landscape's wild character is preserved.

Don't expect cutbacks in logging, long seen as a desirable use of state forests. Currently, about 15,000 acres of state land are harvested for timber annually.

*Pennsylvania's Grand Canyon is surrounded by state forest. (Ad Crable)*

That, Cassell said, should be a source of pride for Pennsylvanians. Not only do state forests provide necessary wood products and spur the state economy, but sustainable timbering improves the health of forests the bureau is required to maintain, he said. Selectively cutting trees provides for a desirable diversity in forest ages and types, as well as wildlife habitat, according to Cassell. Competition among tree species can be managed by timbering.

"We would have to pay people to do this management if we didn't have a forest products economy," he noted. "We need a healthy forest products economy to have healthy forests."

When fracking for natural gas in Marcellus Shale swept through parts of the state around 2008, DCNR initially leased mineral rights on and under its land, earning more than $1 billion dollars in revenue for itself and general state funds. In 2016, then-Gov. Tom Wolf placed a moratorium on gas leases on state forestland, citing a need for "environmental balance."

Cassell said fracking infrastructure, whether it's the well pads, access roads or pipelines, presents a fragmentation problem in state forests. "We do our best to minimize the impacts," he said, citing best-management practices for gas production areas.

He noted that working cooperatively with the oil, gas and mineral industries has helped with removing invasive plants and reclaiming retired energy infrastructure.

Natural gas infrastructure, as well as transportation and utility rights of way, will continue to be permitted. "People want to have electricity come to their house or cabin. We have to move energy across the country," Cassell said.

Known and potential migration corridors in state forests will be protected for wildlife, including those on the move because of changing climate conditions.

One goal is to conserve, protect or buy 250,000 acres of forestland across the state, partly to increase acreage that can store carbon and mitigate the effects of climate change.

The bureau will also work to maintain forest health and resiliency in the face of invasive plants, diseases, insects and climate change. But Cassell notes that "there have not been many successful eradication efforts. These health issues are going to persist in the near future for sure."

The plan calls for greater effort to reforest abandoned mine lands, closed natural gas drilling sites, unproductive agriculture lands and degraded private forests.

The state will continue to prioritize planting streamside forest buffers, as well as using prescribed fires to improve habitat for native plants and reduce the ever-present danger of wildfires.

Buttressing all these moving parts, Cassell said, is a clear and growing desire among citizens to be in and around forests.

"We want people to enjoy our forests," he said. "We want people to be connected to them. It's one thing that brings everybody together." ■

# Researchers aim to help solar farms reduce erosion, runoff

## Long-term study looks at site variables and best practices

**By Whitney Pipkin**

Landscapes lined with solar panels don't absorb rainwater the same way that a forest does — or shed it like a parking lot. But researchers are just beginning to understand the factors that can greatly reduce the negative impacts of utility-scale solar installations on soil and water.

Virginia Tech University recently released a white paper detailing the known best practices for reducing soil erosion and runoff at solar farms. The paper, which has not yet been peer-reviewed, is the first to emerge from a six-year, $6 million study now underway at the university. The research, funded by the Virginia Department of Environmental Quality, will continue through 2029.

The effort aims to answer a key question, especially for Virginia regulators: When it comes to stormwater runoff, should solar panel sites be considered impervious (like a roof or parking lot), pervious (like a grassy field) or something in between (often called "disconnected impervious")?

The answer is particularly germane as a new Virginia law goes into effect this summer that requires solar installations to offset some of their harmful impacts.

Passed in 2022, house bill 206 targets renewable energy projects that would have a "significant adverse impact on natural resources" — namely, any project that disturbs more than 10 acres of "prime" agricultural soil, more than 50 acres of contiguous forests or forests enrolled in preservation programs.

The law generated significant debate. Ultimately, the Virginia Conservation Network, which represents dozens of environmental groups, supported it.

The legislation required DEQ to provide ways to avoid, minimize or mitigate damage to these types of landscapes, with a focus on changes that could be made during the construction phase.

Virginia already has laws on the books that require solar installations to comply with stormwater regulations. But DEQ director Mike Rolband said in 2023 that nearly 70% of the 77 large solar installations his agency was overseeing at the time (many smaller projects are regulated by localities) had "significant" noncompliance issues. About 30% had pending violations or consent orders — agreements that dictate how a site must get back into compliance.

*Moving and grading soil during the construction of solar energy sites can lead to erosion and increased stormwater runoff. (landrehab.org/solar-farms)*

These violations often arise when, for example, rolling terrain that supported pastures is stripped down to the underlying dirt. This might make it easier to install solar panels, but, if grass or other vegetation isn't planted immediately, the loose soil can quickly wash away in storms. Heavy machinery can also do long-term damage by compacting the formerly arable soil.

"What we're seeing on the ground [are] huge problems, due mostly to lack of any vegetation," Rolband said during a 2023 workshop held by the Scientific and Technical Advisory Committee of the Chesapeake Bay Program, the state-federal partnership that leads the Bay restoration effort.

Even as existing facilities struggle to comply with stormwater regulations, swaths of the Mid-Atlantic region continue to be converted into utility-scale solar facilities.

W. Lee Daniels, a professor in Virginia Tech's School of Plant & Environmental Sciences and one of the authors of the white paper, notes that more than a quarter-million acres of either forested or agricultural land are going to be converted to support solar panels in Virginia in the next 20 years.

*Post-construction efforts to seed the land at this Virginia solar farm, shown here in midwinter, enjoyed relative success. The work also met the state's minimum standards for erosion and sediment control. (landrehab.org/solar-farms)*

Others have estimated a higher amount, but the number is difficult to confirm because of the rapid improvement of technology.

"This is going to be the major land use transformation in rural areas," Daniels said.

Similar to other types of land use, not every solar installation is the same. Some do not significantly reshape the land and disturb less than 10% of the existing soil during construction. But heavy grading can compromise as much as 75% of a site by removing or compacting topsoil, the researchers found.

"There's almost nothing published with data of stormwater runoff on solar sites — actual data on sediment losses and actual measurements of changes in soil quality," Daniels said. "This whole area is so new, and we're only a few years into these large sites being built and made operational."

But he said it's possible to vastly reduce the industry's impact on soil and water quality by using best practices borrowed from decades of research in other fields. In Virginia, for example, research in mine land reclamation and highway corridor re-vegetation has shown how to grow grass quickly, even in mostly clay soil on steep slopes.

Often, a solar installation leasing land for 20 or 30 years will promote the ability to eventually return the land to agriculture or another original use afterward. But, so far, research has shown that may not be the case if certain practices are not followed.

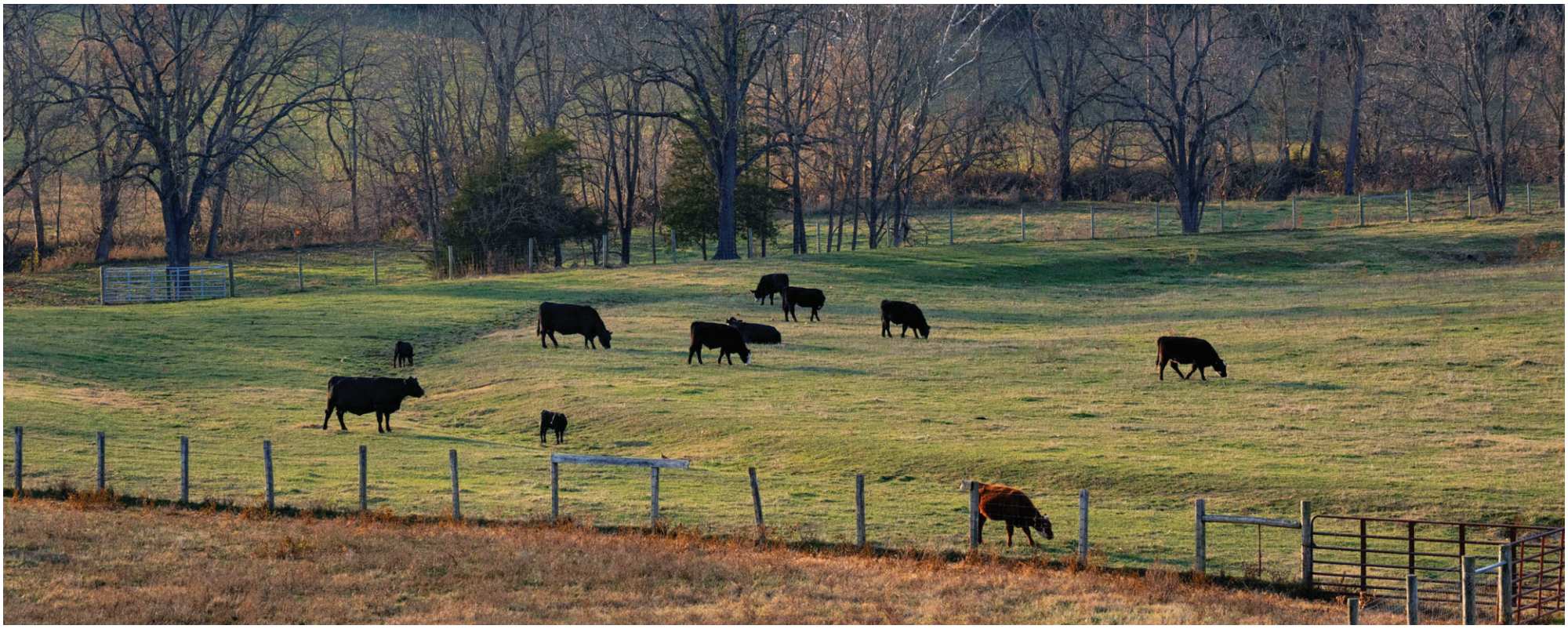
If prime farmland is graded so that the topsoil is moved around and compacted, "we know how to get that into productivity again, but it's not realistic to think it's ever going to be 100% of what it used to be," Daniels said.

Some in the solar industry may disagree or argue that best management practices come at a cost that would make renewable energy less feasible.

But the white paper points out that heavy grading is still largely avoidable with changes to popular construction practices. There are, for example, ways to work with the natural contours of the land while still placing the panels in optimal positions for sunlight.

DEQ gave an award this year to Nevados, a company that created mounts allowing solar panels to be situated in harmony with the contours of the land. In the future, sensors could be added to help panels move in response to the weather and reduce runoff during storms.

"We know how to minimize soil disturbance and revegetate sites," Daniels said. "The basis of our paper is applying what we know how to do to this relatively new industry." ■



# Smith Creek shows complexity of reducing ag pollution

Ag & the Bay
Sowing a Conversation

**Editor's Note:** State and federal leaders have acknowledged that the Chesapeake Bay region will not meet its most fundamental 2025 cleanup goal: reducing nutrient pollution in the Bay and its rivers. Now, many people are asking, "How did we get here?" and "What's next?" This article is part of an ongoing series that tackles that question.

For 40 years, the Bay region has struggled to sufficiently reduce nutrient pollution from farms. The reasons are complex. But it's important to explore those challenges as the region engages in a tough conversation about the future of the Bay restoration effort.

Previous articles in this series discuss difficult trade-offs with agriculture, the challenge of setting realistic goals, the dearth of technical support for farm conservation projects, concerns about the ag data used in Bay computer models and more.

*You can find them at bayjournal.com*

**By Karl Blankenship**

The rural roads of eastern Rockingham County wind over hills, through wooded patches, along fields and cattle farms, all flanked by the forested wall of Massanutten Mountain to the east.

Cory Guilliams, who's been driving these roads for nearly two decades, knows every twist and turn.

"The second channel over this is Dry Fork," Guilliams said as his white U.S. Department of Agriculture SUV rose over a hill. "And it's likely going to live up to its name. There'll be some puddles here and there."

Moments later he was proven right. There was Dry Fork — dry — with a few scattered puddles, several covered with algae.

Guilliams is the district conservationist for the USDA's Natural Resources Conservation Service office in Harrisonburg, VA. Its staff works with farmers to improve conservation management of their land, which hopefully will lead to less algae in Dry Fork as well as downstream waters — Smith Creek, the North Fork of the Shenandoah River and, ultimately, the Chesapeake Bay.

It's a tall order. Rockingham County, dubbed the turkey capital of the world, is Virginia's most agriculturally intensive county. Farming has been the pillar of the local economy since the early 1700s.

Last year, its farmers produced an estimated 6.7 million turkeys and about 113 million broiler chickens, while raising 80,000 cattle and 28,000 dairy cows, as well as horses, goats and other animals.

That concentration of animals helps make the upper Shenandoah Valley, along with southcentral Pennsylvania and the Bay's Eastern Shore, one of the "hot spots" for agricultural nutrient pollution — in other words, manure.

One of Guilliams' tasks since 2010 has been boosting work in the county's Smith Creek watershed. The USDA selected it as a "showcase" site to demonstrate how ramped-up farm conservation actions could help improve water quality.

Farmers there have stepped up to the challenge, and the number of conservation practices has grown dramatically — yet nutrient pollution has increased, not decreased.

Guilliams acknowledges the problems. Many pastures are overgrazed. Too many cows still have access to streams. There is often more manure applied to crops than needed. And just about every day, trains bring Midwest grain to feed animals, much of which will become more manure.

These problems took decades to develop, Guilliams observed, and undoing them will take decades, too. "We get attention deficit disorder," he said. "It's going to take a generation or two of focused effort to get things done."

Recent efforts have led to small successes, he noted. The health of some streams, as measured by aquatic insect diversity, is improving.

Overall, though, the Smith Creek project illustrates the dilemma facing much of the Bay watershed: Efforts to reduce runoff from the region's 83,000 farms face stiff headwinds as those operations increase production to meet market demands and try to maintain profitability as costs rise.

As a result, computer models used by the state-federal Bay Program partnership indicate that since 2010, when the latest Bay cleanup plan went into effect, nutrient runoff from agriculture regionwide has decreased only slightly.

The slow progress has sparked debate within the Bay effort because agriculture is the largest source of water-fouling nutrients reaching the Chesapeake. The region is counting on farmers to make more than 90% of the future nutrient reductions needed to meet Bay water quality goals.

With the upcoming 2025 Bay cleanup deadline certain to be missed — as were deadlines set for 2000 and 2010 — the

*Top photo: Raising cattle is a major farming activity along Smith Creek in Virginia, but much of the land is overgrazed. (Dave Harp)*

region is struggling with how to address the dilemma. Some agree that addressing farm runoff will be a decades-long task and that efforts moving forward should emphasize actions that benefit streams.

Others want the region to more aggressively address agricultural runoff. They question whether the types of voluntary programs that the Smith Creek effort are built upon could ever deliver the level of water quality improvements needed to meet Bay goals.

Measures to control nutrient-laden runoff can be costly for farmers, many of whom are financially stressed. But nutrient pollution — in the forms of nitrogen and phosphorus — spurs algae blooms that contribute to oxygen-starved "dead zones." And it can pose health risks and financial burdens to others downstream.

In July, for instance, the Virginia Department of Health issued an Algal Mat Alert for part of the North Fork of the Shenandoah River, something that has happened often in recent years. It warned that the mat could contain toxins harmful to pets, livestock and people.

"Lots of businesses, mom and pop businesses, from Airbnbs to outfitters to campgrounds, all rely on a clean, healthy river," said Mark Frondorf, the Shenandoah Riverkeeper.

## Showcase watersheds

The Showcase Watersheds program was launched in 2010 as the U.S. Environmental Protection Agency was pressing to develop a new, more regulatory Bay cleanup plan — one that in theory would press states to more aggressively seek nutrient reductions from agriculture.

President Obama the previous year had pledged "a new era of federal leadership" on the Bay. The Farm Bill was pumping unprecedented amounts of funding into the region, and the USDA wanted to show that it would make a difference.

It identified three watersheds where actions would be accelerated. The U.S. Geological Survey would monitor water quality to show results.

Along with the Smith Creek watershed, the effort included the Upper Chester River watershed in Maryland and Delaware and the Conewago Creek watershed in Pennsylvania.

Of those, the Smith Creek watershed is the largest, at 106 square miles, and has the longest-running monitoring data. Nutrient monitoring there started in 1985.

Smith Creek, which is mostly in Rockingham County but also drains part of Shenandoah County, was selected in part because almost a quarter of the 64 miles of streams in its watershed were listed as impaired. The state had recently drafted a cleanup plan to address those problems, and related meetings had drawn many interested farmers.

*U.S. Geological Survey monitoring in places like this stretch of Smith Creek shows that, since 1985, the amount of nitrogen exported from the creek and its tributaries has increased by 7%. (Dave Harp)*

Initially, Guilliams said, farmers were concerned about more government involvement, "but then they turned around and began doing projects."

The use of conservation practices in Smith Creek grew fourfold. About 1,200 best management practices, or BMPs, were put in place — things like manure storage facilities, nutrient-absorbing cover crops, streamside buffers, grazing plans and stream fencing. That's enough to cover 20% to 30% of the watershed land, though the area treated is significantly less because many farms have multiple BMPs.

A Smith Creek Partnership was formed with more than 30 participants, including government agencies, universities, nonprofit organizations, industry groups and others.

Despite that effort, USGS monitoring shows that the amounts of nutrients and sediment leaving the watershed increased since 2010.

Smith Creek wasn't alone. BMPs also increased in the other showcase areas, but water quality shows little improvement. In some streams, nutrients and sediment are increasing.

A USGS study published earlier this year suggests that the BMPs were likely outweighed by the intensification of agriculture, particularly increased animal populations that produce more manure, which often ends up being applied to local fields.

The Smith Creek trends match fairly closely the trends in animal populations, especially poultry, said Jimmy Webber, a USGS hydrologist who was lead author on the paper and represents the agency in the Smith Creek Partnership.

Data also show that the bushels of corn produced per acre in the watershed have increased threefold since 1985. More corn typically requires more nitrogen applications. Soybeans have also increased; soybeans "fix" their own nitrogen from the air, creating yet another nitrogen source.

Webber is quick to point out that this doesn't mean BMPs don't work. "That's not true," he said. "What our work highlights is the complexity of these systems. The potential benefits of these BMPs in some cases can be overshadowed by agricultural intensification and other things happening in the watershed."

"A lot of this is reflecting societal demand and our priorities as consumers and what we like to eat and how our populations have grown in this part of the country," Webber said.

## Pressure to produce

There has been some progress, Guilliams emphasizes. "People say, 'We've been working on it for 15 years. What has changed?' Well, we've got a lot of conservation on the ground that otherwise likely wouldn't have happened."

Portions of Mountain Run, a Smith Creek tributary, were removed from the state's impaired waters list when the diversity of aquatic insects improved as the result of conservation practices. The EPA touts Mountain Run as a success story.

But improving stream health for aquatic insects is often easier than reducing nutrients.

Agriculture is a nutrient-intensive industry. Animals produce large amounts of manure, which gets placed on pastures and crops that are mostly fed back to animals.

As the world's population grows and demand for food rises, production has become more efficient: It takes less feed to produce a pound of meat and less fertilizer to grow a bushel of corn. But those efficiencies are largely offset by increased demand.

Further, the evolution of agriculture in the Bay watershed since World War II has emphasized animal products like meat and dairy.

Although the Bay region still produces large amounts of grain, it imports huge amounts of corn from the Midwest, where productivity is higher and often cheaper, as feed for livestock. "This area is a nutrient sink," Guilliams said. "We're bringing in loads of feed on truck and rail every day."

The result is a large nutrient imbalance, especially in areas with intense animal agriculture that produce more manure than is needed by crops and pastures. The job of Guilliams and others in the Smith Creek watershed and elsewhere is to counteract nutrient imbalances driven by national and even global economic forces.

*Holly Coffman, shown with son Layton, drives a school bus but mostly works on the family farm with her husband Sam. (Karl Blankenship)*

## Staying on the farm

These are all pieces of a puzzle where productivity, profitability and conservation become intertwined. Its complexity becomes clearer by learning about farmers like Holly and Sam Coffman.

"That's our main moneymaker up there on the hill," said Holly Coffman, pointing

*See* **Ag & the Bay**, *page 18*

**Ag & the Bay**, *continued from page 17*

to two turkey houses overlooking their home that were built four years ago at a cost of about $1.7 million.

The Coffmans rear three batches of "light hen" turkeys each year, which grow to about 15.5 pounds, as well as raising cattle and even growing some pumpkins.

Coffman always liked working with cows. She grew up on a nearby farm, raising calves and showing steers at the fair.

In 2015, she and Sam bought their own farm from her grandparents, operating it as a small cow-calf operation, one in which the farm keeps a population of cows to produce calves that are reared for sale.

But that didn't produce enough income for the couple to stay at home, which became more important as they started a family — both worked outside jobs in addition to running the farm.

In 2020, they took out a loan to build the two turkey houses. The decision was "scary" because of the size of the investment, Coffman recalled. "I remember thinking when they brought in the equipment to start moving dirt, 'Is this really what we want to do?'"

They expect to pay it off in about 15 years, which she said is "pretty good" because other operations, such as growing grain, can incur greater costs with less reliable returns.

"It's enough money for us to live off of," she said. "It's not like we live a big, elaborate, fancy life, which is fine with us."

But Coffman still holds another job: She drives a school bus to get health insurance.

Guilliams' NRCS team has worked with the Coffmans on several conservation measures over the years, including a covered winter-feeding facility for the cows, fencing and a water crossing to keep animals out of the stream, a well to provide water for the cows and the development of a new grazing system.

*The USDA's Cory Guilliam discusses pasture management with Caitlan Worsham, coordinator of the Smith Creek Partnership. (Karl Blankenship)*

*Rockingham County farmer Lee Good is experimenting with ways to improve alfalfa production and soil health on land that he rents. (Karl Blankenship)*

After the turkey houses were built, NRCS helped with a litter storage building as well as a composting facility for birds that die.

Guilliams sees it as an investment not only in conservation, but in the future of farming in Rockingham County. The operation became more intense, but it helps ensure that the couple can stay on the land. That's a concern in the county because the USDA found that it lost 15% of its farmland between 2017 and 2022.

"I'm all about the young people," he said. "That's the future of agriculture. If they can't make a living out of it, they're not going to do it. If poultry is a way to do it, that's great."

And it helps meet the growing demand for turkey, which has more than doubled in the last six decades (chicken demand has nearly quadrupled).

"I don't think people realize you have to have commercial size farms for poultry … in order to feed the number of people in this world," Coffman said. "You can't just have little backyard free-range chickens."

## Time and money

The USDA's latest ag census data for Rockingham County illustrates why farmers like the Coffmans increase output. Even as the value of agricultural products increased, farm income decreased as expenses rose.

To counter those trends, farmers often must produce more or take off-site jobs. About 90% of farmers in the county have secondary incomes.

All of that has conservation ramifications. Increased productivity often requires more nutrients, which requires more work to offset pollution.

"That's an unfortunate reality of agriculture, not just unique to Chesapeake Bay or Smith Creek," Guilliams said. "In order to stay viable and profitable, you have to get bigger and when you get bigger, then you are farming more acreage, you're farming more livestock, you have to get bigger equipment. So it just snowballs."

That stretches the management capacity for farmers. "You're getting to the limits of what you can handle yourself or what your family can handle," Guilliams said.

But if farms are not profitable, there will be no money to invest in conservation measures, whether voluntary or required.

In most conservation programs, farmers still must bear some of the costs for projects. And the work is often complex and time consuming. As people farm more acres or take second jobs, time is at a premium.

Generally, BMPs with the potential to save time and money can become widely adopted. One example is no-till or reduced tillage farming, which greatly reduces sediment runoff and saves money in fuel and equipment. Guilliams estimates the adoption rate in Rockingham County is "in the 80 to 90% range."

But many BMPs are far more costly and difficult to implement. Guilliams said the typical streambank fencing project costs about $100,000. The fence is one of the least expensive elements. Nearly every project needs a watering system when cows lose access to the stream, so a well has to be drilled. If the animals are grazing on both sides of the stream, a crossing is needed.

And the fencing setback often takes away some of the best pastureland. That means creating a grazing plan, which may mean more fencing.

Cost share programs usually require farmers to pay around 25% of the project expenses, though in recent years funding from multiple sources can sometimes cover the entire cost.

Even then, Guilliams said, the farmer is on the hook for related costs. Running an electric line to the well pump, for instance, can cost thousands of dollars. Ongoing maintenance also falls to the producer.

Bob Threewitts, who runs a farm in the Smith Creek watershed, fenced his cattle out of the stream about 15 years ago. Threewitts was active with the Farm Bureau and participated in early listening sessions focused on Smith Creek. His motivation, he said, was to show that "before the government starts mandating things, let's show them that we can do the right thing."

Starting with that project, Threewitts estimates he's spent more than $30,000 on cost share projects. He installed a winter-feeding building that collects manure and instituted rotational grazing, which improves pasture health but requires significantly more fencing. When he added three chicken houses in 2011, he also included a storage building to keep the litter dry until it could be applied to the land.

The chicken houses generate between five and six cycles of 140,000 birds annually. That helps provide enough revenue so his

son could join the operation and maybe take it over one day.

"It's a tough go for a young farmer to get started if he doesn't have something handed to him where he can work his way in through the family," said Threewitts, who also does part-time dairy nutrition work outside the farm. "I don't know where you get the capital from."

That's a concern for Guilliams, too. He sees younger farmers as key not only for the future of farming, but for the future of conservation.

"A lot of the BMP implementation we have seen, a good bit, has been younger farmers, newer farmers starting out, or the younger generation taking on the farm operation," he said. "They have been more apt to implement the BMPs."

And there is a lot of conservation work to do. Guilliams acknowledged that a map of BMPs in the watershed would look more like a target hit with bird shot than a systematic effort.

Most pastures in the county are "intensively overgrazed" he said. Most farmers have loans, and bankers often recommend they run more cattle than can be raised sustainably to improve their cash flow. "So that's what we're up against."

Often manure isn't covered or feeding takes place in areas where groundwater can be impacted. The list goes on.

But the "biggest barrier" to conservation, Guilliams said, is that much of the farmland in the county — likely in the 40%–50% range, as in much of the Bay watershed — is rented.

Farmers have little incentive to spend money on BMPs on land they don't own. And the owners, who often live somewhere else, also have little incentive.

## Downstream impacts

Mark Frondorf was sitting with his laptop, flipping through photos of algae blooms on the Shenandoah River.

Some are easily seen on the surface. But equally troubling, maybe even more so, are dense algal mats that blanket the bottom, sometimes made up of harmful species.

"It's a heavy algae bloom," Frondorf said, showing a photo of rocks glazed with greenish-brown algae. "Whether it's toxic requires it to be submitted for testing."

Frondorf, the Shenandoah Riverkeeper, has been battling the blooms — or at least trying to draw more attention to them — for years. They have become summertime features on the river, especially when it's hot and river flows are low.

*Cattle stand on the banks of the North Fork of the Shenandoah River in Rockingham County, VA, in 2021. Algal blooms there have become a recurring problem. (Alan Lehman/Shenandoah Riverkeeper)*

In recent years, he's been submitting algal bloom complaints to the state, initially to little effect.

But in 2021, after a report from Frondorf, the Virginia Department of Health issued a recreational advisory for an 11-mile stretch of the North Fork and then extended it to 52.5 miles, warning that the toxins in the algae could harm humans, pets and livestock.

"It was the first time ever that the department has issued an alert, and it told us that they were paying attention and actually reading our complaints," Frondorf said.

While there are many sources of nutrients in the Shenandoah Valley, the largest source is agriculture. And in recent years, Frondorf has launched a campaign targeting a particularly visible source: cows standing in the river.

He's begun filing complaints under the state's Agricultural Stewardship Act, which triggers an investigation and, if the complaint reveals a credible threat to water quality, the state and local conservation districts have 18 months to work with the farmer to fix the problem.

There were about 80 farms where cattle were allowed directly into the Shenandoah when he started in his position nine years ago, but it's "now down to single digits." That's in the mainstem of the river — not its tributaries like Smith Creek.

Frondorf said he sends a letter to the farms before making complaints, pointing out the availability of funding to install fencing.

"If we don't hear anything, then we will file a formal complaint," he said. "But initially, we try to be decent and just send them a letter alerting them that 'Hey, you may not be aware of this available funding.'"

Other environmental groups have taken up the cause as well, spurring state legislation that promotes streambank fencing and holds out the possibility that fencing could be required if enough progress is not made by July 1, 2028.

Frondorf acknowledged that farming is a tough business. In some cases, he has decided against filing a complaint.

Still, he expressed frustration that, when it comes to managing nutrient runoff, "we're barely holding our own." And Frondorf, a former river guide, notes that the economic impact is often felt by others downstream.

He's not alone. Jon Mueller, who heads the Environmental Law Clinic at the University of Maryland Baltimore, recently published an article in the *Environmental Law Reporter*, arguing that four decades of Bay cleanup work have largely failed because state and federal governments have not more aggressively used their authority to control farm runoff.

"This notion that all farmers want to do the right thing in terms of the land is just not accurate," Mueller said.

"They're a business and whatever affects their bottom line affects their decision making. And if they don't have to put in BMPs or controls, like any other pollutant source, why should they want to do that voluntarily?

"I get that farming is difficult. My grandfather was a farmer, and I know exactly how hard it is. Friends of mine are farmers in Virginia. I've worked on their farms. So, it's not like I have a thing out for farmers. It's just [that] they're polluting sources like all of us, and they have to do their part."

## The path ahead

Fifteen years after being designated a showcase watershed, efforts continue in Smith Creek. But will patience run short before the efforts there and elsewhere show quantifiable results?

Some new actions could help make a change. In recent years, the state has been subsidizing the transport of poultry litter to places outside Rockingham County to reduce its application to local fields. Less than 10% of the county's litter was transported prior to 2020, when the USGS concluded its study. In 2023, about 20% was transported. The state plans to move much more out of the county in future years.

It's also not clear that the poultry expansion will continue. Hobey Bauhan, president of the Virginia Poultry Federation, said the increase that took place after Smith Creek became a showcase watershed coincided with a recovery in broiler production after a statewide decline around 2011.

"In order for there to be a big increase in actual production, the processing capacity would have to increase," he said. "In the last 10 years, broiler chicken processing capacity in the valley region has increased, but I'm not aware of any further plant expansions at this time."

Meanwhile, the National Fish and Wildlife Foundation several years ago provided a grant to the Alliance for the Shenandoah Valley to boost progress by supporting a full-time position to coordinate the work of government agencies, nonprofit organ-izations and farmers and to promote conservation tactics.

And War Branch, a 12-mile subwatershed of Smith Creek, was recently selected as one of five very small-scale monitoring sites in the Bay watershed to, again, test locally whether farm conservation practices can drive nutrient levels down.

War Branch has several clusters of farms with widespread use of BMPs, and a more focused effort might tip the balance in the right direction.

The Smith Creek watershed is too large to directly tie actions on the land with water quality changes, said Webber of the USGS. At War Branch, they hope to make those connections. "We want to make sure that folks in the agricultural sector feel like their story is being told accurately," he said.

Guilliams is optimistic they will see results, given time and a lot more miles of back-road travel. ■

# Developer agrees to abandon plans for Abingdon Woods

## Settlement ends long legal fight over Maryland forest conservation, but site's future is unclear

**By Timothy B. Wheeler**

A planned warehouse development in Harford County, MD, that tested the strength of Maryland's forest conservation law has been abandoned, ending a long legal struggle but leaving the fate of the remaining woods and wetlands in limbo.

The parties involved in building a business park on a 326-acre tract known locally as Abingdon Woods have agreed to drop the project, Harford County Executive Robert Cassilly announced July 22. He called it a "milestone agreement," which commits the developer, BTC III I-95 Logistics Center, to stabilizing the cleared construction site and replanting trees on four of the 70 acres of forest that have been bulldozed.

A previous county administration in 2020 approved plans to build four large warehouses and other commercial structures on the site, which is in an otherwise heavily developed area along Interstate 95. But it drew opposition from residents and environmentalists, who called it the largest remaining forested tract near the upper Western Shore of the Chesapeake Bay.

The Chesapeake Bay Foundation and some residents filed lawsuits contending that the county had violated state and local forest conservation laws in approving the plans to clear 221 acres. In particular, they challenged a waiver that approved the removal of 49 large "specimen" trees.

The case went to the Maryland Supreme Court, which ruled in 2022 that the project opponents had a right to challenge the developer's forest conservation plan. A lower court then held that the county had improperly approved the plan.

Meanwhile, Cassilly took office that year, vowing to reconsider the county's favorable policies toward big warehouse developments in light of their impact on nearby communities and the environment. He persuaded the Harford County Council to place a temporary moratorium on approving any new projects, then pushed through legislation to limit their size and scope.

In response to the Supreme Court decision, Cassilly ordered county staff to conduct a fresh review of the plans for the business park. In the meantime, he ordered the site-clearing to halt. The developer then successfully sued the county, which promptly appealed.

*Tree clearing was underway at Abingdon Woods in Harford County, MD, shown here on Aug. 30, 2022, before development was halted and taken to court. (A.J. Metcalf/Chesapeake Bay Foundation)*

Under the announced settlement, all parties agree to drop their litigation, and the county revokes all approvals for the project.

"Harford County welcomes appropriate development that brings well-paying jobs, boosts economic activity, protects the environment and enhances our quality of life," Cassilly said in a press release announcing the settlement. "That means proposals must fully comply with development requirements before they can move forward."

The Chesapeake Bay Foundation called the settlement "a positive step for forest conservation and clean water," noting that Abingdon Woods is just upstream of the Bush River, a Bay tributary.

"Despite the damage that's already been done at Abingdon Woods, this settlement between Harford County and the developers is a step in the right direction," said Paul Smail, the foundation's vice president for litigation.

"Any reforestation at Abingdon Woods — even only four acres, two of which will restore the buffer adjacent to residences — will support healthier waters in Haha Branch, which flows into the Bush River and ultimately the Chesapeake Bay," he said. He noted that Bush River is already classified as impaired with high levels of sediment from stormwater runoff.

Tracey Waite, a member of the Coalition to Save Abingdon Woods, said development opponents were grateful for Cassilly's actions. But she noted that the settlement only calls for replanting trees on less than four of the 70 acres of woods already cleared, and it does not rule out another development, including a warehouse project.

"The owner could bring in a new developer and put this large tract of forested wetland at risk tomorrow," she said by email. "The goal of the coalition and community is preservation."

County spokesman Matthew Button said officials have been trying "to preserve and protect the environmentally sensitive areas of this Abingdon Woods property." They worked with the Harford Land Trust to line up federal and state grants for that purpose, he added.

"So far, however," Button said, "the property owners do not appear to be interested in preservation."

Harford Investors LLP, which represents the landowner, did not respond to an email asking for comment on the settlement or future plans for the property.

Waite said county officials still have a chance to at least limit future development there as they undertake a 10-year reassessment of Harford's land use zoning. She urged them to change the property's zoning designation from commercial-industrial to agricultural because of the many homes the county has allowed to be built along its borders. ■

# Eastern Shore companies fined for environmental violations

## Maryland levies fines on Perdue soybean facility and Valley Proteins poultry plant

**By Jeremy Cox**

*The Perdue AgriBusiness soybean processing plant in Salisbury, MD. (Jeremy Cox)*

Two major agricultural companies ramped up operations recently on Maryland's Eastern Shore, and the environment paid a price, according to the Maryland Department of the Environment (MDE).

One case resulted in the agency's second-largest cash penalty in its history. The other has reopened a long-running saga that local environmentalists hoped had been resolved.

Perdue AgriBusiness, a subsidiary of poultry giant Perdue Farms, landed in hot water, state officials say, after the company expanded its Salisbury soybean processing facility without a permit or proper air pollution controls. That resulted in a $12 million settlement announced in July by MDE and the Maryland Attorney General's Office.

Perdue applied for a permit in 2017 but withdrew the application the following year after MDE indicated it would require additional review.

The company went ahead anyway with the installation of the new machinery in September 2017, followed by a second round in May 2019, according to the settlement agreement.

After the plant's expansion, the hexane emissions exceeded the 40-ton annual threshold to be considered a new "major source" of pollution, MDE alleged. Hexane is a volatile organic compound, a major ingredient in ground-level ozone that can worsen an array of breathing problems, from asthma to emphysema.

MDE records show annual VOC emissions increased at the facility by 28%, from 246 tons in 2017 to 315 tons in 2019.

"Everyone must follow the rules which are in place to keep Marylanders safe. When Perdue failed to comply, it was the community who suffered the undue burden, so there must be meaningful penalties," said Attorney General Anthony Brown. "I am glad that Perdue has accepted responsibility and will be investing in the surrounding neighborhoods moving forward."

The settlement calls for Perdue to pay an $8 million fine to the state. The only larger civil penalty in MDE's history was the $29 million settlement in 2018 with Volkswagen over the auto manufacturer's efforts to circumvent emissions tests.

Perdue also must install $3.5 million in pollution-reduction measures at the plant and contribute $400,000 to Salisbury for a tree planting campaign.

In separate press statements, the two sides left a muddled picture about when and how the problem came to light. MDE's legal complaint says that agency staff and Perdue representatives "met at various times" to discuss the cause of the emission increases. It wasn't until correspondence on April 11, 2022, that Perdue "finally admitted" it had installed the equipment without a permit, MDE alleged in a legal complaint.

Meanwhile, Perdue spokeswoman Kate Shaw said in a statement that the discrepancy was "discovered in May of 2020, as part of our air permit renewal process." Her statement doesn't indicate who discovered the discrepancy or whether state inspectors were aware of it at the time. She added, "We take full accountability for what occurred. The individuals who did not reapply for the permit are no longer with the company."

When asked for clarification via email, Bill See, another Perdue spokesman, replied, "Our original statement stands on its own."

In a separate case, MDE charges that Darling Ingredients, owner of the Valley Proteins poultry rendering plant in Dorchester County, has violated its October 2022 consent decree. Under that settlement, Darling Ingredients agreed to pay $540,000 to the state while fixing wastewater and stormwater problems at the troubled plant.

"I would say this facility is in no better shape than it was in 2021 when we filed the lawsuit," said Matt Pluta, the Choptank Riverkeeper and director of riverkeeper programs at ShoreRivers, one of the environmental groups whose lawsuit triggered the decree. "In fact, it's probably gotten worse."

A few months after the settlement was signed, MDE renewed the plant's discharge permit, allowing a nearly four-fold increase in the amount of wastewater it can release into the Transquaking River, a nutrient-impaired Chesapeake Bay tributary.

Problems have piled up since that approval. MDE inspectors say they uncovered 51 violations of the requirement to maintain at least 2 feet between the surface of the wastewater lagoons and the top of the holding pits. In May, MDE announced plans to fine Darling $15,000.

The Texas-based company contested the fine, arguing that all the exceedances fell under an exception in the decree for lagoon levels to rise because of heavy rainfall.

MDE also contends that the plant has been hauling away production waste without going through the complete treatment process. Farmers use the treated material to fertilize their fields.

Darling representatives have told the state they believe their current permit allows the hauling to continue. Ongoing upgrades to the wastewater treatment plant, required as part of the 2022 decree, will largely reduce, if not eliminate, such hauling, they say.

"We have responded to the MDE and share its commitment to resolving this issue through the established MDE process," Darling spokeswoman Jillian Fleming said.

The agency notified Darling in June that it was referring the hauling matter along with other recent violations to the state Attorney General's Office. ■

# As land turns salty, farmers grapple with lost income

## Saltwater increasingly invades farmland on the Bay's Eastern Shore

**By Jeremy Cox**

*Rick Abend walks a saltwater-compromised field on his leased farmland in Dorchester County, MD. Flooding that used to occur about every other year now happens three times a year. (Dave Harp)*

The rate of sea level rise is incremental, typically measured in millimeters per year. But Pat Neild has lived long enough to witness how those millimeters have added up.

"In my lifetime, which is 94 years now, the sea level has come up at least a foot, maybe 18 inches," said Neild, the owner of a large grain farm on Maryland's Eastern Shore that is slowly being overtaken by the Chesapeake Bay. "I can tell that by the land that we can't till anymore."

The main issue is that the swollen Bay spills onto his land more often, he said. It would only be a temporary headache if the incoming tides and storm surges were freshwater. But the water is brackish. And when it retreats, it leaves behind a farmer's worst enemy: salt.

"Once it is salted, it takes at least five or six years for it to return [to normal], and we've had some tides since then that have encroached over the edges of some of the fields," Neild said. "It's moved the farming land back considerably."

Across the portions of Maryland and Virginia east of the Bay, saltwater intrusion is a widespread and growing problem. Using satellite imaging, researchers for the first time last year measured the scale of farmland converting into salt patches and salt marshes in the region, finding approximately 9,700 acres lost in Maryland and 2,200 acres in Virginia as of 2017. Both figures represented steep increases compared with imagery collected just six years earlier.

In agriculture, land is wealth. The less of it you can farm, the less money you can make from it. So, the rapid pace of saltwater intrusion has triggered an unprecedented effort to save an industry and a way of life.

That the drama is unfolding barely an hour's drive from the nation's capital serves only to heighten the stakes. What is done to blunt climate change for coastal farmers on the front lines here, experts say, will likely provide a roadmap for efforts elsewhere.

"We started out and no one cared, and now a lot of people care about it," said Kate Tully, a University of Maryland agroecologist whose research team has been studying the region's threatened farmland for more than six years. "If you look at it from the landowner's perspective, the way I think about it is that we need to help incentivize good decisions."

But the help might not come in time. "For some lands, it's just late," said Pinki Mondal of the University of Delaware, the lead author of last year's salt-mapping paper. "We just can't get anything out of it."

Meanwhile, the potential solutions — such as subsidizing flood-protection measures, creating markets for crops with higher salt tolerance and paying landowners to create wetlands — still face a host of unknowns.

"I think we're still at the point where we don't know enough," said Jarrod Miller, a soil expert and farming consultant, also at the University of Delaware. "I don't have a grasp on what's going to work here. On everything, we're behind. On practices, we don't know."

### The rise of salt

It doesn't take much for Rick and Kathy Abend's land to flood. For about 50 years, they have owned a loblolly pine plantation near the community of Madison in Dorchester County, MD, and leased adjoining cropland to a tenant farmer.

A two-lane, state-maintained highway separates the property from the mouth of the Little Choptank River, a Chesapeake tributary. Although the raised roadbed acts as a flood barrier, storm-angered waters and significant high tides still find their way through culverts and up ditches to flood his low-lying land, Rick Abend said. It used to happen maybe once every other year; now, it's three times a year.

Soybeans are a staple on Eastern Shore farms, harvested to help feed the 600 million chickens produced annually for the region's meatpacking plants. But on several acres of the Abends' land, especially those closest to the road, the plants struggle to grow.

"It's getting worse, I think, over the last 10 years or so," Abend said, surveying the sparse soybean crop at his feet on a recent sun-soaked afternoon. "It used to get a nice crop out of this field."

With each flood, the soil gets saltier. In the worst spots, the ground is pure white like powdery sand. Here, the gaps between sickly soybean specimens extend up to a few feet or more, gradually giving way to bare earth.

Harold Travers Jr., who leases both the Abend and Neild tracts for farming, said it's getting harder to make a living on the land. But he has little choice economically but to keep planting and hoping for the best.

"It seems like you keep trying even when you know what the outcome is going to be," he said.

Eastern Shore farmers are on the vanguard of this climate-fueled trend, researchers say. (Although the Western Shore also abuts the Bay, increases in elevation are steeper in most places, minimizing coastal floods.) In the Bay region, water has risen about a foot over the past century, about twice as fast as the worldwide average, studies suggest. That's because not only is the water rising, but the land is also sinking — owing to the gradual resettling of the Earth's crust after Ice Age glaciers retreated. Up to 4.9 feet of sea level rise is possible by 2100, according to the University of Maryland Center for Environmental Science.

If that happens, untold acres of land, including many waterfront farms, will become submerged or morph into marsh. Some of the lowest-lying fields are already transitioning, as demonstrated by a growing frequency of flooding and increasing salt concentrations in the topsoil.

Tully has learned to recognize the telltale signs. "Sometimes, it's just an edge of the field where you can tell it's been really salty or inundated," she said. "You'll actually see salt crystals on the ground, and it's shiny."

### Economic damage

In their study, Mondal and her colleagues tried to quantify the economic pain farmers on the Delmarva Peninsula (which incorporates the Bay's eastern shores of Maryland and Virginia and nearly all of Delaware) are experiencing from the expansion of salt patches. Their calculations assumed that the patches would produce zero profits for growing corn. And they added all land within 200 meters (or 656 feet) of the patches to encompass the areas at greatest risk.

Under that scenario, farmers would have lost $58 million in 2011, they estimated. By 2017, that total nearly doubled to $107 million because of the salt's rapid spread in those intervening six years.

"It has been going on for a while, but, because it has been invisible, people weren't paying attention. One way you get people's attention is to attach a dollar amount to it," Mondal said. "It's a huge problem. It's not a local problem or an isolated problem. This issue is not stopping on the farm fringes on coastal lands."

As Mondal and many other scientists see it, the responsibility for saltwater intrusion's economic costs shouldn't end at the edges of farm fields either.

"It's a collective problem. We can't just tell them to just bear the cost, because they have been on the receiving end for generations," Mondal said. The two Maryland counties with the highest percentage of salt-impacted farmland — Dorchester and Somerset — also have among the top five highest poverty rates in the state.

"You can't really build a seawall or anything that's going to protect the whole coastline," Tully said. "So, people are

*Pat Neild shows the salt damage to a sorghum field on his farm on Taylors Island, at the Bay's edge west of Cambridge, MD. (Dave Harp)*

*This aerial view of Pat Neild's Taylors Island farm reveals large patches of salty soil encroaching on his sorghum crop. (Dave Harp)*

picking and choosing" which properties to save. She added, "It's definitely an environmental justice issue."

But researchers are only just beginning to turn their attention toward finding solutions for farmers.

"In the last five years, we've identified the problem," said Matt Kirwan, a coastal ecologist with the Virginia Institute of Marine Science who studies the influence of climate change on marshes. "The next five years, we'll be identifying solutions."

## Search for solutions

Harold Travers Jr., the Dorchester County farmer, does what many farmers do when their yield declines from saltwater intrusion: They keep farming. To reduce their financial losses, they turn to federally subsidized crop insurance.

It's unclear how well that strategy works, though. Nate Bruce, a University of Delaware farm business management specialist, said the phenomenon is so new that he was unable to pinpoint any scholarly writings about it.

"Not a single thing exists," he said. "This is sort of uncharted territory. I think putting together a fact sheet on this is something I should be working on."

To file a claim, a farmer must check a box identifying the offending cause, such as a drought, freezing temperatures or disease. Saltwater intrusion isn't one of the options, Bruce said. "Unless you had field flooding or something really obvious, a crop insurance agent probably doesn't really know how to evaluate that," he added.

And even if they can receive a payment, those farmers likely will face diminishing returns in future years, Bruce explained. That's because payments are typically tied to a farm's previous 10 years of revenue. As saltwater eats away at a farm's productivity, the dollar amount covered by insurance will decline as well, he said.

Farmers can take steps to delay the onset of saltwater intrusion by irrigating their fields to flush out the salt or spreading gypsum to dislodge sodium from the soil, experts say. But neither is of much help if the fields don't drain well enough, and that is increasingly the case on many farms, said Miller of the University of Delaware.

Corn and soybeans are the tried-and-true money crops on the Eastern Shore. But neither fares well in salty conditions, experts say. A vein of the research is exploring which crops thrive best in the region's marginal soils and whether they can be harvested for profit.

There are environmental benefits as well, researchers say. Many of the crops being tested require no fertilizer, which would mean less nutrient pollution leaching into the Chesapeake Bay and its tributaries. And the plant material stores carbon, helping in the fight against climate change.

Scientists have fanned out across the peninsula, planting atypical crops such as barley, quinoa, switchgrass and salt marsh hay. Some show promise. But it will take several more growing seasons and years of research to give Bay region farmers the answers they need, Miller said.

"There's plenty of salinity work across the entire planet because of drier climate, and some of it applies [locally] but not all of it applies," he added. "You have to learn. So that's why I feel we're behind."

Then, another daunting challenge lies ahead: finding a market for those crops. Agriculture on the Eastern Shore revolves around the poultry industry. In one of the most notable efforts to create an alternative market, a $5 million USDA grant is funding work by the University of Maryland Eastern Shore and College Park to mix chicken manure with switchgrass for producing biogas.

"There's no current market," said UMES plant professor Jonathan Cumming. "Right now, we're all looking for that potential economic driver."

Land preservation advocates are also responding to the saltwater crisis. The biggest tools at their disposal are conservation easements, which offer landowners financial benefits in return for shielding their land from development. Depending on the program, the land can remain in farming or undergo restoration into a wetland.

But salt-impacted lands present special challenges, said Dave Satterfield of the Eastern Shore Land Conservancy. Funders are wary of investing in properties that are apt to be underwater within a few decades. And many landowners are put off by the relatively low dollar amounts per acre that land conservation programs are offering.

In general, getting help to rural areas affected by saltwater intrusion and other climate change impacts is more difficult than in urban areas, Satterfield said.

"It's easy for the federal government to see that I have 1,000 homes impacted by sea level rise in this town," he explained. "It's a hard sell when it's one property with the same amount of shoreline with two houses on it. It's the same impact, but it's affecting less people." ■

*A lone soybean plant struggles to survive in the salt-laden soil of Rick and Kathy Abend's leased field in Dorchester County, MD. (Jeremy Cox)*

*Video online at bayjournal.com*

# MD strives for conflict-free oyster restoration in Eastern Bay

## Effort to boost sanctuaries, public fishery and aquaculture alike still criticized

**By Timothy B. Wheeler**

After years of acrimony between watermen and environmentalists in Maryland over restoring oysters in the Chesapeake Bay, the state is trying a new tack in Eastern Bay. Whether it works remains to be seen.

The broad embayment on Maryland's Eastern Shore is targeted by a 2022 law to receive $2 million a year over the next 25 years to revive its once-thriving oyster population. The effort is getting under way as the state nears the finish line on a massive push to build and stock oyster reefs in five other of its Bay tributaries.

Those projects, begun a decade ago, have poured nearly $90 million into putting 6.9 billion hatchery-reared bivalves on reconstructed reefs, all in sanctuaries off-limits to public harvest. Though hailed by environmentalists and scientists for restoring long-lost underwater habitat, the projects have drawn repeated complaints from watermen — and even litigation.

This time, instead of focusing solely on rebuilding reefs in sanctuaries, the Department of Natural Resources aims to replenish reefs for the public fishery as well and even give a boost to aquaculture.

"Sometimes the really successful things we do are highly controversial," said Lynn Fegley, DNR's fishing and boating services director. "This is more of a kumbaya approach."

Controversy and delays dogged those earlier projects, which were called for as part of a 2014 strategy to bring back the Bay's water quality, habitat and fish populations. Maryland and Virginia each pledged to restore large oyster reefs in five Bay tributaries by 2025.

The fifth and largest restoration project, in the Manokin River on the lower Eastern Shore, was stalled for more than a year by a lawsuit filed at the behest of watermen, who were upset about once-productive reefs there being placed in sanctuaries.


*Richard Lapeach sprays juvenile oysters, or "spat on shell," into the mouth of the Wye River in Maryland's Eastern Bay on June 13. The vessel deposited a total of 15.6 million spat on a sanctuary reef there. (Dave Harp)*

*Shells holding young oysters are sprayed onto a sanctuary reef in Maryland's Eastern Bay. (Dave Harp)*

### Inclusive approach

In Eastern Bay, at the direction of state lawmakers, DNR officials are trying to avoid conflicts by offering everyone a piece of the action. The plan is to rebuild the bivalve population in a way that improves water quality and fish habitat but also provides economic benefits for watermen and oyster farmers.

"It's really inclusive, rather than exclusive," Fegley said, "and hopefully they all support each other … Oysters beget oysters."

Eastern Bay differs geographically from the areas DNR previously chose for large-scale reef restoration, making it more suitable for this all-hands approach. Those tributaries were set aside in their entirety, or nearly so, as sanctuaries. In Eastern Bay, three fourths of the 21,000 acres of historic oyster bars are still available for harvest and one fourth is off limits. Moreover, the seven sanctuaries there are scattered around the bay and its two tributaries, the Miles and Wye rivers. About 41 acres of bottom are leased for aquaculture.

Eastern Bay once yielded a significant share of Maryland's wild oyster harvest, and the bounty was great enough that it provided young "seed" oysters for transplanting to other parts of the Chesapeake. In 1997, DNR's annual reef survey found a record "spatfall" there of naturally reproduced baby oysters.

Disaster struck two years later, when a severe four-year drought triggered diseases that devastated oyster populations throughout the Chesapeake. Eastern Bay was particularly hard hit and has struggled to recover. A wild harvest that peaked at 150,000 bushels in 2001 fell precipitously to as little as 150 bushels at one point. Since 2008, it has yielded less than 20,000 bushels annually, according to DNR data.

"I've got places I oystered back in the '90s," said Queen Anne's County waterman Troy Wilkins. "You go there today, and you can't find a shell."

In 2019, hoping to bridge the differences between environmentalists and watermen, state lawmakers directed DNR's Oyster Advisory Commission to provide recommendations for reviving the state's oyster population. After more than a year of debate, restoring Eastern Bay was the only substantive action that 75% of the commission's members could agree on.

### Legislative commitment

Even before that, local watermen had been doing modest plantings and trying to improve public reefs in Eastern Bay, using their share of about $2 million in oyster replenishment funds generated annually from oyster license fees and harvest taxes plus dedicated state funds. DNR and nonprofit groups had also done some relatively small plantings on sanctuary reefs.

In 2022, though, the General Assembly passed legislation to carry out the commission's recommendation, calling for a larger mix of wild reef replenishment, sanctuary restoration and aquaculture enhancements. The legislation also directed $2 million a year be spent solely in Eastern Bay over the next 25 years, divided equally between sanctuaries and public fishery areas. The initiative is to be reassessed every five years.

The effort began in earnest in 2023, when WRF Group, a Cambridge-based oyster hatchery contracted by DNR, spread 210 million juvenile oysters over 52 acres of sanctuary reefs. While other projects relied on the state's Horn Point oyster hatchery run by the University of Maryland Center for Environmental Science, this one farmed out oyster production to private hatcheries.

"This is the first time a project like this has been available for private industry," said Ricky Fitzhugh, owner of WRF. He has rebranded the company as Seed to Shuck Ventures, reflecting its expansion into oyster restoration.

No comparable plantings occurred in 2023 on public reefs.

"It took longer to get the industry situation online," said Chris Judy, DNR's shellfish program manager. "We were ready to move faster with the sanctuary component."

This year is supposed to see more balanced plantings. Seed to Shuck Ventures got another $1 million to plant in sanctuaries. Contracts for public reef replenishment were spread among three oyster businesses run by watermen: Farm Creek Oyster Farm and Madison Bay Seafood in Dorchester County, and Wittman Wharf Seafood in Talbot County.

And because the supply of oyster shells in the Chesapeake has been stretched thin, all four businesses expect to use oyster shells that have been trucked in from the West Coast.

## Plantings delayed

Nature threw a curve, though. Hatcheries have struggled to produce oyster larvae because heavy winter and spring rains lowered the salinity of Bay water below what's needed for effective reproduction. Seed to Shuck, which had hoped to begin planting in late April, didn't get going until June, when it put the first installment of 15 million spat on shell on a sanctuary reef in the Wye River.

On a warm, sunny afternoon, a high-pressure water hose blasted oyster shells off the deck of the vessel *Gregory Leonard* as it churned back and forth just inside the mouth of the Wye. Each shell bore hatchery-reared baby oysters no bigger than specks, sent to the bottom to grow and multiply — if they survive that long.

*Biologist Natalie Ruark, director of oyster production for Seed to Shuck Ventures, checks the brood stock at the company's hatchery on Maryland's Hooper's Island. (Dave Harp)*

The first public reef planting did not take place until the last full week of June. By early July, 40 million spat on shell had been deposited on public fishery reefs — out of a hoped-for total of 240 million.

Meanwhile, the nonprofit Oyster Recovery Partnership, which DNR has tasked with overseeing the public reef plantings, has pulled together a broad-based group of stakeholders to forge a consensus on oyster management and restoration work in Eastern Bay.

Along with brainstorming how and where to spend the $2 million a year from the state, the group wants to figure out how to enhance oyster aquaculture, which has had to contend at times with pushback from watermen opposing leases on the public bottom.

*Ricky Fitzhugh of Seed to Shuck Ventures looks over a bin of West Coast oyster shells at the firm's hatchery on Hooper's Island, MD. With native Eastern oyster shell supplies stretched thin, the state has approved using shells from the West Coast. (Dave Harp)*

"There's not an expectation coming out of this that there would be any assistance to a business or private entity," said Scott Budden, partner in Orchard Bay Oyster Company, which has leases in Eastern Bay.

The discussion instead has been about making it easier to get leases and whether there might be other areas made available.

"There's not a committed funding source, but [oyster farmers] have a place at the table," DNR's Judy said.

The Eastern Bay Coalition, as it's called, also has talked about ways to enhance the area's economy with recreational activities, increase awareness about the value of a robust oyster fishery and support the industries dependent on it.

Unlike the often-contentious meetings of DNR's Oyster Advisory Commission years ago, the Eastern Bay Coalition's discussions, according to some participants, have been civil and fruitful.

"This is much more constructive and productive," said Olivia Caretti, coastal restoration program manager of the Oyster Recovery Partnership, who helps lead the deliberations.

## Watermen still unhappy

"Not everybody agrees," said Ben Ford, the Miles-Wye Riverkeeper. But he called that normal and good. "We have so many different stakeholders that it's natural there's a diverse range of opinion about how to use these resources."

Some watermen aren't happy, though, with the way the Eastern Bay project has gone so far. Wilkins, the waterman in Queen Anne's County, said he quit going to coalition meetings because of the slow pace of decision making.

"All they do is talk," he said. "We want something done. The money being spent to have those meetings could be better utilized by purchasing spat on shell, seed oysters or oyster shells."

By mid-June last year, he recalled, the relatively small regular annual planting of spat-on-shell was well underway. This year, what should be a much larger planting has been hampered by the hatcheries' struggles. He worries time will run out before all the plantings can be done this summer. Under the circumstances, the $1 million a year dedicated to replenishing reefs open to wild harvest isn't doing much good, he contended.

Unlike some watermen, Wilkins said, he's not opposed to restoring oyster reefs in sanctuaries. He's not against using hatcheries, either, to make up for spotty natural reproduction. Despite a boost from bountiful natural reproduction last summer, Eastern Bay is still so barren, he said, that reviving it will take an all-out effort, using every means available.

"Any oyster on the bottom is a good oyster," he concluded.

But Wilkins said there's a more efficient way to spend the money: namely, dredging up fossil shell from Man O'War shoal, a moribund reef near the mouth of the Patapsco River; hauling it south to Tangier Sound, where wild oyster reproduction is generally good; and then bringing the spat-laden shell back for planting in Eastern Bay.

The state once maintained the fishery for decades through such a "seed and shell" transport program but ended it 20 years ago after diseases devastated Bay oysters. And despite DNR getting a federal permit in 2018 to dredge 5 million bushels of shell from Man O'War shoal, the state has not done so. Recreational anglers and some watermen have successfully opposed dredging there, arguing it would harm vital reef habitat for striped bass and other fish.

Ford said he hopes Wilkins will reconsider and rejoin the coalition. While the process is taking time and they've lost some opportunities to make quick progress, he suggested that, given the 25-year timeline of this project, it's important to stick with it.

"We're talking about $2 million a year for a long time," he said. "it's not something [where] one season or two is going to be a silver bullet." ■

# Active or passive? Plans for new PA park spark controversy

## Opinions differ on visions for use of Big Elk Creek State Park

**By Ad Crable**

*Big Elk Creek runs through Big Elk Creek State Park in Pennsylvania on its way to the Elk River and Chesapeake Bay. (Anteia Consorto)*

The Pennsylvania Department of Conservation and Natural Resources, strained by the record use of its 124 state parks in recent years, is trying to expand access to the outdoors and support Pennsylvania's initiative to promote a recreation-based economy.

But in creating Big Elk Creek State Park in September 2022, DCNR has found its vision of making the property "a destination" heatedly rejected by the local populace.

Residents, local officials and private foundations in Chester County in southeastern Pennsylvania have spent three decades fighting to save the 1,800 acres of historically significant open space, long owned by Campbell Soup Company family member George Strawbridge Jr.

They say that, throughout the process, the state assured them that the land would remain a day-use-only, semi-wilderness refuge for quietly roaming the landscape. But now, they say, the state has reneged on that assurance. In late November DCNR unveiled a draft plan for the new park that included the possibility of camping, cottages and a visitor's center, among other things.

The clash has grown so heated that armed guards were posted at strategy meetings and the transcripts of some discussions hid the names of citizen task force members for fear of reprisal.

"As a lifelong resident of southern Chester County, I can tell you that I have never seen an issue galvanize an area like this," state Rep. John A. Lawrence, a Republican representing the part of Chester County the state park is in, wrote to Democratic Gov. Josh Shapiro. In the letter, Lawrence urged Shapiro to write an executive order that would keep the land as a preserve.

Former owner Strawbridge, an educator, horse breeder and past director of the Buffalo Sabres ice hockey team, has called the plans for a busy state park "outrageous" and accused DCNR of going back on its word.

"Nobody is arguing there couldn't be improvements," said Anteia Consorto, co-founder of a citizen's group formed to keep the park usage low impact. "The problem comes in where you want to bring in all this infrastructure. This is not what this park is supposed to be about. It is surrounded on three sides by homes. In the grand scheme of state parks, it's pretty tiny."

Less than two years ago, though, there was celebration over the park's creation.

For more than a decade and at a cost of $32 million, the state, county and land conservation groups had acquired piecemeal some 1,800 acres of woods and farmland originally assembled by fox hunters in fast-developing Chester County, which borders Maryland and Delaware. Fifteen species of endangered or rare native plants have been found on the property.

In late 2022, then Governor Tom Wolf announced that the properties — which have ties to the Underground Railroad and the Lenni Lenape Native Americans — would become Big Elk Creek State Park. Residents and public officials saw it as the culmination of efforts to save the open space and preserve its use as a bucolic escape from the suburbia creeping in from all sides.

In announcing the park, a senior official for DCNR said, "The park will remain largely undeveloped for some time to come. And it will always remain a place designated for low-impact recreation."

Not only would the countryside avoid becoming another housing development, but it would also adjoin the 1,388-acre White Clay Creek Preserve and the 5,656-acre Fair Hill Natural Resources Management Area just across the state line in Maryland.

Together, at more than 8,000 acres, the block of preserved open space is one of the largest such landscapes in the Mid-Atlantic.

But the euphoria dissipated on a single night in November 2023, when approximately 400 people packed into a local university for their first peek at what the state park might look like.

Instead of seeing images of a day-use area for hiking, bird-watching and other passive recreation, many people were outraged to see slides showing overnight camping, RV hookups, cabins and a visitors center. The presentation also showed a park office for a staff of a dozen, maintenance buildings, a restroom with a water treatment plant, and pavilions. Altogether, the added facilities had an estimated cost of $14 million.

Lawrence said that many in the audience were "incredulous." He decried the plans to turn the landscape into "a major tourist attraction that was completely out of step with the desires of the community and the clear intent of many who fought to preserve the property."

A grassroots citizens group, Save Big Elk Creek, popped up to fight the plans. A lawsuit is possible. Petitions have been circulated and given to the governor and DCNR. The three townships where the state park is located assembled a town hall meeting in which more than 500 people bombarded DCNR officials with protests.

County Commissioner Eric Roe said DCNR should apologize for the "panic" the agency caused.

DCNR representatives admitted mistakes in initial communications with residents and said the usage options presented to the public were only possibilities. Plans for overnight camping and lodging have been dropped, even though DCNR said its survey of area park users showed more than 70% support for them.

Pit toilets are now planned, instead of an electrified bathroom, and some buildings have been consolidated. In addition, an advisory task force made up of local residents and officials was formed to guide the agency in coming up with a master plan for the property.

When DCNR assumed ownership of the land from the Conservation Fund, there were conditions, but nothing "that precluded state park improvements," said DCNR spokesman Wesley Robinson.

Meanwhile, work to improve the land environmentally has begun. Approximately 272 acres of former farm fields are being converted to forests and meadows for pollinators, ground-nesting birds and a wildlife corridor. Studies have begun on restoring degraded wetlands and 3.5 miles of Big Elk Creek, which flows into the Elk River and Chesapeake Bay.

With help from the Alliance for the Chesapeake Bay, more than 74,000 trees and shrubs have been planted along streams, the largest riparian buffer project in DCNR's history.

But the balance between passive and active recreation has yet to come into focus, as task force meetings on the management plan continue.

"DCNR's Bureau of State Parks is committed to improving and enhancing safe and sustainable public access to Big Elk Creek State Park," Robinson said. "Providing access for all is a goal. Making these improvements is necessary to be able to provide opportunities for healthful outdoor recreation, environmental education and natural and cultural resource interpretation, and the public's general enjoyment of the state park."

Many local officials and advocates for a preserve do not believe DCNR will back off on plans to develop the park. A lawsuit may be the next step, Consorto said. ■

# CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

# Curious about catfish?





Catfish belong to the order Siluriformes. These fish are known for their barbels and smooth-skinned, scaleless bodies.

**The cat's whiskers:** Catfish get their name from their barbels, which resemble cat whiskers. These sensory organs near their mouth can smell, taste and "see" — allowing the fish to both hunt and navigate in dark and murky waters.

**The cat's out of the bag:** Like spokescat Chester the Cheetah, catfish can't resist Cheetos Puffs, according to those who fish for them. Catfish are attracted to bright colors, like orange. The cheesy corn scent also gets their attention.

**They speak finnish:** Catfish use their pectoral fins (located on their sides behind the gills) to communicate, using specific movements and vibrations. Their inner ears are very sensitive and can detect the slightest vibrations in the water from other catfish nearby.

**You're gonna need a bigger boat:** In 2005, a 9-foot Mekong giant catfish weighing 646 pounds was caught in northern Thailand.

**These "cats" sure got their tongues:** While a catfish's "taste buds" are mostly concentrated in its barbels, gills and mouth, it also has them all over its body, making the fish extraordinarily sensitive to waterborne scents.

**Trawling flat on their face:** The downward-facing mouths and flattened bodies of catfish are perfect for scavenging for food on the bottoms of rivers, lakes and ponds, where they spend most of their time. They have voracious appetites and will eat almost anything: insects, crustaceans, small fish and plants.

**Meowch!** When handling catfish, stay clear of the sharp spines, or "stingers," at the ends of their dorsal (top) and pectoral (side) fins, which can break the skin and cause severe pain, inflammation and possibly infection. For the most part, though, catfish are not aggressive toward humans, except when protecting their nests or young.

**Title image:** *White catfish. (Robert Aguilar/ CC BY 2.0)*

**A** *Yellow bullhead catfish. (U.S. Fish & Wildlife Service)*

**B** *Channel catfish. (U.S. Fish & Wildlife Service)*

**C** *Flathead catfish. (U.S. Fish & Wildlife Service)*

**D** *Brown bullhead catfish. (Kevin Stertz/ CC BY-SA 2.0)*

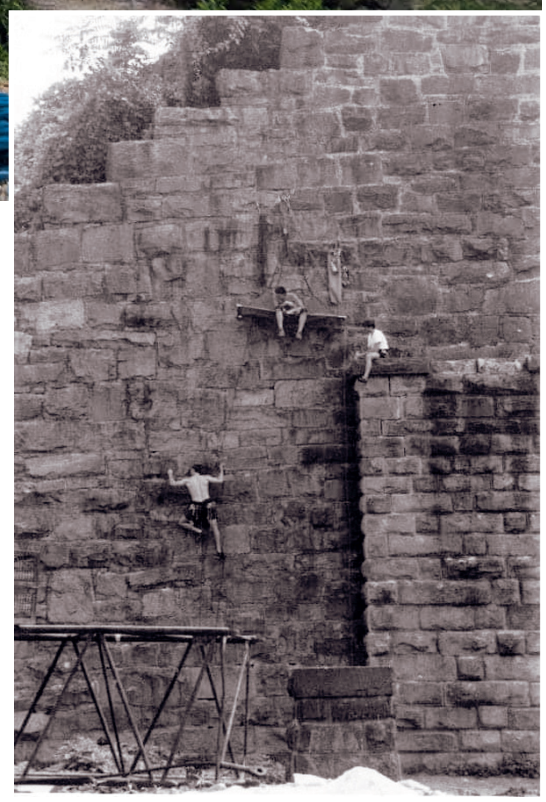
**E** *Blue catfish. (Will Parson/Chesapeake Bay Program)*


## The Bay's barbel-ous catfish

The Chesapeake Bay watershed is home to six catfish species: blue catfish, brown bullhead, channel catfish, flathead catfish, white catfish and yellow bullhead. Can you match them with their descriptions? Answers are on page 32.

1. This invasive species has a yellow/purple-brown mottled body with a rounded tail. Its lower jaw projects beyond the upper jaw of its flattened face. This fish grows 3–4 feet long and can weigh 100-plus pounds. It's found mostly in large, freshwater bodies.
2. This native species lives in freshwater rivers, streams, lakes and ponds, as well as slightly brackish waters. Because it survives in a range of temperatures and oxygen levels, it can be found in polluted waters. This fish can grow about a foot long and has a black to grayish brown mottled body and a dirty white underside. It has a slightly notched tail and dusky barbels.
3. This species is found in the same habitat as the fish in clue 2, although it's less common in brackish water. It grows to about a foot in length and has an olive-brown top that gradually turns yellowish white below. It has a rounded tail and yellowish barbels.
4. This member of the bullhead catfish family is dark, blue-gray on top and white below, with white barbels. Its forked tail has rounded lobes. It grows a bit more than a foot long and weighs up to 6 pounds. This native fish lives in fresh and brackish waters and is tolerant of naturally acidic conditions.
5. This large, aggressive, invasive catfish can grow up to 5 feet long and can weigh more than 100 pounds. It tolerates a range of salinities. It is rapidly multiplying and now found in almost every major Chesapeake river. It eats vegetation, crustaceans, worms and other fish.
6. This bluish/greenish-gray fish (usually with dark spots) and a deeply forked tail is North America's most abundant catfish species. While it can grow 4 feet long, this fish typically averages 1–2 feet. It's found in fresh and brackish rivers. While not native to the Bay region, it is not considered invasive because it is not known to harm native species.

*Columnist Kathleen A. Gaskell served as the Bay Journal copy editor for more than 30 years until her retirement.*



# Climb a piece of history at Richmond's Manchester Wall

**By Lauren Hines-Acosta**

Rob Carter and his friends were scaling a trestle bridge on the north side of the James River in Richmond one day in 1983. As he looked across the river and its rapids, he saw a triangular structure. There had been whispers of a climbing spot over there, but few investigated.

The group made the trek. Hidden under a thick layer of kudzu, "there was this amazing structure of rock," Carter said. "It was just this blank wall, and we found it, and so we decided we'd do something about it."

The Manchester Climbing Wall is now a must-see destination for climbers throughout Virginia. But it took a community of curious climbers to turn the Civil War relic into a community resource.

Experienced climbers know to visit in the afternoon, when the 60-foot wall offers shade from the sometimes-brutal sun. It features modern bolts throughout the wall and 40 routes ranging in difficulty. There are also two smaller structures where climbers can practice setting up and removing gear.

The wall is made of granite quarried from the James River in the early 1800s. Some of the mortar between the rocks has crumbled away, leaving cracks for climbers to get a good grip.

The wall is at the southern end of the T. Tyler Potterfield Memorial [pedestrian] Bridge, and it's the closest outdoor climbing spot for central Virginians. It doesn't require miles of hiking to access, so many people visit on weekdays after work.

"That's why it's such an amazing resource — because there really is no place else [nearby]," said Tom Cecil, owner of Seneca Rocks Mountain Guides. "And having that bolted sport climbing area that no one has to pay to go to is really amazing."

More than 150 years ago, the wall was part of the Richmond and Petersburg Railroad bridge. The Virginia General Assembly chartered the bridge in 1836, and it was completed in 1838. By 1861, Confederate General Robert E. Lee used the railroad to shift troops between the cities to fight Union threats.

*Top photo: A group of climbers from Virginia Beach scale the Manchester Climbing Wall in Richmond. (Lauren Hines-Acosta)*

*Inset photo: A 1994 photo shows climbers on what was then known only as the Richmond and Petersburg Railroad bridge. (Kevin White)*

*An 1865 photo shows Richmond ruins and, in the background, the remains of the Richmond and Petersburg Railroad bridge over the James River. (Alexander Gardner/Library of Congress)*

The bridge burned down four years later when the Confederates evacuated Richmond. It was rebuilt the next year but burned down again in 1882 after sparks from a passing train ignited the supporting wooden beams. After surviving two fires, the granite foundations were forgotten, and a different bridge was built.

It wasn't until the early 1980s that the old foundations received any attention. At the time, rock climbing was more of a counterculture or fringe sport, according to Sam King, head of instruction and adaptive climbing at Peak Experiences. Back then, he said, the climbing lifestyle could look like people spending all they had on gear and living out of their cars just to climb.

Kevin White remembers when climbing the wall back in the late 1980s when he was about 16 years old.

"I would walk from my house down there with two 70-meter coils over my shoulder and … we would very, very frequently get strange looks from people, people asking us what we were doing," White said. "… After a while, they realized we weren't going out to vandalize something. We were actually just going out to climb things."

By the 1980s and 1990s, climbers increasingly covered the wall.

"There was this desire for folks to be outside more, and we saw the first sort of rumblings of a green movement of folks wanting to reclaim some of these industrial spaces as green space," Josh Stutz said, executive director of the Friends of the James River Park.

By 2017, the city adopted the wall and made it part of Richmond's largest park, the James River Park System. The city replaced the bolts installed by Rob Carter and other climbers with new ones placed in a grid to reduce accidents. The James River Outdoor Coalition, the James River Park System and Department of Parks and Recreation maintain the wall.

Now the wall sees visitors from throughout the state. A group of women were climbing the wall on June 29 after driving up from Virginia Beach. They were swaddled in lush foliage as cars passed on the nearby highway bridge.

"Climbing!" called Paige Agnew, resuming movement halfway up the wall.

"Climb on!" answered Kasey Choice, her belayer on the ground, ready to help if needed.

Agnew said she likes climbing because the community is "usually warm and accepting." They offered water and fruit to help others at the wall cope with the hot day.

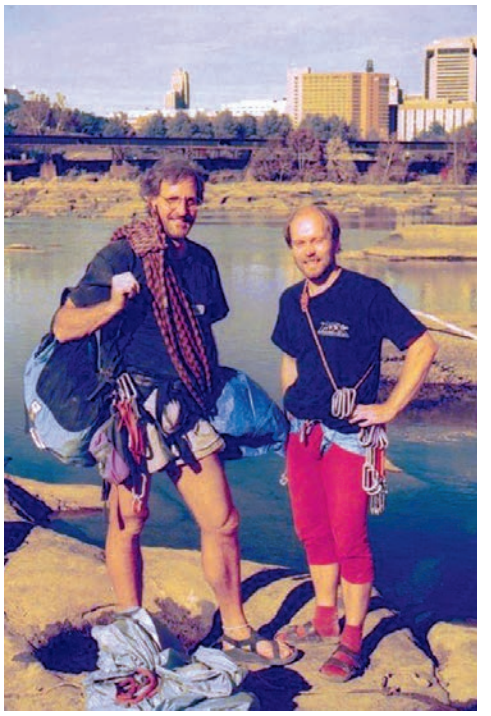
She and other climbers said the sport requires problem-solving, body mindfulness and trust.

"There's not many other sports that you play where you constantly trust your life to another person [like] when you tie into a rope and you're climbing with someone," Sam King said. "So, I think it builds an aspect of trust, and the community that I've experienced since I've gotten into climbing has been incredibly inviting and just encouraging and has really changed my life."

Rob Carter said the wall is now tamed and not the wild place he remembers.

"Manchester Wall is so incredibly special … and I think the new climbers there don't really understand the importance of the Manchester Wall and how it has affected the climbing community," Carter said.

Many people may not know the wall's history, but anyone can enjoy the results from what a handful of curious climbers started over 40 years ago. ■



*A 1994 photo of Rob Carter (left) and Pitt Stuckë at the wall with their climbing gear. (Kevin White)*

## IF YOU GO

The Manchester Wall is at the southern end of the T. Tyler Potterfield Memorial Bridge on the James River in Richmond. It is open from dusk to dawn. Park at the Belle Isle parking lot and walk across the bridge or at the Floodwall Trail rear parking lot by Manchester Bridge.

If you are new to climbing, first seek indoor practice locations or go with a guide. In Richmond, Peak Experiences, Triangle Rock Club, RVA Climbs, RVA Paddle Sports offer guides and classes. Virginia Commonwealth University students, staff and community members can register for climbing trips and rent equipment through the VCU Outdoor Adventure Program.

Climbers must bring their own gear, which usually costs under $250. In Richmond, discounted used gear can be found at Trail Hut.

## OTHER CLIMBING LOCATIONS IN THE BAY REGION

### Virginia

Shenandoah National Park has many climbing spots including **Old Rag Mountain**, which reaches 3,284 feet. Parking is available, but there is a park entrance fee.

### Maryland

**Rocks State Park**, 40 minutes north of Baltimore, has three main climbing areas. Two parking lots are available. Visitors must hike in. The highest point is 374 feet.

**Carderock Park** in Montgomery County features a climb on the Wissahickon schist rock. A parking lot is available. Visitors must hike in. The highest point is 50 feet.

The **Harper's Ferry** area includes climbing spots in all three states (Maryland, Virginia and West Virginia). Maryland Heights is the tallest cliff in central Maryland at 200 feet. Some parking areas require a $20 fee.

### Pennsylvania

**Safe Harbor** is in Lancaster County and the closest campground is the Pequea Creek Campground. Visitors can access the cliffs from the north and the south, but both require hiking in. The highest point reaches 194 feet.

**Chickies Rock County Park** has cliffs on the east bank of the Susquehanna River. The highest point reaches 258 feet.

**Birdsboro Quarry** is in Birdsboro, PA. Camping is allowed for events, but campers must send a request to the Birdsboro Municipal Authority at other times. The highest point for the main wall is 300 feet.

***For more information and other climbing spots, visit mountainproject.com.***

*Photo above: Recreational climber Paige Agnew ascends the Manchester Climbing Wall as Kasey Choice feeds her rope. (Lauren Hines-Acosta)*

# Here be sea monsters: We have met Chessie and ... is it us?


**By Tom Horton**

*What would an ocean be without a monster lurking in the dark? It would be like sleep without dreams.*

— filmmaker Werner Herzog

I don't believe in ghosts and I'm not sure about an afterlife, but I devoutly, absolutely believed in sea monsters. For a moment.

My encounter with the monster happened one crystalline autumn afternoon, kayaking in a steep chop on the broad, lower Nanticoke River.

I was looking west, when there emerged from the waves, silhouetted by the glaring, lowering sun, a great, glistening spiny dorsal of … what? Certainly nothing that should exist. Its size and stark boniness far exceeded any sturgeon or shark.

It was about fifty yards off, undulating parallel with my kayak and about as fast. My journalist's brain said get a closer look. My heart said get the hell ashore.

I paddled hard for the riverbank, and if I hadn't taken a quick look back, I'd have spent the last couple of decades swearing that dark mysteries lurk beneath the Chesapeake's surface. But I did look back and, as a swell hoisted my kayak, I could see that that my monster was the magnificent rack of a buck deer. The animal was furiously paddling across the river, and its huge antlers were virtually all that could be seen above the water.

Perhaps the column I'd surely have written about my sea monster experience would have rekindled Chessie, the sea monster phenomenon whose numerous sightings swept through the Chesapeake Bay area during the 1970s and 1980s.


*Eric Cheezum's 2024 book explores sightings of a Chesapeake Bay sea monster as a cultural phenomenon. (Johns Hopkins University Press)*

No matter, because Chessie has just re-emerged in a worthy new book by historian and Eastern Shore native Eric Cheezum: *Chessie: A Cultural History of the Chesapeake Bay Sea Monster* (Johns Hopkins University Press, 2024).

Cheezum's not out to prove or disprove Chessie. Indeed, I suspect he'd rather not. He's more intrigued by the "why" of all those sightings. His book sketches the enduring hold on our imaginations of "cryptids," creatures unproven by science — from Yeti and Bigfoot, vampires and werewolves, to Nessie of Loch Ness and Champ of Lake Champlain.

He thinks it no coincidence that the emergence of Chessie occurred during a period of rapid cultural transition around the Chesapeake's long edges of land and water. The region was developing, changing rapidly from rural to suburban, from working watermen and commerce to recreational pursuits, environmentalism, tourism and waterfront real estate for sale.

Chessie emerged first during the hot summer of 1978, something 15 feet long, serpentlike, observed on the Virginia side of the Potomac River by a retired CIA agent living on the Northern Neck.

After that, it made its way to Maryland, making appearances in the Choptank, Wye and Miles rivers, among others. Almost exclusively, the creature, assuming various forms, was reported by recreationists, not watermen who actually spent their lives on the Chesapeake.

A notable sighting came in 1980 when Trudy Guthrie made a sketch. She was schooled in science, daughter of Reg Truitt, founder of Maryland's first Bay research laboratory. She thought it "very likely explainable … but not indigenous."

Kent Island, fast filling up with newcomers, would become Chessie central, with a local paper there styling itself the Chessie publication of record. From there would come the first video of Chessie, four minutes of grainy film shot by an amateur from 200 yards. The film riveted the world's cryptid community. Any number of expert analyses followed, including a computer enhanced image from the Johns Hopkins Applied Physics Lab.

"Pretty blurry" was a typical comment. Also "like four kids swimming inside a plastic bag." From the physics lab: "likely an animate object."

The real monster, Cheezum opines, may have been the rapid development that was swallowing Kent Island and its traditional ways of life.

Chessie itself was a friendly monster, inspiring wonder, not fear. It became the stuff of tv shows, newspaper columns and T-shirts, adopted as a Bay ambassador by groups as diverse as the Maryland Watermens Association and the Chesapeake Bay Foundation — a Bay spokesmonster, if you will.

In a stroke of genius, the Annapolis office of the U.S. Fish and Wildlife Service produced a Chessie coloring book aimed at kids, promoting the ongoing Bay recovery effort. They ultimately circulated more than 150,000 books, second only to James Michener's *Chesapeake*, which was published the year Chessie was first sighted.

There's a wonderful section in the book devoted to efforts by the Maryland legislature in the 1980s to afford Chessie "protection" via a joint resolution.

"How can I vote for something we can't see?" one legislator asked. "You can't see God, but you believe," a Chessie supporter answered. The hearing went south after a legislator asked, "What does that thing eat?"

"I bet it eats rockfish," said Sen. James Clark, one of the General Assembly's most esteemed voices. At that time, Maryland was close to placing an historic moratorium on fishing for the beleaguered striped bass. Maybe extermination, not protection was in order, said someone.

By the 1990s, Chessie sightings had faded, though requests for appearances by a costumed Chessie who worked for the U.S. Fish and Wildlife Service would remain strong for years.

As waters have warmed, sightings of manatees wandering up from southern climes have become more common. A manatee is what Trudy Guthrie's 1980 sketch resembled.

Many other things could explain Chessie sightings: a boat wake that appears out of nowhere on calm waters, from a far-off ship, a sturgeon (which can reach 14 feet), a floating log, a deer.

Could Chessie reappear? Cheezum can't say. But if it does, he'd suggest we look more at what is happening with those who live on the Bay's edges than in the water itself. ■

*Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books. He lives in Salisbury, where he is also a professor of Environmental Studies at Salisbury University.*

# For Chesapeake Bay's TMDL: Don't shift, innovate

**By Donald Boesch**

In 2010, the U.S. Environmental Protection Agency determined the total maximum daily loads (TMDL) of nutrient pollutants allowed to be discharged into the Chesapeake Bay and its tributaries. We're not there yet, and the Chesapeake Bay Program — the state-federal partnership that leads the restoration effort — has acknowledged that sufficient measures won't be in place by 2025, as committed to in the 2014 Chesapeake Bay Watershed Agreement.

In 2023, the Bay Program's Scientific and Technical Advisory Committee issued an important report assessing deficiencies in the implementation of pollutant reduction efforts and achievement of water quality outcomes. STAC's Comprehensive Evaluation of System Response, or CESR, includes several key recommendations that I wholeheartedly support.

Funding for alleviating nutrient pollution from agriculture should be redirected from practice- to performance-based approaches. Efforts should target regions disproportionately contributing to pollutant loads. Living resources can be enhanced by improving shallow-water habitats and efficiently managing harvests. I have long advocated for more active adaptive management that also addresses climate change.

However, I am concerned about the CESR recommendation for a tiered approach to achieving the TMDL that would postpone the pollution reduction work required to improve dissolved oxygen conditions in deeper waters of the estuary. The ramifications of redirecting resources to reduce nutrient pollution directly into shallow habitats, as part of a "shifting to the shallows" strategy, require careful evaluation.

Dissolved oxygen standards for deep channel segments of the mainstem Bay are the most difficult to meet. However, giving up on them because few fish or shellfish live there fails to account for the broader ecosystem benefits of reducing the volume, severity and duration of severe oxygen depletion, or hypoxia. These benefits extend throughout the water column, even into shallow waters.

*A forested buffer helps reduce runoff from a farm field along Maryland's Choptank River. (Dave Harp)*

Hypoxia in bottom waters creates a vicious circle by disrupting the biological and chemical processes that remove excess nitrogen (denitrification) and sequester phosphorus in bottom sediments. More of these nutrients are recycled back into the water column, stimulating more algal blooms. As nutrient pollution declines, improvements in water quality are modest initially until a threshold is reached and the circle is broken. We need to be patient, as we can expect increasing rather than diminishing returns as pollutant loads are further reduced.

The volume and geographic extent of hypoxia have declined. Reductions in nitrogen pollution loads, largely as a result of better wastewater treatment and less atmospheric deposition, are the reason. Without these reductions, hypoxia would now be substantially larger, extend farther down the Bay and last longer. Concentrations of ammonia, a tell-tale byproduct of the vicious circle, are declining. There's no reason to throw in the towel on further shrinking the "dead zone."

Without further alleviation of hypoxia, improvements in water quality of shallow habitats in the lower reaches of the tributaries will be limited. Flood tides import those recycled nutrients from the open Bay. For example, numerical models indicate that even if nutrient inputs from the Chester River watershed were halved, hypoxic conditions would persist in the lower river until oxygen concentrations in the mainstem Bay improve. It's a pipe dream to think that we can restore Bay water quality by starting from its tidal creeks and shorelines.

There's no evidence that legal requirements for achieving TMDL water quality goals, as some people claim, have diverted attention from other means of improving living resources under the Watershed Agreement. The outcome for oyster reef restoration in ten tributaries will actually be exceeded by 2025. Progress toward goals for planting forested stream buffers and restoring wetlands, both of which benefit living resources as well as water quality, is "off course." But blaming these failures on pollution reduction efforts seems like a "dog ate my homework" excuse.

Finally, it's unrealistic to expect that resources dedicated to reducing upstream nutrient pollution could be fungibly "shifted," even temporarily, across states and programs to focus on small catchments surrounding shallow estuarine habitats.

Integration of habitat rehabilitation and pollution controls within small watersheds, as suggested in CESR and authorized under Maryland's new Whole Watershed Act, can provide local benefits and promote adaptive learning. However, pilot projects encouraging regional innovation in pollution control will take a decade or more to produce results. Then we face the daunting task of scaling them up to meet Baywide water quality goals.

As we wait for such results, we should recommit to finally completing the existing commitment for nutrient load reductions within a decade. This will require systemic reforms in reducing nutrient pollution from both agricultural and developed lands. By incorporating targeting and performance-based approaches, reforms must verifiably reduce inputs of nutrients delivered to the Bay.

Measures could include restricting the application of fertilizers in regions of high nutrient loss to slightly below the economic optimum rate, as was done effectively in Denmark. There could be limits on the number of animals that can be produced in areas that experience substantial nutrient imbalances, as was done in the Netherlands. Measures should include more stringent stormwater permits and restrictions on sprawling development.

We can achieve the goals for forested streamside buffers and wetlands. We can be smart and forward-looking by addressing the climate crisis and Bay rehabilitation in concert. This requires not only managing the Bay for adaptive resilience, but also finding ways to reduce water pollution as we eliminate net greenhouse gas emissions by mid-century. Opportunities, as well as threats, lie ahead. ■

*Donald Boesch, president emeritus of the University of Maryland Center for Environmental Science, has conducted and managed research on the Chesapeake Bay for 46 years. He is a member of the Bay Journal's Board of Directors but has no role in content oversight.*

# Letters to the Editor


*The Chesapeake Bay watershed is home to more than 18 million people. (Dave Harp)*

## Don't ignore population growth

I would like to thank Ann Swanson, the recently retired director of the Chesapeake Bay Commission, for keeping the most basic of all environmental issues before us: population growth. In her parting comments, Ann spoke of her 35 years of Bay work: "In the time we cut the pollution load by a third, the population grew by half."

Addressing this problem is fundamental to saving the Bay. Since 1980, according to the Chesapeake Bay Program, the population of the Bay watershed has gone from 12.7 million to well over 18 million — with more to come. It has become clear over the years that overpopulation is a primary reason for Bay environmental degradation.

Karl Blankenship wrote in the December *Bay Journal* how efforts of the Bay partnership have "often struggled to mitigate the negative impacts of a rapidly growing population." Rich Batiuk, the former associate director of science, analysis and implementation at the EPA's Chesapeake Bay Program office, was quoted in that same article saying that the program has still been a success "against the backdrop of almost a 60% increase in human population."

But success in the coming years will be more and more difficult if we do not address the continuing population growth, starting now.

If we want to get to the root causes of the Bay's environmental problems, we can't ignore overpopulation. A study should be commissioned to calculate the impacts and consider solutions.

*Bill Tanger, Conservation Chair*
*Float Fishermen of Virginia*

## Preserve existing stream buffers

In "Will a focus on stream health help boost the Chesapeake?" (*Bay Journal*, June 2024) writer Karl Blankenship describes important efforts to engage farmers in planting streamside trees to slow stormwater runoff, retain sediment, slow erosion and keep animal feces from the water. There are additional elements to the stream health equation, though. One that's missing in this article is preservation of existing buffers: For healthy streams, we need to both improve buffers on ag land and preserve those on privately owned land slated for development.

In Harford County, MD, for example, a coalition of nonprofit organizations and neighborhood associations called the Save Abingdon Woods Coalition has been struggling since 2019 to prevent Harford Investors from building 2.5 million square feet of warehouse/e-commerce facilities on a 326-acre tract of forested wetlands called Abingdon Woods, which is in the watershed of Otter Point Creek and the Bush River.

Thanks to pro-bono legal representation from the Chesapeake Bay Foundation and Chesapeake Legal Alliance, we have held off this development project … so far. The owner is still not willing to discuss preservation of this forest. We need new legal tools, such as a state ban on including forested land in county or state "enterprise zones."

We can't only plant tree buffers. We must do more to preserve buffers that already exist.

*Tracey Waite, Chair*
*Save Abingdon Woods Coalition*

## Marshes lost to development

I am surprised at how little marsh exists in the northern Chesapeake Bay. The area is overdeveloped. It looks nothing like the Delaware Bay estuary along Delaware and New Jersey. I have literally seen people's backyards and businesses back right up to the water in the northern sections of the Chesapeake. It's very sad. I doubt if that can ever be reversed, but tougher measures should be taken to stop development at the expense of wetlands and marshes.

*Blair Sulak, Cochranville, PA*

## Global warming & the Bay restoration

We need to rethink goals for restoring the Chesapeake Bay because several goals have not been met despite 41 years of effort.

I suggest that this should include consideration of warming Bay waters, sea level rise and invasive species. These forces are changing the physical and biological structure of the Bay. Ecological change and evolution carry on as they have for thousands of years. But the area covered by the Bay is spreading. Serious effects include inundation of sewage facilities, flooded septic fields, saltwater intrusion of aquifers and detritus from abandoned areas of town and country.

Don't count on the global effort to reverse atmospheric warming to succeed anytime soon. Resistance to reducing greenhouse gas emissions is strong. On Maryland's Eastern Shore, it is not a politically important issue except for denial. For example, U.S. House Representative Andy Harris, whose district covers a large area of Bay shoreline, led a public hearing to oppose construction of an offshore wind farm. No mention was made that the wind farm was needed to reduce use of fossil fuels and keep Ocean City from inundation by the sea.

Bay restoration programs are not geared to reduce greenhouse gas emissions, even though global warming is an obstacle to restoration success. Administrators and the public need to be aware of this. To increase public awareness, the *Bay Journal* could publish detailed maps of areas of critical concern that show the spread of Bay water over time and charts of relative sea level rise over time as recorded by bay area tidal gauges — a kind of score card.

*Thomas Geary, Tilghman, MD*

### SHARE YOUR THOUGHTS

The *Bay Journal* welcomes comments on environmental issues in the Chesapeake Bay region.

Letters to the editor should be 300 words or less. Submit your letter online at *bayjournal.com* by following a link in the Opinion section, or use the contact information below.

Opinion columns are typically a maximum of 900 words and must be arranged in advance. Deadlines and space availability vary. Text may be edited for clarity or length.

Contact T. F. Sayles at 410-746-0519, *tsayles@bayjournal.com* or P.O. Box 300, Mayo, MD 21106. Please include your phone number and/or email address.

*Covered in flower pollen, a bee unwittingly does plant-propogating duty. (Dave Harp)*

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*See* **DONORS**, *page 34*

*Racing dinghies from the Annapolis Yacht Club jockey for position at the mouth of Spa Creek in Annapolis. (Michele Danoff)*

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*Great egrets tiptoe through the flowers at the Conejohela Flats Birding Area along the Susquehanna River near Wrightsville, PA. (Dave Harp)*

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# BULLETIN BOARD

## BULLETIN BOARD GETS NEW ADDRESS

The new address for submitting items to Bulletin Board is: bboard@bayjournal.com

## VOLUNTEER OPPORTUNITIES

### WATERSHEDWIDE

**Potomac River watershed cleanups**
Learn about shoreline cleanups in the Potomac River watershed. Info: fergusonfoundation.org. Click on "cleanups."

### PENNSYLVANIA

**Middle Susquehanna volunteers**
The Middle Susquehanna Riverkeeper needs volunteers in these areas:
- *Sentinels:* Keep an eye on local waterways, provide monthly online updates. Web search "Susquehanna sentinels."
- *Water Sampling:* Web search "Susquehanna Riverkeeper survey."
- *The Next Generation:* Many watershed organizations are aging out. Younger people are needed for stream restoration work, litter cleanups. Individuals, families, scouts, church groups welcome.

Info: MiddleSusquehannaRiverkeeper.org/watershed-opportunities.

**Nixon County Park**
Volunteer at Nixon Park in Jacobus. Info: 717-428-1961, NixonCountyPark@YorkCountyPA.gov.
- *Front Desk Greeter:* Ages 18+ can work alone. Families can work as a team.
- *Habitat Action Team:* Volunteers locate, map, monitor, eradicate invasive species; install native plants; monitor hiking trail improvements. Info: supportyourparks.org, select "Volunteer."

**PA Parks & Forests Foundation**
The Pennsylvania Parks and Forests Foundation, a Department of Conservation and Natural Resources partner, helps citizens get involved in parks, forests. Learn about needs, then join or start a friends group. Info: PAparksandforests.org.

**State park, forest projects**
Help with Department of Conservation and Natural Resources projects at state parks and forests: clear & create trails, habitat; repair & install plants, bridges, signs; campground hosts; interpretation programs & hikes; technical engineering, database assistance; forest fire prevention programs; research projects. Web search "PA DCNR conservation volunteers."

### VIRGINIA

**Leopold's Preserve**
The White House Farm Foundation needs help with its conservation corp 8:30–11:30 am Fridays. Ages 13+. Maintain trails, restore habitat, remove invasive plants, clean up trash. Register: leopoldspreserve.com/calendar, click on date. Info: WHfarmfoundation.org.

**Virginia Living Museum**
Virginia Living Museum in Newport News needs volunteers ages 11+ (11–14 w/adult) to work alongside staff. Educate guests, propagate native plants, install exhibits. Some positions have age requirements. Adults must complete background check ($12.50). Financial aid applications available.
Info: volunteer@theVLM.org.

**Become a water quality monitor**
Volunteer with the Izaak Walton League in Prince William County. Info: Rebecca Shoer at 978-578-5238, rshoer@iwla.org. Web search "water quality VA IWLA."
- *Stream Selfies:* Collect trash data, take photos of local stream.
- *Salt Watchers:* Test for excessive road salt in a stream.
- *Check the Chemistry:* Spend 30 minutes at a waterway with materials, downloadable instructions.
- *Stream Critters:* Use app to identify stream inhabitants.
- *Monitor Macros:* Become a certified Save Our Streams monitor. Learn to ID aquatic macroinvertebrates, assess habitat, report findings, take action to improve water quality.

**Pond cleanup programs**
Join a Prince William Soil & Water Conservation District one-time pond cleanup in fall or spring. Kayaks needed. Info: waterquality@PWswcd.org.

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

**Goose Creek Association**
The Goose Creek Association in Middleburg needs volunteers for stream monitoring & restoration, educational outreach, events, zoning & preservation projects, river cleanups. Info: Holly Geary at 540-687-3073, info@goosecreek.org, goosecreek.org/volunteer.

**Borrow cleanup supplies**
Hampton public libraries have cleanup kits that can be checked out year-round, then returned after a cleanup. Call your local library for details.

### MARYLAND

**Eastern Neck refuge**
Volunteer with Friends of Eastern Neck Wildlife Refuge in Rock Hall. Info: friendsofeasternneck.org.
- *Visitor Contact Station & Gift Shop/Bookstore:* Answer questions, handle sales.
- *Butterfly Garden:* Pairs of volunteers are assigned a plot to plant, weed, maintain spring through fall.
- *Outreach:* Staff information booth at events.

**Bay safety hotline**
Call the Maryland Department of Natural Resources' *Chesapeake Bay Safety and Environmental Hotline* at 877-224-7229 to report fish kills, algal blooms; floating debris posing a navigational hazard; illegal fishing activity; public sewer leak or overflow; oil or hazardous material spill; critical area or wetlands violations.

**Chesapeake Bay Environmental Center**
Volunteer at the Chesapeake Bay Environmental Center in Grasonville a few times a month or more often. Help with educational programs; guide kayak trips & hikes; staff the front desk; maintain trails, landscapes, pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; monitor wood duck boxes; join wildlife initiatives. Participate in fundraising, website development, writing for newsletters, events, developing photo archives, supporting office staff. Info: volunteercoordinator@bayrestoration.org.

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

**Severn River Association**
Volunteer at the Severn River Association.
Visit severnriver.org/get-involved to fill out "volunteer interest" form.

**Annapolis Maritime Museum**
Volunteer at the Annapolis Maritime Museum & Park.
Info: Ryan Linthicum at museum@amaritime.org.

**Lower Shore Land Trust**
The Lower Shore Land Trust in Snow Hill needs help with garden cleanups, administrative support, beehive docents, native plant sale, pollinator garden tour, community events. Info: 410-632-0090, fdeuter@lowershorelandtrust.org.

**Patapsco Valley State Park**
Volunteer opportunities include daily operations, leading hikes & nature crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons, seamstresses.
Info: volunteerpatapsco.DNR@maryland.gov, 410-461-5005.

## Submission Guidelines

**SUBMISSIONS**
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 Bay region.

**DEADLINES**
The ***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 are posted at least two months in advance.
October issue: September 11
November issue: October 11

**FORMAT**
Submissions to ***Bulletin Board*** must be sent as a Word or Pages document or as text in an e-mail. Other formats, including pdfs, Mailchimp or Constant Contact, ***will only be considered if space allows*** and type 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 if 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 bboard@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.

**Answers to CHESAPEAKE CHALLENGE on page 27**

1. Flathead catfish
2. Brown bullhead catfish
3. Yellow bullhead catfish
4. White catfish
5. Blue catfish
6. Channel catfish

# BULLETIN BOARD

### National Wildlife Refuge at Patuxent

Opportunities at the National Wildlife Refuge at Patuxent near Laurel include:

■ *Wildlife Images Bookstore & Nature Shop:* Work a few hours a week, half day or all day 10 am–4 pm Saturdays; 11 am–4 pm Tuesdays–Fridays. Run register, assist customers. Ages 18+ (17 & younger w/parent). Visit the shop in National Wildlife Visitor Center, ask for Ann; email wibookstore@friendsofpatuxent.org.

■ *Kids' Discovery Center:* Help develop curriculum activities or become a docent. Info: Barrie at 301-497-5772.

■ *Monarch Magic:* Adults & ages 16–17 w/adult registration on file. Learn about volunteering with the Monarch Butterfly Team by attending a Monarch Butterfly Team Overview. Info: Barrie 301-497-5772.

### Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation remove invasive plants 10 am–4 pm the second Saturday of every month at Ruth Swann Memorial Park in Bryans 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 am; return at 5 pm. Carpool contact: 301-277-7111.

### Maryland State Parks

Search for volunteer opportunities in state parks at ec.samaritan.com/custom/1528. Click on "search opportunities."

### St. Mary's County museums

St. Mary's County Museum Division needs adults to help with student/group tours, special events, museum store operations at St. Clement's Island Museum or Piney Point Lighthouse Museum & Historic Park. Info: St. Clement's Island Museum, 301-769-2222. Piney Point Lighthouse Museum & Historic Park, 301-994-1471.

## EVENTS / PROGRAMS

### WATERSHEDWIDE

### Chesapeake Watershed forum

Participate in this annual forum hosted by the Alliance for the Chesapeake Bay to inspire action for clean water. Learn about new initiatives, lessons from on-the-ground work, network with others, celebrate successes.
Oct. 18–20. Online only availability. Registration/info: allianceforthebay.org/event/chesapeake-watershed-forum/

### PENNSYLVANIA

### Wild & Uncommon Weekend

York County's annual *Paw Paw Festival* is now a four-day-long *Wild & Uncommon Weekend*, a regional celebration spotlighting the diverse ecosystem of local foods, makers & experiences. From Sept. 26–29 you can partake in Lancaster Conservancy-guided nature hikes, child-friendly farm walks, Susquehanna boat tours, paw paw tastings, products and cooking classes, purchase paw paw trees, merch. Some events require registration. The Pawpaw Festival at Horn Point Farm Sept. 28 requires pre-purchased tickets. Info/tickets: hornfarmcenter.org/pawpawfest/.

### Environmental Education Festival

*Environmental Education, Arts & Music Festival*, 9 am–3 pm Sept. 14, at the Montour Preserve in Danville. Live music, art presentations, kayaking, fossil pit, guided hikes. Info: vernalschool.org.

### VIRGINIA

### Leopold's Preserve Fall Festival

The White House Farm Foundation and the Northern Virginia Conservation Trust's *Fall Festival* at Leopold Preserve celebrates their work & the beauty of fall. 11 am–3 pm Sept. 21, Haymarket. Outreach booths from local environmental organizations, guided hikes, raffles, face painting, food trucks, vendors. Info: leopoldspreserve.com (calendar).

### Northern Neck Land Conservancy Boots & Barbecue

Barbecue buffet, live music & exhibits/demos reflecting the rural character of the Northern Neck. 1–4 pm Sept. 28, Westmoreland County. Proceeds will help to protect working farms, waters, woodlands. Tickets/info: nnconserve.org.

### Let's Go Adventures series

Virginia State Parks' *Let's Go Adventures* series teaches first-time participants the skills to confidently participate in a range of outdoor activities. Learn the basics of each activity, how to select & use proper equipment, Leave No Trace Principles, park etiquette, safety guidelines. Except for kayaking ($15 w/park admission fee), all adventures are free w/park admission fee. Space is limited. To register/learn about upcoming sessions: VirginiaStateParks.gov/lets-go-adventures.

**Let's Go Camping**

■ *Fall Farm Days at Sky Meadows, Delaplane*: 11 am–4 pm Oct. 12; offered on an ongoing basis.

**Let's Go Fly Fishing**

■ *Seven Bends, Woodstock:* 9 am–12 pm & 2–5 pm Sept. 29.

**Let's Go Orienteering**

■ *Widewater State Park, Stafford:* 11 am–1 pm & 2–4 pm Sept. 14 (second session adults only).

■ *Machicomoco State Park, Hayes:* 1:30–3 pm Oct. 6.

**Let's Go on an Archery Adventure**

■ *Widewater State Park, Stafford:* 11 am–1 pm & 2–4 pm Oct. 5 (second session adults only).

■ *Machicomoco State Park, Hayes:* 1–2:30 pm Nov. 9.

### MARYLAND

### Eden Mill Nature Center

Attend an event at Eden Mill in Pylesville. Preregistration required at edenmill.org. Info: edenmillnaturecenter@gmail.com.

■ *Preschool Nature Series:* 10–11 am. Ages 2-5 with/adult. Sept. 17, 18 (Monarch Madness); Sept. 24, 25 (Fintastic Fish); Oct. 1, 2 (Hoo-ray for Owls); Oct. 8, 9 (Camouflage); Oct. 15, 16 (Pumpkin Party). Activities, story, craft, short hike (weather permitting); $11/ per class.

■ *Homeschool Park Quest:* 12:30–1:30 pm Sept. 11, 18, 25. Oct. 2, 9, 16. Ages 6-11. $30 for the month. Research a different National Park each week, discover what we can apply locally while hiking trails, focusing on preparedness, safety.

■ *Star Walk:* 7–9 pm Oct. 12. Ages 8+. $12. Hike with stargazing.

■ *Bird Banding:* 7–11 am. Sept. 8, 21, 28. Oct. 5, 11, 17, 27. Ages 8+. Joe Vangrin Memorial Pavilion, with intermittent walks to check the nets. Dates tentative, weather permitting. Free.

### Youth Fishing

The town of Greensboro's free *Cops & Bobbers Fishing Derby* takes place 9–11 am Sept. 28, followed by Kids in the Park at 12 pm at Choptank River Park. Info: aweaver@greensboromd.com, 410-482-6222.

### Patuxent Research Refuge

Patuxent Research Refuge offers free public programs on its North Tract [N] and South Tract [S] units in Laurel. No registration except where noted. List special accommodation needs when registering: 301-497-5887. Info: 301-497-5772, www.fws.gov/refuge/patuxent-research/visit-us, www.fws.gov/refuge/patuxent-research/events.

■ *Kids' Discovery Center:* 9 am–12 pm (35-minute time slots, on hour) Tuesdays-Saturdays [S]. Ages 3–10 w/adult. Nature exploration; free booklet. September: Water Birds/Ducks & Geese. October: *Spiders: Not as Creepy as You Think!* Group arrangements possible. Registration urged: 301-497-5760 (This number is only for this program.).

■ *"Wingspan" Game Days:* 10 am–1 pm Sept. 13 & 28 (monthly 2nd Fri. & 4th Sat.) [S]. Ages 12+. No experience needed. Play the award-winning board game; learn about birds! Games provided; personal sets welcome. Registration required. Sign in at front desk.

■ *Birding at North Tract:* 8–11 am Sept. 15. Ages 12+. Beginner, advanced birders. Some driving, short easy walks on natural or gravel trails. Meet at North Tract Visitor Info Station. Water, sunscreen, bug spray, snack, binoculars and/or camera recommended. Registration required.

■ *Family Fun:* 9 am–4:30 pm, Tues.–Sat. for drop-in/independent exploration. Staffed, 10 am–1 pm Sept. 20 & 21 [S]. Sept/Oct Theme: Bird Migration. All ages. Hands-on learning activities, games, crafts.

■ *Magical Monarchs & Pollinators—Creating Habitats:* 12:30–3 pm Sept. 28 [S]. All ages. Celebrate with Friends of Patuxent: free native plants & workshop, movie, monarch butterfly releases, arts & crafts. Learn the mysteries of monarch migration; how to invite pollinators to your property. Info: friendsofpatuxent.org.

■ *Cash Lake Walk:* 5:15–6:50 pm Sept. 29; rain/shine [S]. All ages; 18 & younger w/adult. No pets preferred; accepted if leashed. 1.8-mile hike. Meet at wolf statue in front of the Visitor Center. Bring water, binoculars if desired; appropriate footwear for relatively level natural ground; some muddy portions possible.

### Monarchs & Milkweed Festival

Celebrate the monarch butterfly with crafts, games, butterfly tagging, costumes, food trucks. 10 am–2 pm Sept. 28, Merkle Nature Center, Upper Marlboro. Info: 443-510-9920.

## RESOURCES

### MARYLAND

### Fishing report

The Department of Natural Resources' weekly Fishing Report includes fishing conditions across the state, species data, weather, techniques. Read it online or web search "MD DNR fishing report" to sign up for a weekly email report.

### Free pumpout adapter kits

The Department of Natural Resources is offering state boat owners and marinas free adapter kits to help empty holding tanks securely at area pumpout stations. The kit has a plastic adapter that screws into the existing waste discharge deck fitting, instructions, protective gloves, storage tube, QR code to a list of pumpout stations in Maryland. Info: Web search "MD DNR free pumpout kit" or contact Jennifer Jackson at 410-260-8772, pumpouts.dnr@maryland.gov. DNR also offers an online map of pumpout stations (web search "MD online pumpout map") and clean boating tip sheet (web search "MD clean boating").

### VIRGINIA

### Apply for runoff assistance

The Prince William Soil & Water Conservation District no longer requires application periods for the Virginia Conservation Assistance Program, which helps HOAs, homeowners, schools, places of worship and others with urban soil erosion & water runoff. Interested parties can visit pwswcd.org to fill out a request form or contact the district at 571-379-7514, pwswcd.org/vcap, or Nicole Slazinski at nicoleethier@pwswcd.org.

# Paris to the Patapsco: Urban swimming is having a moment


**By Jake Solyst**

This August, urban river swimming was on public display as the world's best athletes raced through the iconic Seine River in Paris as part of the Olympic triathlon. And while the Seine did not perform as well as hoped — with two training days canceled due to poor water quality — any swimming in the river at all gives hope to urban waterways across the world.

French officials have spent roughly $1.5 billion repairing and upgrading the Paris sewer system to keep sewage from flowing into the river during and after rainstorms. Data was collected to show when bacteria levels were low enough for safe swimming. And in June 2024, Paris' intrepid mayor, Anne Hidalgo, swam laps in the river to prove its cleanliness. (It was later reported that bacteria levels were slightly above the safety threshold on that day.)

According to all the riverkeepers I spoke with in the Chesapeake Bay watershed, this is essentially the path to a swimmable river: Spend significant sums of money to reduce sewage overflows and other forms of runoff, set up a monitoring system to determine when bacteria levels are low enough for swimming, and allow public swimming in some form or fashion.

So how are the Chesapeake's major cities doing in this ambitious effort?

Let's start with the gold standard for urban swimming: Richmond. For decades, swimming has been not only legal in Richmond but embedded into the city's ethos. The James River Park System manages seven sites where folks can get into the water and swim. In 2012, *Outside* magazine named Richmond the Best River Town in America. According to Tom Dunlap, riverkeeper with the James River Association, the city has closed nearly 20 potential sewage overflow locations in the last 10 years. The James River Association tests water quality at seven locations in Richmond every Thursday and makes the data available by Friday.

*Harbor Splash participants enjoy a dip in the Baltimore Harbor at Bond Street Wharf in Fells Point on June 23. (Rhiannon Johnston/Chesapeake Bay Program)*

Still, maintaining water quality is a continuing challenge for the city. In July, a major sewage overflow put Richmond under a rare recreational advisory. And, according to Dunlap, the city still has 25 active combined sewage overflow sites that periodically spill into the river when it rains.

"We're still facing issues with water quality that require attention from the state and the federal government," Dunlap said.

In Baltimore, visions of a swimmable Inner Harbor are led primarily by the Baltimore Waterfront Partnership. Weeks before the mayor of Paris swam in the Seine, Baltimore's mayor, Brandon Scott, was doing the same to publicize the city's June 23 Harbor Splash, when more than 150 people went for an organized swim off Bond Street Wharf in Fells Point. During the past several years, Baltimore has invested $1 billion on repairing and upgrading sewer systems, which has reduced sewage overflows by 76%.

The Waterfront Partnership has collected water samples since 2019 and organized the swim event to celebrate the harbor's improvement.

"Eighty percent of the time, the water was safe for recreation," said Adam Lindquist, executive director of the partnership.

In the District of Columbia, the Anacostia Riverkeeper organization has been working to coordinate their own River Splash. Data collected by the Anacostia Watershed Society shows that on certain days bacteria levels are low enough for swimming. According to Anacostia Riverkeeper Trey Sherard, this is largely due to 25 years of major utility upgrades by DC Water and the Washington Suburban Sanitary Commission. The River Splash was canceled twice this summer, however, as untimely storms spiked bacteria levels. (See story, page 7.)

Rain delays notwithstanding, progress occurring in the Anacostia River and Baltimore Harbor might seem enviable to those in Harrisburg. According to Lower Susquehanna Riverkeeper Ted Evgeniadis, Harrisburg suffers weekly sewage overflows that make swimming in the Susquehanna River unsafe.

"All it takes is a drizzle for us to see a [sewage] overflow," Evgeniadis said.

One place in Harrisburg that has the potential for recreational swimming is the beach at the upstream end of City Island, a 63-acre island accessible by car and pedestrian bridges from the downtown riverfront. Evgeniadis said water quality samples in that location are sometimes safe enough for swimming.

Having an urban waterway safe enough for swimming isn't just a perk, riverkeepers and clean water advocates say — it's a public right under the Clean Water Act.

"The health of and access to urban waters has long been neglected," said Kate Fritz, CEO of the Alliance for the Chesapeake Bay. "From burying streams [for development] to converting them into conveyance systems for polluted stormwater or placing dumpsters and trash receptacles [along] their banks, these areas have been marginalized for generations."

Though often a burden, rivers can also be an economic and cultural backbone for Chesapeake cities. In Harrisburg, Evgeniadis said, there is lots of potential for swimming, fishing, kayaking and other forms of outdoor tourism. "You clean up the river and you're going to make more money," he said.

Baltimore City Council member Mark Conway, who attended the Harbor Splash and is the former executive director of the Baltimore Tree Trust, said that a swimmable Baltimore Harbor would elevate an already popular destination.

"We have a world-class aquarium. We have world-class seafood. Why shouldn't we have a world-class harbor where anyone can swim?" Conway said.

Perhaps the most significant benefit of a swimmable river is the connection people make with the water. You don't have to be the mayor of Paris to know that if you can swim in a river, you're more likely to care about it and keep it healthy.

As put by Anacostia Riverkeeper Sherard, "Of all the ways to relate to a body of water, swimming in it is maybe the most complete and profound." ■

*Jake Solyst is the Chesapeake Bay Program web content manager with the Alliance for the Chesapeake Bay.*

# This little heron is everywhere, but good luck spotting one


**By Alonso Abugattas**

It's one of the most widespread heron species on the planet, with at least one of its four subspecies found on every continent except Australia and Antarctica. They are found in every U.S. state, even Alaska and Hawaii. But there's a chance you'll never see one. The reason is right in its name: the black-crowned *night* heron. Even its scientific name — *Nycticorax nycticorax* — is a clue, meaning "night raven."

Sometimes also called the black-*capped* night heron, this bird seems to prefer conducting most of its business at dusk or nighttime for practicality's sake as well as self-preservation: There's less competition for food when it's dark and less of a chance of attacks from other herons or birds, which scientists refer to as "agonistic" behavior. One exception to this pattern is in Hawaii, where black-crowns are known to feed and be otherwise active in the daylight — likely, the theory goes, because they have fewer competitors there.

The black-crown is a stocky, compact, mid-sized heron, measuring 22 to 27 inches from beak to tail and weighing roughly 1.5 to 2 pounds. That's well under half the size and weight, roughly speaking, of the more familiar great blue heron. And, compared with the great blue, it has short legs and a short, thick neck that can look like no neck at all when the bird strikes its standard hunch-backed pose. Juveniles (first and second year) have an overall brownish and streaky appearance, with white spots on their wings. On adults, the "occipital plumes" — one or more long white feathers sprouting from the back of their heads — tend to get longer in breeding season.

In general, they are colonial nesters, usually in trees, sometimes in mixed rookeries with other herons and sometimes only with their own species. They are not shy and may nest near human habitation. Colonies can last for decades.

*A black-crowned night heron stands stock-still at water's edge, waiting for its next meal to swim by. (Gregory Smith/CC BY-SA 2.0)*

One remarkably long-lived colony was at the National Zoo. The only known colony in or near the District of Columbia, it actually preceded the zoo's construction in 1889. And that didn't scare them away; they continued to occupy the area around the zoo's Bird House for over a century, stealing the fish and rodents brought in to feed the captive wetland birds. At one point, there were more than 100 mating pairs that called the zoo home, with as many as 10 nests in some trees. The first time I saw them, I assumed that they, much like other birds there, were captive zoo specimens, but they were wild and would come and go as they wished. Sadly, they relocated after the reconstruction of the Bird House in 2018.

Most night herons start breeding after 3 years, with the male selecting the nesting site, usually in isolated locations such as islands and often over water. The male starts building the nest with sticks and twigs. After he finds a mate, she takes over the building, though the male may still provide the nesting material. They might recycle material from old nests or steal from other herons nesting nearby.

In the spring, before most other heron species start nesting, females lay 3–5 eggs that are green at first but then turn blue. Eggs hatch asynchronously in 24–26 days, with both parents incubating them.

*A vigilant parent watches over its chicks. (Michael Barera/CC BY-SA 4.0)*

The pair have elaborate displays when switching their nesting duties, with calls and the raising of feathers.

The young are extremely noisy and have been known to vomit as a defensive strategy. They compete with one another, and those that hatch first have a distinct advantage. They have been known to kill their siblings, especially when food is scarce. If nest temperatures get too high, the parents may wet the chicks' feathers to keep them cool. After the first couple of weeks, the young leave their nest, hopping around on branches until they're ready to fledge at 6 or 7 weeks.

While black-crowns nest colonially, they ordinarily go solo when foraging. They are opportunistic feeders, known to eat leeches, insects, worms, crayfish, clams, fish, mussels, reptiles, amphibians (especially in the spring), rodents and eggs (particularly those of terns and ibises). While they generally occupy both fresh and saltwater

*A black-crowned night heron in flight. (Irvin Calicut/CC BY-SA 4.0)*

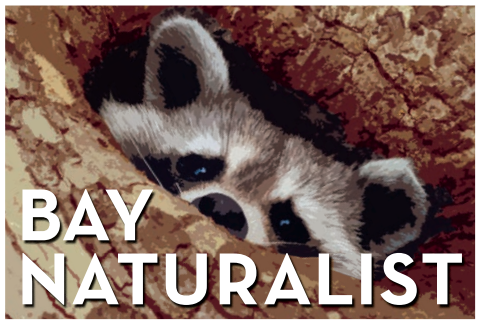
wetlands, they have been known to visit landfills and grasslands.

By mid-August through October, many are ready to migrate. Those at the northern reach of their range migrate the farthest, sometimes ending up in Florida, coastal Mexico, the Caribbean and especially Cuba. Others are essentially year-rounders and migrate only a few miles or a few dozen miles, often toward the coastline. Much depends not only on average winter temperatures, but also on the weather of a given winter. In the Chesapeake Bay region and even as far north as New England, eastern populations may stay put or just move closer to the coast.

Black-crowned night herons are considered a species of least concern, with a total North American population of around 3 million. The population has been generally stable, although there have been localized declines. In Minnesota and Oregon, for instance, numbers began to fall sharply in the 1960s and continued to drop until a few years ago. And, as seen in 2018 at the National Zoo, these birds don't tolerate radical changes to their nesting habitat — but they are eminently adaptable birds. Where food is abundant, and in the absence of predators and disease, a black-crowned night heron can live up to 20 years. The record belongs to a California female that lived for 21 years and 5 months. ■

*Alonso Abugattas, a storyteller and blogger known as the Capital Naturalist, is the natural resources manager for Arlington County (VA) Parks and Recreation. You can follow him on the Capital Naturalist Facebook page and read his blog at capitalnaturalist.blogspot.com.*

# Hats off to the turkey vulture, our carrion custodian




**By Kathy Reshetiloff**

You've probably caught a glimpse of these very large, brownish-black birds, soaring lazily overhead or standing along the road, dining on the latest unfortunate squirrel. They're hard to admire, but they perform this important yet thankless function: They're our outdoor cleaning crew, ridding the landscape of roadkill and other carcasses. This ecological service is even reflected in their scientific name, *Cathartes aura* — which comes to us from ancient Greek, by way of Latin, and means "cleansing wind."

Turkey vultures, known to ride the wind for hours, courtesy of thermals and updrafts, are common in much of the Western Hemisphere, from southernmost Canada to Argentina. Those that summer and breed on the cold edges of that range — in our case, Appalachia and northern Pennsylvania — are migratory. They will begin to head to warmer climes this month and next. Some turkey vultures migrate in flocks while some join up with others en route south.

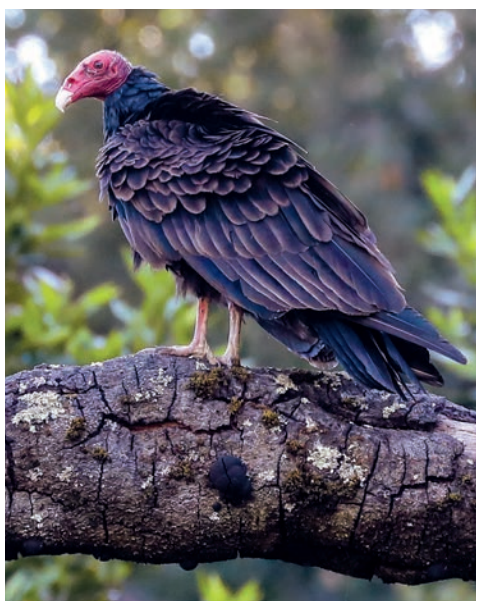
Because of their naked, unfeathered, turkey-like heads and long faces with downward-curving beaks, they are not the most attractive birds. But they are quite graceful to behold in flight, with a wingspan of 6 feet. They are most likely to be found soaring over open or semi-open country, including fields, lightly wooded areas, deserts and foothills. They can soar for hours on updrafts and rising columns of warm air. When soaring, turkey vultures hold their wings slightly raised, giving them a shallow V shape when viewed head-on. They also tend to rock slightly from side to side.

The diet of turkey vultures consists almost entirely of carrion, from fresh to putrid, although they will occasionally feed on decaying vegetation, insects or fish. Efficient scavengers, turkey vultures quickly dispose of carcasses. They can consume the bodies of animals that died of illness or infection without being adversely affected.

*An adult turkey vulture in flight reveals the silvery-white trailing edges of its wings. (Michael L. Baird/CC BY 2.0)*

Outside of breeding season, turkey vultures tend to live in groups known as roosts. They will rest in the large trees as well as sit in trees to sun themselves. Late risers, turkey vultures wait for the sun to warm them. They hurry this process along by standing with their wings slightly spread and drooping, which not only raises their body temperature but also dries whatever moisture might have accumulated overnight.

Since they have no syrinx or voice box, turkey vultures cannot sing like other birds. Instead, they hiss, grunt and huff.



*An adult turkey vulture perches on a branch, distinguishable from a black vulture by its red head and the brown outlines on its wing feathers. (Shelly Prevost/CC BY-NC 2.0)*

*An adult turkey vulture, with a clear view of its featherless red head and sharply hooked beak. (Dennis Church/CC BY-NC-ND 2.0)*

Now on to some of their unsavory habits. If threatened or disturbed, turkey vultures will vomit. There are several explanations as to why they do this. Some believe that predators will be attracted to the regurgitated matter and leave the vulture alone. It may serve to simply distract and confuse a would-be predator. Most believe, however, that it is simply the bird's natural physical response to fright.

Turkey vultures have one more bad habit: They excrete down their legs. There are also theories as to why they do this. One is that because their excrement contains so much ammonium, it helps to kill bacteria. Another is that it cools the skin on their legs and helps regulate the bird's body temperature.

Despite these characteristics, they do have redeeming qualities. Pairs are thought to be monogamous for life, and both parents incubate the eggs, as well as care for and feed the young. Males and females are similar in appearance, though females are typically somewhat larger.

Nest sites consist of little or no nest at all — eggs are laid on debris inside a hollow tree or log, in crevices on cliffs and in caves, dense thickets or old buildings. The only thing most nests have in common is that they tend to be well hidden from humans. According to the Cornell Lab of Ornithology, breeding pairs in our middle latitudes ordinarily begin laying eggs in April — earlier to the south and later to the north. A pair usually produces two eggs, occasionally one and rarely three. The eggs are off-white and splotched with a variety of colors, mostly on the blunt end. Incubation lasts 34–41 days.

Young are born with a coat of down and eyes open, but they must be fed by regurgitating parents. If the nest is disturbed, the parents will protect it by violent vomiting. Immature turkey vultures look similar to their parents except that they have black or dark gray heads and black beaks. The young can fly at about 9–10 weeks old. The beaks turn to white or ivory by the age of 4.

It can be tricky to tell a turkey vulture from the slightly smaller but otherwise similar black vulture (*Coragyps atratus*). Up close, the most apparent difference is the head color: red on an adult turkey vulture but gray on the black vulture. As its name suggests, the black vulture is also more or less pure black, while the turkey vulture has brownish tones, particularly on its wings. In flight, viewed from below and in bright light, the entire trailing edge of the turkey vulture's outstretched wing is silvery-white, while the undersides of the black vulture's wings are solid black with silvery-white only at the outer tips.

Though they might not be on your list of favorite birds, turkey vultures help to remove carcasses quickly. With an increase in development comes an increase in roadkills. Scavengers like turkey vultures keep the surrounding environment clear of unsightly and decaying animal bodies. So remember when you see one circling overhead: Without vultures, every day would be like a garbage-collection strike. ■

*Kathy Reshetiloff works for the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office in Annapolis.*