

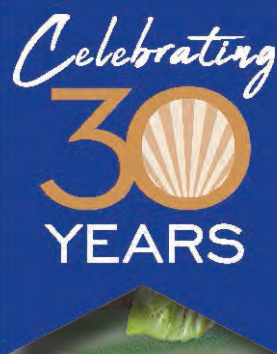
CHESAPEAKE

# BAY JOURNAL

January - February 2022

Volume 31 Number 10

Independent environmental news for the Chesapeake region



## Can beavers help build a better Chesapeake Bay?

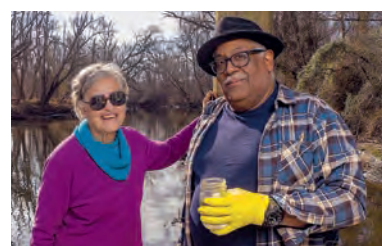
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### NEW BAY CLEANUP PLAN



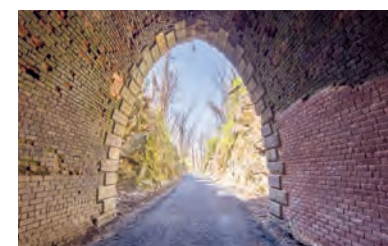
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Members dropped from state commission **PAGE 16**

### TAKE ON A TUNNEL



A flashlight hike through the Blue Ridge Tunnel **PAGE 34**

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Researcher Matthew Gray of the University of Maryland Center for Environmental Science participated in a study of densely populated oyster reefs in Florida and found evidence that they help to improve water quality. Read the article on page 26. (Dave Harp)

ON THE COVER

A beaver gathers building materials in Frederick County, MD. (Dave Harp)  
Bottom photos: Left and center by Dave Harp, right courtesy of Nelson County, VA/Jack Looney Photography

CORRECTION

In the December issue, the article about Pennsylvania’s nutrient reduction progress should have stated that the region had reduced the amount of nitrogen reaching the Bay by about 40% since 2009, leaving 60% of the work to be accomplished in just five years. The article incorrectly stated that the region had reduced the amount of nitrogen by 29%. The Bay Journal regrets the error.

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EDITOR’S NOTE



The power of persistence

There’s a small rock on my desk. (Actually there are several rocks, but for now I’ll focus on this one.) I found it in Western Maryland many years ago. It’s roughly the shape of a flattened chicken egg, about an inch thick. Near the center of one side is a hole, almost perfectly round, the size of a dime. The hollow goes about a quarter-inch deep, then turns and widens.

I’ve kept that rock because, to me, its tiny cavity is a symbol of unflagging, unrecognized persistence. I don’t know for sure what created the hole, but I suspect it was water. One slow drip at a time. Pausing and recharging. In one place. For years. A small liquid force against rock. I know this process occurs on a much larger scale, carving mountain gaps and forging caves. But this compact demonstration, which fits nicely in the palm of my hand, continues to inspire: a testimony to the power of persistence.

In this issue of the *Bay Journal*, you’ll encounter its human form. Scientists and biologists engaged in a momentous struggle to restore the Chesapeake Bay. Tireless volunteers sustaining fish habitat over decades. The aims and frustrations of people who, with varied perspectives, are united by a goal to revive oyster beds. Lawmakers and advocates across the region edging their way forward on environmental policies and conservation goals, sometimes with success, sometimes losing ground and trying again.

All of these people push against rocks. They pause, recharge and keep going.

Finding our way toward a more sustainable existence with nature is, to put it mildly, hard work. It takes patience, persistence, passion and more time than we’d like. But it’s good to remember that, eventually, drops of water can carve a hole in a rock. The *Bay Journal* is here to help document and inspire your work.

— Lara Lutz



## BY THE numbers

**270,000**

Acres of forest lost in the Chesapeake Bay watershed from 2014 to 2018

**25,000**

Average number of acres of new urban development taking place in the Bay watershed each year

**2.52**

In degrees, the average temperature increase in freshwater streams in the Bay watershed from 1960 to 2010

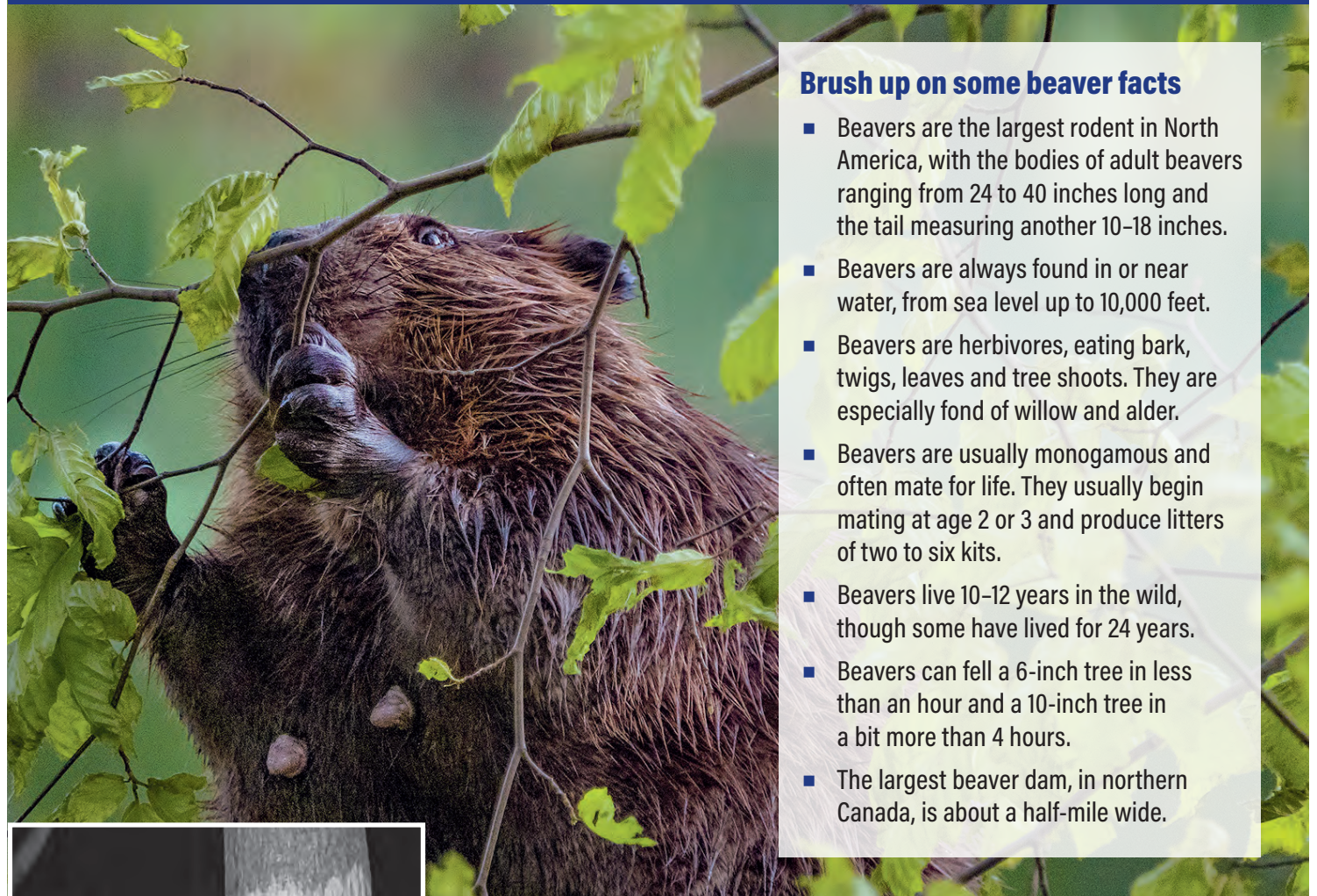
**3.4**

In miles, the width of the Bay near its northernmost point by Aberdeen, MD

**35**

In miles, the width of the Bay at its widest point near the mouth of the Potomac River

## Beavers: Wild engineers for stream systems



### Brush up on some beaver facts

- Beavers are the largest rodent in North America, with the bodies of adult beavers ranging from 24 to 40 inches long and the tail measuring another 10–18 inches.
- Beavers are always found in or near water, from sea level up to 10,000 feet.
- Beavers are herbivores, eating bark, twigs, leaves and tree shoots. They are especially fond of willow and alder.
- Beavers are usually monogamous and often mate for life. They usually begin mating at age 2 or 3 and produce litters of two to six kits.
- Beavers live 10–12 years in the wild, though some have lived for 24 years.
- Beavers can fell a 6-inch tree in less than an hour and a 10-inch tree in a bit more than 4 hours.
- The largest beaver dam, in northern Canada, is about a half-mile wide.

Beavers have been called the “quintessential riparian animal” because of their influence on streams and wetlands. They are considered keystone species because their dam-building activity alters stream systems in ways that create productive, nutrient-rich ponds and wetlands that provide habitat for many birds, amphibians, reptiles, plants and fish. Beaver impoundments and the variety of habitats they create often outlive the dams themselves.

The fact that beavers have come to be viewed as a nuisance largely reflects the degree to which humans encroached upon riparian or streamside ecosystems after beavers were largely eliminated from the landscape by trappers.

(Dave Harp)

## LOOKING BACK



### 30 years ago

#### Bay states criticize proposed changes to wetland rules

Maryland, Virginia and Pennsylvania strongly objected to proposed changes in a federal manual used to identify wetlands that may be protected from development, saying it would remove huge areas from regulation. ■

— Bay Journal, January 1992

### 20 years ago

#### Executive Council says economy shouldn't hinder Bay cleanup

Despite looming budget shortfalls at the state and federal levels, leaders of the Bay cleanup called for new spending to help meet restoration goals outlined in their *Chesapeake 2000 Agreement*. ■

— Bay Journal, January 2002

### 10 years ago

#### VA's South River runs free for first time in 100 years

The removal of a century-old dam, located in Waynesboro, VA, opened the river for migrating fish and eels, helped cool the water to improve trout habitat and created more potential for recreational paddling. ■

— Bay Journal, January 2012



# 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 well over 200,000 people each month through news articles, columns, films and the *Chesapeake Uncharted* podcast.

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## STAFF

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

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**opinion columns:**  
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**editor:**  
llutz@bayjournal.com or 410-798-9925

# BAY JOURNAL NOTEBOOK



*Bay Journal photographer Dave Harp caught this aerial image of pig tracks at a small farm on Maryland's Eastern Shore during a recent snowfall. (Dave Harp)*

## Thanks for the many ways you say ‘thank you’

One of the great pleasures of working at the *Bay Journal* is receiving feedback from you, our readers, who often send notes to say thanks, praise an article or ask a question. Sometimes you let us know how you learned about the *Bay Journal* and the ways in which you share it with friends, coworkers, family and students. We can't thank you enough!

During the past month, many of those notes accompanied donations that support our work. Because Bay Journal Media is a nonprofit news organization, those gifts are critical in helping us produce and distribute independent environmental news throughout (and sometimes beyond) the Chesapeake region. Thanks so much to all of you who contributed. And, remember, you can always help by introducing the *Bay Journal* to someone new.

Speaking of feedback, you may know that in July 2020 we debuted our podcast, *Chesapeake Uncharted*, produced and hosted by staff writer **Jeremy Cox**. We devoted the entire first season to climate change — how it's happening, here and now, in the Bay region. With the last episode dropping this month, we just wanted to say this about the response: Wow! We've heard from listeners who love getting the same quality of reporting they expect from the *Bay Journal* in a whole new medium. Some of the most satisfying feedback has come from scientific experts who have praised the breadth and saliency of the issues discussed. We look forward to bringing you more in season two.

Meanwhile, Jeremy and the rest of our staff have been out and about as much as possible, given the dynamics of COVID-19. On a mild day, **Whitney Pipkin** paddled to Minnie's Island in the Potomac River to report on a project taking place there. She learned that a local reporter recently used the island's small, rustic cabin as a retreat while writing his book, and Whitney is busy thinking up book ideas for an excuse to return. Photographer **Dave Harp** headed out with his camera as soon as the snow started to fall in January and captured some stunning scenes, like the one above. It's an aerial view of tracks in the snow made by pigs at a small farm, called Pop's Old Place, in Dorchester County, MD.

— *Lara Lutz*

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### Sand mine spill turns an Eastern Shore creek green

A sand and gravel mine on the Eastern Shore of Maryland spilled so much sediment-loaded wash water that waterways up to 11 miles away turned a milky green color for at least two days.

A Maryland Department of the Environment investigation found that a subsidiary of Chaney Enterprises was responsible for the Dec. 2–4 incident. During that period, water overflowed from the Caroline County plant's settling pond into a ditch, which carried the pollution into a stream and eventually into Tuckahoe Creek.

Aerial photographs captured by the Choptank Riverkeeper show greenish water flowing down the freshwater portion of the Tuckahoe. The creek is a tributary of the Choptank River and is considered an important breeding habitat for several fish species, including white and yellow perch, hickory shad and river herring.

"Heavy discharges of sediment like the one seen here have a tendency to destroy fish habitat, cloud the water and otherwise alter the water quality conditions," said Choptank Riverkeeper Matt Pluta,

"which is concerning for the species of fish that depend on healthy water quality and overall good habitat conditions in order to spawn."

The color of the water was so vivid that Pluta said he initially mistook it for a rare cold-weather algae bloom.

The MDE received a complaint about the discolored water Dec. 2 and sent inspectors to the Chaney Enterprises mine the next day. Officials ordered the plant's managers to shut down the wash plant until the settling pond could be pumped down enough to receive wastewater again without spillage, said agency spokesman Jay Apperson. The company reported Dec. 4 that it had stopped the discharge.

The MDE will continue to monitor the site and plans to meet with the company to ensure pollution-control regulations are met, Apperson added. The MDE also has proposed a \$20,000 fine against the company.

A Chaney Enterprises official blamed the episode on the mechanical failure of a pump used to maintain the water level of the settling pond.

"We really care about the communities we do business in," said Jan Holt, chief customer officer for

the company, based in Gambrills, MD. "We are very sorry for the incident. It's unfortunate and we are at fault."

The company has since installed a second pump at the pond in case the first one breaks down again, she added.

— *Jeremy Cox*

### Chlorophyll limits aim to reduce algae in James River

The Virginia State Water Control Board in mid-December approved new criteria aimed at reducing the amount of algae plaguing the James River. The criteria include standards for chlorophyll *a* concentrations in the river, which are a measure of algae growth.

Allan Brockenbrough, manager of the Virginia Pollutant Discharge Elimination System program for the Department of Environmental Quality, summarized the scientific background for the change — which has been years in the making — at the board's December meeting.

He said the agency ran 32 computer models to learn which pollutants should be reduced from

regulated wastewater facilities to achieve the chlorophyll *a* standards. Of those models, only nine achieved the limits that had previously been set by the board.

Phosphorous levels appeared to have the strongest correlations with chlorophyll *a* reductions, he said. That was factored into the new standards handed down to regulated facilities, and the model was tweaked until the desired levels were achieved, Brockenbrough said.

Overall, water quality groups supported the new criteria for the James. Board members unanimously approved them at their Dec. 14 meeting.

"We are capping over a decade-long process to create scientifically defensible criteria for the James River," said Patrick Fanning, Virginia staff attorney with the Chesapeake Bay Foundation.

But Fanning and others wanted more from the new regulation. He said at the board meeting that the new criteria meet water quality standards "with only a very narrow margin," which is why his group advocated for even lower phosphorous limits for facilities discharging to the James River.

See **BRIEFS**, page 6



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# briefs

From page 5

Jamie Brunkow, James Riverkeeper and senior advocacy manager for the James River Association, agreed, adding that the groups wanted the regulation to apply to more than the tidal portion of the James so that it would include additional facilities.

The groups had also requested chlorophyll *a* limits for the York River. But the DEQ pointed out that the U.S. Environmental Protection Agency is developing more general criteria to address harmful algal blooms that are increasingly cropping up in water bodies in the country.

— Whitney Pipkin

## Company proposes converting PA natural gas to gasoline

A Texas-based energy company wants to build a \$6 billion facility that would produce gasoline from natural gas near the Susquehanna River in northeastern Pennsylvania.

The plant would be built on part of 3,000-acre abandoned coal mine site, which the company said it will rehabilitate.

Nacero, founded in 2015, said its facility in Luzerne County, along with two other plants in

Arizona and Texas, will produce the country's first zero- and low-carbon footprint gasoline for everyday cars and trucks at competitive prices. Construction at the Pennsylvania site would begin by 2024.

The company would produce gasoline from two sources of natural gas. One would be natural gas piped in from hydraulically fractured or "fracked" natural gas in Marcellus shale. Compared to petroleum gasoline, the company claims, the gas-derived fuel would have half the carbon lifecycle footprint — counting extraction, production, distribution and consumption. A second source would be methane gas released and captured from municipal landfills, decomposing animal waste and sewage plants. That gasoline would have a zero-carbon lifecycle footprint, according to the company.

Both fuels would be free of sulfur, one of the main pollutants from refined-oil gasoline that is a precursor to smog and has health impacts.

Under a law passed in 2020 to entice new petrochemical companies to locate in Pennsylvania's fracking regions, Nacero would get about \$6.7 million in tax breaks from the state, per year, for 25 years.

Not everyone is on board, though. A coalition of 16 local and statewide environmental groups on Dec. 21 came out in opposition to the project. They said there is no evidence to back up Nacero's claims of such large carbon-footprint reductions.

"The environmental community is concerned that the proposed [project] will be the first in a new wave of proposals for fracked gas-related projects marketed as good for the climate," a spokesperson for the coalition said, "but that instead will pollute local communities while emitting significant amounts of greenhouse gases and expanding the fracked gas industry."

— Ad Crable

## VA board denies air pollution permit for compressor station

The Virginia Air Pollution Control Board, in a 6-1 vote on Dec. 3, denied a permit to the proposed Lambert compressor station that would pump gas for the contested Mountain Valley Pipeline, already under construction in parts of the state.

The decision was seen by some as a test of the state's commitment to environmental justice because of its potential impact on local and regional air quality.

In contrast to that decision, the State Water Control Board on Dec. 14 voted 3-2 to approve a state-level water permit needed for the Mountain Valley Pipeline to continue construction across streams. The pipeline cuts across the southwest corner of the state outside the Chesapeake Bay watershed.

Federal approvals for aspects of the project from the U.S. Army Corps of Engineers and the

Federal Energy Regulatory Commission are still needed.

A federal judge had ruled in early 2020 that the Virginia air board previously failed to properly weigh environmental justice concerns in issuing an air permit for one of the pipeline's other compressor stations in Buckingham County.

The Lambert station would be located outside the Chesapeake Bay watershed in Pittsylvania County, where it would connect the natural gas pipeline to North Carolina. But Bay advocates have cheered the decision to deny the air pollution permit as setting a new precedent.

"This is a major step forward. In denying this permit, the air board recognized the serious concerns with this facility and understood the [court's] mandate. We hope this shows that Virginia is prepared to make environmental justice a reality," said Taylor Lilley, environmental justice staff attorney for the Chesapeake Bay Foundation.

"The safety of marginalized and vulnerable communities must continue to be a prominent consideration in these proceedings," she said. "This is also an opportunity to prevent a new source of air pollution to the Chesapeake Bay."

The permit will go back to the Virginia Department of Environmental Quality to be potentially rewritten to better address environmental justice concerns.

— Whitney Pipkin



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# Bay Executive Council changes leadership, reviews challenges

## Goals discussed amid low council attendance

By Jeremy Cox

Michael Regan, head of the U.S. Environmental Protection Agency, on Dec. 15 took the helm of the Chesapeake Executive Council, the board of state and federal leaders that oversees the Bay's restoration.

But he did so in absentia. The council needed a successor for Virginia Gov. Ralph Northam, who leaves office in January because of term limits. Accepting the gavel on Regan's behalf at the council's gathering in Richmond was Janet McCabe, his deputy administrator.

Besides the EPA administrator, the council's members include the governors of Maryland, Virginia, Pennsylvania, Delaware, New York and West Virginia; the mayor of Washington, DC; and the head of the Chesapeake Bay Commission, consisting of legislators from Bay states.

Regan didn't miss meeting many of his colleagues. Only two members were on

hand to witness the proceedings, both from Virginia: Northam and state Del. David Bulova, chair of the Bay Commission.

The other states and DC each dispatched deputies. But the absence of so much leadership led some environmentalists to worry that the nearly 40-year-old restoration effort is losing steam.

The Executive Council typically meets once a year, but December's meeting was its second in less than three months. At the Oct. 1 meeting in Virginia Beach, Northam and Bulova were joined by only Maryland Gov. Larry Hogan.

"I am gravely concerned about the lack of leadership by the Chesapeake Bay Executive Council," said Will Baker, then-president of the Chesapeake Bay Foundation. "Only Gov. Northam has made a clear stand in support of Bay restoration. That so many leaders were missing today does not bode well for the future."

The state and federal partnership faces a 2025 deadline to put in place actions to reduce nutrient and sediment pollution in the Chesapeake and meet a variety of other goals deemed critical to restoring the health

of the Bay and its watershed.

But an annual assessment released at the December meeting showed that the program is on track to achieve just 11 of the 31 regional goals. The rest are listed as "off course" or "uncertain."

Efforts in danger of falling behind by 2025 include obtaining 130,000 acres of underwater grasses, expanding urban tree canopy by 2,400 acres and increasing the occupied habitat of brook trout by 8%.

But several speakers at the meeting struck an optimistic tone, pointing to hefty investments in the partnership at the state and federal levels.

Northam highlighted a two-year budget that, among other things, proposes spending a record \$286 million on the Virginia Natural Resources Commitment Fund, a cost-share program that assists farmers with installing conservation practices. The budget also seeks to set aside \$165 million to help the cities of Alexandria, Lynchburg and Richmond fix long-standing sewage overflow problems.

On the federal side, officials touted the \$238 million made available for

Bay-specific funding in the recently passed \$1.2 trillion Infrastructure Investment and Jobs Act. Money for other programs in the bill, such as those that provide loans for wastewater plant and stormwater system upgrades, could further boost efforts.

"We're racing to move those funds to where Congress and the president want them to go," McCabe said. "This is our moment to show that government can work."

Staff members also updated the leadership on efforts to increase diversity, equity, inclusion and justice.

One of the top-line targets of the strategy, adopted by the Executive Council at its 2020 meeting, is to raise the amount of people of color to 25% of the partnership's staff. That figure rose slightly from 2016 to 2019 — from 13.7% to 14.6%. The program registered the goal as "off track."

But other steps are being taken, according to partnership documents. Those include the use of more-inclusive language in grant advertising and a series of focus groups aimed at improving engagement with communities impacted by years of scant support. ■

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# Pipeline's environmental contractor has 'conflict of interest'

## Feds cancel contract for review of VA pipeline

By Jeremy Cox

The Federal Energy Regulatory Commission has taken the unusual step of voiding a contract with a firm it had hired to conduct a “third-party” environmental review of a sprawling natural gas infrastructure project in Virginia.

FERC said in a Dec. 15 public filing that it had dissolved its agreement with the contractor, Burns & McDonnell. The agency’s move came after staffers discovered the firm, while under contract with FERC, was also under contract directly with the project’s developer, Columbia Gas Transmission, on another leg of the pipeline.

That was clearly an “organizational conflict of interest,” FERC said. Burns & McDonnell waived the contract’s 30-day termination notice requirement, the filing said, clearing the way for a new contractor to be brought on board without delay.

The move represented a swift about-face

for a federal agency long criticized as acting as little more than a rubber stamp for energy suppliers. FERC staff members had finalized the contract with Burns & McDonnell only 13 days earlier, according to agency documents.

It’s unclear when regulators became aware of the alleged conflict. The termination notice didn’t specify how the information came to light. But the letter reversing the earlier decision was dated just five days after a *Bay Journal* reporter contacted the agency’s with questions about Burns & McDonnell’s selection.

“Thank you for the inquiry,” Tamara Young-Allen, a commission spokeswoman, said in her reply, also dated Dec. 15. “After further review, the Commission has released this third-party contractor and will be initiating the process for a new third-party contractor.”

Energy watchdog groups applauded FERC’s turnaround. Critics said that if the Burns & McDonnell environmental review of the \$102 million project had been allowed to go forward, it would have been biased by the firm’s direct financial interests

in the other Columbia Gas project.

“The fact that FERC addressed it is great,” said Mary Finley-Brook, a professor of geography and environment at the University of Richmond and an opponent of fossil fuel-derived energy. “We’re looking for leadership. We’re hoping for FERC in this round to be more responsive to what science and the public are saying.”

Itai Vardi, a research and communications specialist with the Energy and Policy Institute, was the first to unearth Burns & McDonnell’s ties to Columbia Gas.

Vardi said the conflict wasn’t immediately obvious. Nothing in the permit application paperwork — a proposal to upgrade a meter station and a compressor station in Louisa County and a compressor station in Goochland County, all along existing company pipeline north of Petersburg — suggested that Burns & McDonnell had a stake in the project’s outcome.

Columbia Gas Transmission, a subsidiary of Canada-based giant TC Energy, first submitted plans to FERC in September for the project, which it called the Virginia Electrification Project.



The National Environmental Policy Act requires most energy projects to be examined to determine what environmental impacts those projects will have and how they can best be avoided. In the energy sector, permit applicants pay contractors to conduct those assessments, but federal guidelines specify that those contractors act as “third parties” that answer to FERC.

In October, documents show that Columbia Gas proposed the names of more than one contractor to FERC. The next month, the agency chose Burns & McDonnell as the “independent contractor” to work for FERC.

The *Bay Journal* submitted detailed questions to TC Energy and Burns & McDonnell. TC Energy didn’t address the conflict, responding only with a statement touting the potential benefits of the project to customers. On Dec. 14, a day before FERC revoked the consultant’s contract to work as a third-party reviewer on the public’s behalf, a Burns & McDonnell spokeswoman responded by email, saying only that the two projects were “separate” and “filed with FERC independently of one another.” ■

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# Regulators briefly close MD poultry rendering plant

## River group tips state on pollution violations

By Timothy B. Wheeler

Maryland regulators forced a problem-plagued Eastern Shore chicken rendering plant to shut down briefly in December after an environmental group tipped them to a batch of new pollution violations there.

The Maryland Department of the Environment on Dec. 21 directed Valley Proteins Inc. to cease operations at its facility in Linkwood in Dorchester County until it could meet its wastewater discharge limits and reduce the risk of overflows from its nearly full storage lagoons.

In a letter to the Virginia-based company, MDE Secretary Ben Grumbles called the plant's operations "unacceptable" and said its recent compliance record "indicates a pattern of improper operations and poor decision-making regarding water pollution and air emissions issues."

The MDE order to suspend operations came after inspectors found multiple

problems at the facility, including discharges of sludge and inadequately treated wastewater into a stream leading to the Transquaking River, and leaks and overflows from treatment tanks.

The company was allowed to resume partial operations two days later after negotiating a consent order with the MDE, which required it to reduce lagoon levels and comply with pollution limits in its permit while undertaking a study of how to upgrade its waste treatment system.

Neighbors and environmental groups have complained for years about the Valley Proteins plant, which takes up to 4 million pounds of chicken entrails and feathers daily from poultry processing plants and renders them into pet food.

The Transquaking, which flows into Fishing Bay, a Chesapeake Bay tributary, has been classified for more than two decades as impaired by nutrient pollution. The rendering plant is the river's largest single source of such pollution, which fuels algae blooms and reduces oxygen in the water to level's lower than what's healthy for fish and other aquatic animals.

The MDE's inspections were triggered by drone images provided to the agency on Dec. 10 by ShoreRivers, a coalition of Eastern Shore riverkeeper organizations, which showed a discolored discharge from the rendering plant's wastewater outfall.

Earlier in the year, ShoreRivers, the Chesapeake Bay Foundation and Dorchester Citizens for Planned Growth notified Valley Proteins they intended to sue over pollution violations at the Linkwood plant, including repeatedly exceeding discharge limits on fecal coliform bacteria, nitrogen, phosphorus and ammonia.

The plant has been operating on an outdated discharge permit since 2006, and in September the MDE proposed to issue a new permit, which critics have demanded be made stricter. The state had at one time offered to provide nearly \$13 million in public funds to pay for an upgrade to the company's wastewater treatment system. But lawmakers cut the amount in half, and the MDE subsequently withdrew the offer after finding pollution violations there.

With the new violations discovered in December, MDE officials extended the

comment period on the plant's new permit into mid-January.

"We are much more focused on enforcement and correcting any ongoing violations before taking any actions on a draft permit," Secretary Grumbles said.

In the Dec. 23 interim consent order, the MDE directed the company to hire an outside engineer and submit a plan within 100 days for improving the facility's wastewater treatment system. The company agreed to pay fines of \$250 per day per violation if it fails to comply with the order's terms.

Pluta said the latest developments add to his concerns about the rendering facility and the state's ability to oversee it, since the violations were only discovered after ShoreRivers reported a suspicious discharge.

"We recognize that there's a need for this type of operation," he said, "but if you can't operate within the guidelines of the law, of your permit, then you shouldn't be able to operate at all."

Meanwhile, on Dec. 28, Darling Ingredients, a Texas-based processor of farm and food waste, announced its intent to buy Valley Proteins for \$11 billion. ■



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# Bernie Fowler, tireless MD advocate for clean water, dies

**With lawsuits, legislation and wade-ins, he pressed to restore Patuxent River, Chesapeake**

**By Timothy B. Wheeler**

**T**hose sneakers are going to be hard to fill. Clyde Bernard Fowler, tireless champion and agitator for cleaning up his beloved Patuxent River and the rest of the Chesapeake Bay, died Dec. 12 at the age of 97.

Over five decades of public and private life, the former Maryland state senator known to everyone simply as “Bernie” never gave up trying to curb the pollution he saw threatening the region’s once-vibrant waterways. He pressed for legislative remedies and joined in lawsuits when nothing else seemed to be working. He also took his case to the public in a way that proved contagious. Through the years, he repeatedly vowed — and urged others — to “never, never, never give up.”

Starting in 1988, Fowler led an annual “wade in” from the banks of the Patuxent, where he had netted for soft crabs as a young man in the 1940s and ’50s, to dramatize the need to restore its clarity and vitality. He recalled that in those days he could wade out into the river and still see his sneaker-clad toes when the water was chest deep on his lanky 6-foot frame.

The wade-ins drew media coverage and politicians, and the “sneaker index” — the water depth at which point Fowler lost sight of his feet — became an informal but important yardstick for judging progress or its lack in restoring the Patuxent.

“We’ve lost a real titan of the Bay community,” said Ann Swanson, executive director of the Chesapeake Bay Commission. Fowler sat on that tri-state legislative advisory body for 37 years, she said, first as a state senator, then as a citizen member

and finally as an emeritus.

“The wade-in was just a beautiful example where Bernie combined science with community involvement,” Swanson said. “He made his sneakers a scientific tool, a Secchi disk. And then he combined it with politicians and music and floats and picnics.”

In an interview with the Calvert Marine Museum, Fowler said the idea for the wade-ins came from Tom Wisner, the late folk singer, environmentalist and educator known as the Bard of the Chesapeake. For years, Fowler had been recounting what he characterized as his “corn pone” tale about seeing his sneakers, when Wisner suggested he reenact it to “send a signal to everybody that you are still wading out there looking to find your feet.”

So, Fowler donned the garb of his youth: coveralls, blue denim shirt, straw hat and white sneakers. He and a dozen or so people waded in at Broomes Island on the Patuxent, where Fowler had crabbed and run a boat rental business for a while after he returned from serving in the Navy during World War II. The ritual has grown since then, but retains the festive flavor and, with encouragement from Fowler, it inspired copycat events on other Bay rivers.

For Fowler, the wade-in was the fun side of what was to him a serious struggle. He became increasingly concerned through the 1960s and 1970s about the state of the Patuxent, and he reached out to scientists at the Chesapeake Biological Laboratory in Solomons in seeking verification that there was something wrong.



*Bernie Fowler's worn, white sneakers were an icon of his annual Patuxent River wade-ins. The depth at which point Fowler lost sight of his feet became an informal yardstick for water clarity. (Dave Harp)*



*Former Maryland state Sen. Bernie Fowler was a passionate champion for the Patuxent River. (Dave Harp)*

“Bernie wanted to become somewhat appropriately educated on the water quality issue because his strong feeling — almost like a gut-level feeling — was that the water was now different than what it used to be,” said Walter Boynton, then a young marine ecologist at CBL, now emeritus. “Quantitatively, he was absolutely right.”

But while underwater grasses had disappeared and the had river grown increasingly murky, state officials insisted it was fine. Steaming over the state’s indifference, Fowler, who had been elected a Calvert County commissioner in 1970, persuaded the leaders of his and two other Southern Maryland counties to sue the state and upriver counties.

After hearing testimony from scientists, a federal judge sided with the Southern Maryland counties. That led to a three-day meeting at which state and local officials, scientists and citizens hammered out a new plan for upgrading the river’s sewage treatment plants, with the aim of taking water clarity back to what it had been in the 1950s.

That 1981 accord, which for the first time emphasized the need to reduce nitrogen, as well as phosphorus, proved to be the forerunner for the 1983 summit between Maryland, Virginia and the federal government that produced the first Chesapeake Bay restoration agreement.

Elected state senator in 1982, Fowler continued to press for cleaning up Maryland’s waters. In 1988, for instance, he

succeeded in getting a law passed that would fine the state’s counties if their wastewater treatment plants failed to meet their discharge limits.

He signed on as a co-plaintiff in yet another lawsuit in 2009, this one brought by the Chesapeake Bay Foundation after the state-federal Chesapeake Bay Program had missed one voluntary restoration deadline and was on the verge of missing a second. The lawsuit sought to force the U.S. Environmental Protection Agency to put the Bay on a “pollution diet” as called for in the federal Clean Water Act. Imposed at the end of 2010, it requires the states and District of Columbia by the end of 2025 to take all of the steps needed to reduce nitrogen, phosphorus and sediment to targeted levels.

In recent years, Fowler grew increasingly frustrated that the river and the Bay weren’t improving as he’d hoped to see in his lifetime. Last June, when Fowler waded into his beloved Patuxent for the last time, he lost sight of his sneaker-clad toes when the water passed 34 inches in depth — far short of what he remembered in his youth.

Now, Swanson said, with the loss of Fowler and other veteran environmental advocates like Tayloe Murphy, a former Virginia natural resources secretary and legislator who died earlier this year, the Bay restoration is facing a generational challenge.

“It leaves a large hole for all of us to fill,” she said. ■



# PA contends its new cleanup plan will meet Bay goals

## EPA says it will decide how to respond by end of February

By Karl Blankenship

Pennsylvania, long criticized for its lack of Chesapeake Bay cleanup progress, submitted an updated strategy to the U.S. Environmental Protection Agency on Dec. 31 that state officials say will meet its 2025 pollution reduction goals.

At issue is how to ramp up efforts in Pennsylvania, which sends the most water-fouling nutrients to the Chesapeake of any state in the Bay watershed. The EPA said it will decide by the end of February whether the plan is realistic.

Adam Ortiz, administrator of the agency's mid-Atlantic region, said that if the EPA does not find the state's watershed implementation plan convincing, the agency could take a variety of actions to force the state to do more — some of which could have costly ramifications.

"We have regulatory powers," Ortiz said. "We will not hesitate to use those backstop measures if the amended WIP is insufficient."

During a farm visit to discuss Pennsylvania's new plan, Karl Brown, executive secretary of the State Conservation Commission, acknowledged "there's no question that Pennsylvania, and particularly the ag sector, has to accelerate our efforts."

But, he said, the state now has "unprecedented momentum" toward meeting its Bay goals. He noted that Pennsylvania had the largest nutrient reduction of any state in the watershed in 2020, the year for which the most recent data is available, and it has recently steered more money toward Bay efforts.

Under a 2010 cleanup plan, the EPA assigned all six states in the Chesapeake watershed, along with the District of Columbia, specific goals for reducing nitrogen and phosphorus, the two nutrients largely responsible for the Bay's poor water quality and oxygen-starved "dead zones." The states are to have all necessary practices in place by 2025 to meet those goals.

Pennsylvania was tasked with reducing the amount of nitrogen it sends to the Bay each year by 39.7 million pounds a year — the majority of the 71.5-million-pound reduction sought from the entire watershed.

But the state's progress, as measured by



Workers bale hay on a Pennsylvania farm. (Dave Harp)

computer models, immediately fell behind. Through 2020, its annual nitrogen load was reduced by just 7.2 million pounds. The EPA has expressed concern about the state's lack of progress over the years but has done little to address the shortfall beyond redirecting and temporarily withholding some Bay-related grant money.

The issue reached a boiling point when the state submitted an updated cleanup plan in 2019 that fell 9.8 million pounds short of meeting its 2025 nitrogen goals and identified an annual \$324 million funding shortfall. Maryland, Virginia and Delaware, along with the District of Columbia, the Chesapeake Bay Foundation and others filed suit against the EPA for failing to press the state to make greater progress. That suit is still pending.

Now, Pennsylvania officials say their amended plan will fully meet its Bay obligations. It includes steps to secure greater nutrient reductions, but it closes much of the gap by contending that the state-federal Bay Program has undercounted nitrogen reductions from the state by 8.6 million pounds. Mainly, those are agricultural practices installed years ago that the Bay Program says have exceeded their expected lifespan and are no longer effective.

"Thousands of functioning best management practices in Pennsylvania, many of them having been federally cost-shared with taxpayer dollars, are now considered expired," said Jill Whitcomb, director of

the Pennsylvania Department of Environmental Protection's Bay office. But, she said, data collected by Pennsylvania and other states shows that many of those "continue to function far beyond their credit duration."

Monitoring data from the U.S. Geological Survey does show significant nutrient improvements in the Susquehanna River, which drains most of Pennsylvania's portion of the Bay watershed. Nutrient trends are also improving in Conestoga Creek, which flows through Lancaster County — the most agriculture-intensive county in the Bay watershed.

Still, even if those efforts are counted, the state would need to fund and implement runoff control measures on farmland at an unprecedented rate.

According to the Bay Program's models, all watershed states — including those suing the EPA over Pennsylvania — have struggled to make significant headway in controlling runoff from farms, where nutrients from manure and fertilizer are the largest source of pollution to the Bay.

Most cleanup progress has come by upgrading wastewater treatment plants. With most of those upgrades completed, all states must now ramp up runoff control practices on farms, such as planting stream buffers and nutrient-absorbing cover crops, at rates none have achieved to date.

But Pennsylvania's task is staggering because of the amount of farmland and

number of farms in its portion of the Bay watershed. Its agricultural acreage is larger than that of the rest of the states combined, and it's home to 30,000 farms, mostly small, creating huge outreach challenges.

Ortiz acknowledged that other states have shortcomings, but he said that Pennsylvania, without dedicated funding to help farmers implement on-the-ground conservation practices, lags behind most other states.

"I'm not diminishing shortcomings elsewhere in the region," Ortiz said. "But the most bleeding is coming from this geographic region and that sector, so we've got to address that bleeding right away."

Ortiz noted that the EPA has increased its technical and financial support, pouring millions of additional dollars into the state. And it is working with the U.S. Department of Agriculture to further increase federal support. In addition, he said, the EPA is working to ensure that efforts are better targeted to locations and projects that will deliver the best results.

"The federal government is putting our money where our mouth is, and we're going to do it in a very targeted way," Ortiz said.

But he said the state also has to step up. In a Dec. 23 letter to Pennsylvania officials, Ortiz said many state programs were "insufficient or lacking" and that Pennsylvania needs to do more to keep livestock out of streams, improve manure management and require stream buffers.

While the General Assembly has failed to provide significant funding for Bay efforts, Ortiz noted that the state could tap federal funding from COVID-19 relief legislation and the recently passed federal infrastructure bill.

In the letter, Ortiz outlined backstop actions the EPA could take if the state's revised plan doesn't meet expectations. It could, for example, extend regulatory oversight over smaller farm operations, require greater nutrient reductions from wastewater plants, object to new wastewater discharge permits that could impact Bay water quality and exert more authority over how Bay-related grant money is used.

"Our job is to work with our partners to get outcomes for nutrient reductions," Ortiz said. "The backstops are one tool to do it. Is it maximally effective? No. But will it help? Yes. Will it increase the pressure for leaders in Harrisburg to step up with the policies and the funding that they need? I believe that it will." ■



# County sued over sewage leaks into James River tributaries

## Environmental groups say agreements to reduce overflows of raw sewage haven't worked

By Whitney Pipkin

Three environmental organizations are suing Virginia's Henrico County in federal court over a history of sewage overflows and pollution discharges to tributaries of the James River near Richmond.

The lawsuit was filed Dec. 13 by the James River Association and the Chesapeake Bay Foundation. In the suit, they allege that outdated sewer and wastewater systems have allowed the release of more than 66 million gallons of raw sewage into the James River system since 2016.

The Henrico County Water Reclamation Facility also has exceeded at least 10 times since 2019 its permit limits for suspended solids that can be released to the James and its tributaries, state records show.

Because of these chronic issues, the county facilities have for years operated under consent orders with the Virginia Department of Environmental Quality. But, the groups point out, those orders have not contained deadlines or holistic plans to update infrastructure and end the pollution.

The latest consent order was approved Dec. 14 by the State Water Control Board, despite requests from the environmental groups that the approval be deferred pending litigation. The agreement between the state and Henrico County includes a penalty of \$207,680 for violations of previous orders but does not include a deadline for systemic improvements.

"There is no concern from DEQ that they are simply avoiding it," Tiffany Severs, director of enforcement at the agency, said

while presenting the consent order to the board for approval. "It is a costly, lengthy process, and they are working on it."

The lawsuit also takes issue with this consent order and others for not requiring the utility to notify residents when sewage overflows occur. Bacteria and pathogens from raw sewage leaking into waterways poses health risks to people who fish, swim or recreate in James River tributaries.

"What Henrico [County] and the state have done is not enough," said Sylvia Lam, an attorney with the Environmental Integrity Project representing JRA. The two parties "have entered into four consent orders to address this."

At the water board meeting, Steven Yob, Henrico County's deputy county manager for community operations, attributed the facilities' increased overflows in recent years to "a perfect storm of issues." Those include, he said, infrastructure aging more quickly while having to handle more intense storms, especially in 2018.

"We are making a significant investment to have world-class facilities," Yob said, noting plans to invest \$200 million to tackle the problems.

Unlike combined sewer systems that were designed in older cities to comingle sewer and stormwater and whisk it out of town as quickly as possible, sanitary sewer systems like the ones in Henrico County are not intended to overflow or leak. But they can be overwhelmed by heavy rain that exceeds the system's capacity or by mechanical failures that prevent them from operating correctly, causing leaks at several points along a web of pipelines running through a service area.

The U.S. Environmental Protection Agency estimates that sanitary sewer systems nationwide account for between 23,000 and 75,000 overflows each year, releasing 3 billion to 10 billion gallons of untreated wastewater directly into streams and rivers. That is far less than what overflows from combined sewer systems, which nationally release an estimated 850 billion gallons of sewage-tainted water, according to the EPA.

But sewer system overflows can occur on land and in public spaces as well as into waterways, creating additional public health



A sewer pipe overflows near the Stoney Run Parkway in Richmond on August 16, 2021. (Jamie Brunkow/James River Association)

and environmental concerns.

The Henrico County Water Reclamation Facility treats sewage from Henrico County, which has a population of 332,538, and from Hanover County, Goochland County, the City of Richmond and about 20 industrial plants.

Maps of recent sewer overflows compiled by the Environmental Integrity Project show a complex system encompassing Richmond and its suburbs, with sewage leak reports scattered throughout the area. Another map indicates that many of the leaks occur in areas populated by people of color or low-income communities.

"Despite that, they are not issuing advisories when this happens," said Taylor Lilley, environmental justice staff attorney with the Chesapeake Bay Foundation. "By failing to fix this problem, Henrico County is putting public health at risk, and we cannot accept that."

Sanitary sewer overflows tend to be fueled by heavy rains, which can flood the system via manholes and cracked pipes and cause it to overflow. Over the past five years, Henrico's system experienced the highest volume of leaks in 2018, one of the wettest years on record. That fueled overflows of 49 million gallons that year, according to state records analyzed by the environmental groups.

But the suit argues that over the last 28 years Henrico County has had plenty of time to correct the underlying issues.

"Compared with other localities that are

facing these challenges to sewer infrastructure ... there is certainly room for improvement," said Jamie Brunkow, James Riverkeeper and senior advocacy manager for the James River Association.

Richmond, Alexandria and Lynchburg have each undertaken costly projects — spending hundreds of millions of dollars — to expand capacity at their water treatment plants and curb combined sewer overflows. The state General Assembly has recently both tightened the deadline on some cities and provided each city with tens of millions to help fund the effort.

But addressing sanitary sewer overflows could be the next frontier of the effort to stop raw sewage from flowing into local waters. The EPA in November released a new consent decree requiring the Hampton Roads Sanitation District to upgrade its systems to greatly reduce overflows by 2030 and 2040.

In Henrico County, regulators have issued dozens of water pollution violation notices to the plant over its 32-year history in operation, including nearly two-dozen notices over the plant's first four years, according to the lawsuit. The first voluntary consent order in 1993 was based on those violations but did not set penalties for failure to comply.

The environmental organizations said they had been in conversation with Henrico County officials and the DEQ and hope to work toward a solution as the legal process unfolds. ■



The Henrico County Water Reclamation Facility is located southeast of Richmond on a tributary of the James River. (Chesapeake Bay Foundation)



# After two years, consensus on oyster policy still elusive in MD

## Meetings produced just one new management recommendation

By Timothy B. Wheeler

It's hard to come together over oysters in Maryland. Two years ago, seeking to get past seemingly endless conflicts between environmentalists and watermen, Maryland lawmakers ordered fisheries managers to try a more consensus-based approach to managing the state's oyster population.

In a bill passed over Gov. Larry Hogan's veto, the General Assembly directed the state Department of Natural Resources to work with scientists and help the DNR's oyster advisory commission come up with ideas for rebuilding the oyster population while maintaining a sustainable harvest. Any recommendation would have to be supported by 75% of the panel's members.

After meeting more than two dozen times, the DNR panel reported Dec. 1 that it had agreed on 19 recommendations — only one of which called for doing anything different about oyster management. That one urged the state to invest \$2 million a year over the next 25 years to restore oysters in Eastern Bay, once a source of bountiful harvests, but which hasn't been productive for the last two decades. The other recommendations mostly called for more research, data collection and evaluation of existing management practices.

"I think everybody was hoping for a little more consensus," said Anne Arundel County Sen. Sarah Elfreth, a chief sponsor of the new oyster management law and a member of the DNR advisory panel.

Hogan, in vetoing the bill, had argued that it would interfere with the oyster management plan the DNR had updated in 2019 and foil progress made in bridging disagreements. But the approach lawmakers spelled out in the 2020 law followed the format of more limited negotiations that had forged an agreement between watermen and environmentalists over oyster management in the Choptank and Little Choptank rivers on the Eastern Shore.

That effort, called Oyster Futures, produced a series of recommendations, some calling for changes in harvest rules and others proposing new restoration initiatives.

But the DNR commission's oyster policy review was handicapped, participants agreed, by having to hold most of



*A waterman wields hand tongs to harvest oysters in Maryland's Choptank River. (Dave Harp/2017)*

its meetings virtually. Some members, particularly watermen in rural areas of the Eastern Shore and Southern Maryland, had difficulty getting online or being able to participate.

"I was really disappointed in the process," said Ann Swanson, executive director of the Chesapeake Bay Commission and member of the advisory panel. "We never got to the point where we could ever truly give and take — give on some harvest advancements in exchange for some ecological gain."

The lack of in-person meetings prevented commission members from getting to know each other and understanding other points of view.

"We never ate together. We never chatted together," Swanson said. "We'd come into a supercharged three-hour meeting, and so the conversations that you have that instill trust didn't happen."

The commission had plenty to talk about. A team of scientists from the DNR and the University of Maryland Center for Environmental Science analyzed the likely results of more than 70 different options for adjusting oyster management and restoration policies and practices.

Michael Wilberg, a member of the UMCES team, said computer modeling of various scenarios had helped the Oyster Futures group work through their differences. But the statewide review was hampered, he said, by the meeting handicaps and a fixed deadline for delivering recommendations to the governor and legislature.

"One of the important parts of this process is for people to propose new ideas and see us go out and try them and bring them back to the group," he said. "That gets people talking to each other rather than trying to go around each other."

"I don't feel we got quite to that level," he added. "The group was just trying to get there, but we just ran out of time."

Even so, Allison Colden, fisheries scientist with the Chesapeake Bay Foundation, said the computer modeling identified at least a couple of "win-win" scenarios that she thought could be the basis for agreement. But, she said, "we ended up with a result where we really didn't come to consensus on anything with regard to making forward progress on oysters."

A couple of the policy scenarios run through the computer model did project increases in oyster abundance and harvests alike, with more shells available to replenish worn-down reefs, Wilberg said.

"The problem I think people had ... was how expensive they were," he said. To achieve that modeled result, the state would need to invest about \$20 million a year, he said, or 10 times what it spends now, to replenish reefs with recycled oyster shells and hatchery-spawned juvenile oysters.

Watermen likewise expressed frustration. "I'm not real happy, but we're moving," said Robert Brown, Sr., president of the Maryland Watermen's Association. He and others had argued that all the state needed to do was return to its longstanding

practice of replenishing reefs with oyster shells and allowing watermen to transfer juvenile "seed" oysters from the Lower to the Upper Bay. Computer analysis didn't support that, though.

Despite the commission's near gridlock, watermen said the oyster population appears to be rebounding on its own, after two summers of good natural reproduction.

Wilberg agreed that there are signs that after decades of ups and mostly downs, the oyster population could be starting to stage a strong recovery. But oyster reproduction is uneven in Maryland's portion of the Bay, he noted, and the ability to rebuild the stock is limited by the loss of many of the reefs that used to sustain the population.

"It's possible that the future looks really rosy," he said. But the model indicates that if current management practices continue unchanged, he added, "it looks like we should expect a slow decrease in the future, mainly because of the loss of [reef] habitat."

As the last commission meeting ended, DNR Secretary Jeannie Haddaway-Riccio, who two years ago had called the legislature's action "misguided," strove to put the outcome in a positive light.

"I think that they did better than we expected," she said, adding that members had worked through "incredibly hard circumstances."

"We still have a lot of work to do," she concluded, "but the fact that they were able to agree on some things is a great start." ■





Juliana Barros, 5, plays in floodwater during the 2019 annual "king tide" in Norfolk, VA. (Jeremy Cox)

# New (and old) environmental issues lie ahead on state lawmakers' agendas

## Climate, environmental justice, Chesapeake cleanup funds are priorities

By Timothy B. Wheeler, Jeremy Cox & Ad Crable

As lawmakers in Chesapeake Bay watershed states convene in the new year, a variety of environmental issues are expected to come up for debate — some new, others revived from previous sessions. Here's a legislative preview for 2022.

### Maryland

Climate action, environmental justice and increased funding for Chesapeake Bay restoration efforts are among the top environmental issues facing lawmakers in their 2022 General Assembly session, which began Jan. 12 and runs through April 11.

Environmental advocates are hoping that this year the third time really is the charm for climate legislation. Last year, the state House and Senate each passed bills to accelerate the state's efforts to reduce greenhouse gas emissions, but legislators failed to iron out differences between the measures before the 90-day session ended.

This time, activists have joined forces to press for comprehensive climate action focused on renewable energy for electricity generation, transportation, and schools and other buildings. The proposed bills would commit the state to reducing greenhouse gas emissions 60% by 2030 — a 50% increase over the state's current goal — and reaching carbon neutrality by 2045.

But the legislative package also aims to address the disproportionate impacts of air and water pollution on overburdened downwind and downstream communities, many of which have higher percentages of people of color.

"We have a tremendous opportunity this legislative session to be a leader, not only on climate, but also on making Maryland a leader on environmental justice," said Staci Hartwell, environmental justice chair of the Maryland NAACP, in

a December announcement of the coalition's legislative platform.

In addition to providing new incentives and regulations to reduce fossil fuel use, advocates say their package would seek to address past and future inequities. It would include tax incentives, for instance, to increase access to solar energy and energy efficiency for low- and middle-income families and to prioritize equity in planning future transportation projects.

"We want to electrify buildings and cars, and we want to decarbonize the economy, and we believe we can do it without ... burdening consumers," said Del. Kumar Barve, chair of the House Environment Committee. Advocates also hope to electrify the state's school buses to spare children from harmful diesel exhaust as well as to fight climate change.

The climate-justice legislation could take different forms in House and Senate, but

leaders say they're committed to passing the overall agenda this year, given the United Nations' latest scientific report warning that climate change is accelerating.

"We have no time to waste," said Sen. Paul Pinsky, chair of the Education, Health and Environmental Affairs Committee.

There's another reason to feel a sense of urgency. Fall elections will seat a new General Assembly in 2023, so any bills vetoed near the end of or after this 90-day session would have to be reintroduced and go through the legislative grinder all over again. Advocates are pressing lawmakers to act early enough to override possible vetoes by Gov. Larry Hogan.

With federal fiscal stimulus funding contributing to a record \$2.5 billion state budget surplus, the Chesapeake Bay Foundation hopes to see more money spent on initiatives that can help restore the Bay while also easing the impacts of climate change.

The foundation intends to press for millions of dollars more for tree planting, urban agriculture and stormwater pollution controls. The group also wants lawmakers to beef up the state's environmental enforcement by mandating more frequent inspections and stiffer penalties for pollution violations. There are more than 300 facilities statewide that are either out of compliance or operating on outdated discharge permits, according to Josh Kurtz, the foundation's Maryland executive director.

This year will also see another attempt at amending the state constitution to enshrine Marylanders' rights to clean air, water and soil. Though the environmental rights amendment has failed to get out of committee in three previous years, advocates believe they're gaining ground in their push for Maryland to join Pennsylvania, New York and other states in making a healthy environment a fundamental human right.

Legislation aimed at protecting people from so-called "forever chemicals," which failed last year, also will get another try. It would ban the use of intentionally added PFAS compounds in firefighting foam, food packaging, and rugs and carpets.

### Virginia

Environmentalists find themselves on the defense after voters last November replaced outgoing Democratic Gov. Ralph Northam with a Republican, businessman Glenn Youngkin, and handed the GOP control of the state House of Delegates.

"I think people will be mentally preparing themselves to be taking a more defensive approach," said Narissa Turner, the



climate and clean energy policy manager at the Virginia Conservation Network. “We’re hoping to maintain the gains we’ve made over the last couple of sessions.”

After 2020 elections, Democrats held the reins of the state’s executive and legislative branches, the first time since 1993 that they had done so. On the environmental front, they used their advantage to cement the state’s membership in the Northeast’s carbon cap-and-trade program, ban Styrofoam food containers and set a 2050 deadline for the state’s two main electricity suppliers to be 100% carbon-free.

Now, Democrats cling to a 21–19 majority in the Senate as their only check on the new administration’s ambitions.

Youngkin’s actions as governor-elect — he officially took office Jan. 15 — have all but confirmed environmentalists’ fears of rollbacks.

In December, Youngkin, a former CEO of a private-equity firm, announced plans to pull the state out of the cap-and-trade program through executive action. His transition office said that leaving the program, officially known as the Regional Greenhouse Gas Initiative, would save ratepayers \$4.37 a month, or slightly more than \$50 per year.

Youngkin, however, is unlikely to be able to make the move on his own — at least not without a fight. Government experts say that the carbon targets are written into state code. To change them would require an unlikely about-face by Democrats in the Senate.

If Democrats hold firm, Youngkin might still be able to sever the state’s relationship with the RGGI. As governor, he has authority over the Department of Environmental Quality, which oversees the RGGI auction program. His administration would have to find an alternative way to reduce pollution if the emission targets remain on the books.

The Air Control Board represents another hurdle for Youngkin. It has already enacted regulations setting the program in motion. He can appoint new members to the seven-member board but not until July, when two seats are up for grabs.

Youngkin drew considerable flak from environmentalists Jan. 5 when he nominated Andrew Wheeler as secretary of natural resources. Wheeler, a former coal lobbyist, was head of the Trump era U.S. Environmental Protection Agency, where he oversaw attempts to roll back federal air and water pollution regulations, including protections for wetlands and streams.

Michael Town, executive director of the Virginia League of Conservation Voters, called the pick unacceptable. “This is hands down the most extreme nomination for an environmental post in Virginia’s history and the absolute worst pick that the governor-elect could make,” he said in a statement.

Democrats hold confirmation power in the Senate, and several were quick to blast Youngkin’s selection.

“I know he’s new to Virginia government and all, but [Youngkin] does understand

cabinet secretaries require General Assembly approval — right?” tweeted Sen. Scott Surovell, D-Fairfax. “Some GOP legislators should have problems with this unless they’re not interested in re-election?”

Environmentalists widely praised Northam’s final budget proposal, which outlines spending over the 2023 and 2024 fiscal years. Key outlays include:

- \$100 million to Richmond, \$40 million to Alexandria, and \$25 million to Lynchburg to help upgrade their wastewater systems to prevent future overflows into nearby streams and rivers.

- \$286 million to the Virginia Natural Resources Commitment Fund, ensuring full funding of the state’s program to improve stormwater controls on farms.

- \$12 million to help tribal nations conserve and expand their lands, and \$10 million to preserve historic sites related to Black and Indigenous Virginians.

Although Northam won’t be in office when the next budget is adopted, his proposal still matters, said Peggy Sanger, the Bay Foundation’s Virginia Executive Director. “It is certainly meaningful,” she added. “Like most bodies, you work from the document you’ve been given.”

The General Assembly convened Jan. 12 and will run until March 12.

## Pennsylvania

After a year in which only two minor environmental bills passed the General Assembly, 2022 has the potential to see several longstanding initiatives that benefit the Chesapeake Bay see the light of day.

For example, after 11 consecutive years bottled up in committees, a fertilizer bill has earned bipartisan support and buy-ins from commercial fertilizer manufacturers, nurseries and landscapers.

If passed, new regulations would limit the amount of fertilizer that can be applied on Pennsylvania’s estimated 2 million acres of turf grass. Commercial fertilizer placed on lawns would have to follow certain rates by licensed applicators, and enforcement processes would be set up. Labeling on fertilizer bags sold in stores would warn against overapplication, and a public education program would be funded.

One sticking point — that EPA give Pennsylvania credit for nutrient reductions resulting from the tighter controls — has been worked out.

“The language is there for this to be meaningful,” said Marel King, the Chesapeake Bay Commission’s Pennsylvania director.

Another bill that has bipartisan support is a Community Solar Bill that would allow



*A sapling stands in a protective cover at the site of a streamside forest planting in Pennsylvania. (Dave Harp)*

state residents, farmers and businesses to invest in local, small-scale solar projects and earn credits on their electric bills.

Less certain are several initiatives that would significantly increase funding for agriculture conservation practices that would help improve water quality locally and in the Chesapeake Bay.

One bill would allocate \$500 million from the state’s federal American Rescue Plan for farm conservation, mine reclamation, open space and recreation projects. Another would collect fees from the largest commercial users of water to raise \$350 million a year, which would help fund farm conservation measures and water restoration projects.

Another new funding source would come from a bipartisan bill to create an Agricultural Conservation Assistance Program.

Several bills aim to mandate an increase in the amount of electricity generated in the state by renewable energy.

The Republican-controlled legislature also hopes to undo Governor Tom Wolf’s executive order to have Pennsylvania join the Regional Greenhouse Gas Initiative, which would impose fees on utilities, on the state’s behalf, if they fail to meet goals for reducing power plant emissions. ■



*In this June 2020 photo, Steve Levitsky, then Perdue’s VP for Sustainability, walks through the pollinator garden surrounding the company’s solar array at their headquarters in Salisbury, MD. (Dave Harp)*



# Patuxent commission shakeup follows development debates

## Hogan replaces five members, including Patuxent Riverkeeper

By Timothy B. Wheeler

Back in 1980, Maryland lawmakers had become so concerned about the declining health of the Patuxent River that they created a commission to help rescue it. The legislature charged the panel with keeping tabs on state and local efforts to restore the 110-mile-long waterway from the pollution clouding its water, killing its grasses and depleting its crabs and fish.

Four decades later, the Patuxent is still ailing. Now, river advocates say, the commission itself needs rescuing after Gov. Larry Hogan without warning removed its two longest serving members, including Patuxent Riverkeeper Fred Tutman, who had pressed the panel to oppose development projects that the two believed would worsen water quality.

Tutman, a commission member for 23 years, and Barbara Sollner-Webb, a civic activist with 18 years on the panel, received letters from Hogan in late November thanking them for their service and indirectly informing them they had been replaced.

Their ouster comes after they sparred with the secretary and staff of the Maryland Department of Planning while trying to get the commission to take stands on land use decisions affecting the river.

"This is a pretty clumsy move to throw a couple of activists off a commission that's frankly supposed to be looking at these issues," Tutman said.

A spokesman for the planning department, which provides staff support for the 34-member commission, said Planning Secretary Robert McCord chose not to recommend their reappointment because he wanted "new perspectives" on the panel. Agency spokesman David Buck did not elaborate.

In all, Hogan replaced five incumbents on the commission and filled vacancies left by two members who did not seek reappointment. But Sollner-Webb said that by removing the panel's most outspoken advocates for the environment, the administration is "making clear to other members if you speak out, you're going to be axed."

Tutman said that his removal from the commission is particularly puzzling,



Barbara Sollner-Webb and Fred Tutman, shown here with a water sample taken at the Queen Anne Natural Area on Maryland's Patuxent River, were removed from the state's Patuxent River Commission after raising objections to development projects. (Dave Harp)

because the riverkeeper organization he runs works to protect and restore the Patuxent and conducts cleanups and other volunteer activities intended to promote public awareness and stewardship. The commission, in fact, had voted years ago to endorse the creation of the organization, he noted.

The shakeup came in the wake of efforts by Tutman and Sollner-Webb to have the commission weigh in on a pair of controversial development projects in Howard County. It's the state's second-fastest growing county, having experienced a nearly 16% population increase since 2010.

### A changing river

Growth is an existential issue for the Patuxent, which drains parts of seven Maryland counties. The 900-square-mile watershed was once overwhelmingly farmland. Now, homes and commercial development cover an increasing share of the landscape, with discharges from 36 wastewater treatment plants.

The commission was formed in part to iron out differences among the seven counties. In the late 1970s, the rural Southern Maryland counties along the lower river sued the state and suburbanizing counties

upriver, arguing they were not doing enough to control pollution. The lawsuit led to a "charrette," or summit, at which all agreed to work together for the river's benefit.

In 1980, the General Assembly passed the Patuxent Watershed Act, which created the commission and directed it to come up with a plan to guide state and local policies and regulatory decisions in the watershed. Originally, the panel had 11 members, including a seat for each of the seven counties but, in 1995, lawmakers expanded membership to 34 and broadened its duties.

Nutrient and sediment pollution have declined significantly since then in the upper half of the river, according to the U.S. Geological Survey. The improvements have slowed in recent years, though, and much of the river remains biologically impaired. Its lower, tidal portion earned a D-minus last year on an ecological health report card from the University of Maryland Center for Environmental Science.

In 2018, Tutman and Sollner-Webb voiced concerns about a 35-home subdivision proposed in historic Savage on the Little Patuxent River, one of two chief tributaries to the main river. The project depended on Howard County agreeing

to swap a chunk of parkland for another parcel owned by the developer. Critics complained the development would increase runoff to the river. They also noted that the county bought the parkland with federal money and was part of a "targeted ecological area" identified as a conservation priority by the state Department of Natural Resources.

But Planning Secretary McCord blocked the commission writing to Howard officials. He informed panel members that they lacked the legal authority to comment on private development projects, and he produced an unsigned opinion to that effect from the department's chief counsel.

Buck, the state planning spokesman, said McCord only intervened after hearing from a Howard County official. According to meeting minutes, McCord warned commission members that getting involved in local land-use conflicts threatened to alienate county and municipal officials, who'd stop participating in the panel's other work.

Unwilling to give up, Tutman and Sollner-Webb got sympathetic legislators to appeal to Attorney General Brian Frosh. His office responded with an unofficial opinion that reversed the earlier one and declared the commission was within its rights to comment on development projects.

The pair hit another hurdle last year when they tried to get the commission to speak out about a 1,440-unit senior living complex proposed on 62 acres in the upper reaches of the Middle Patuxent, the main river's other branch in Howard County. The project, Erickson at Limestone Valley, also involved swapping land that had previously been put off limits from development under the state's agricultural land preservation program.

"It is the camel's nose under the tent," Sollner-Webb said of the land swap. Tutman also argued it would further jeopardize water quality in a once-rural area that is experiencing intense development. He noted that a service station had been built over the river's headwaters near the Erickson project.

When Sollner-Webb and Tutman moved to oppose the project, most commission members who represent government agencies — and who hold nearly two-thirds of the seats — abstained. A bare majority of the other members wanted to oppose the project, but the state planning staff declared that the abstentions counted as "no" votes, killing the motion.

Seeking another way to register the



commission's concerns, Sollner-Webb then proposed that it endorse the Erickson project. With most government representatives again abstaining, that motion also failed. Sollner-Webb took that as a backhanded victory, showing that the commission did not support the project. The Howard County Zoning Board approved the project nonetheless in November.

## Surprising shakeup

About the same time, Tutman and Sollner-Webb learned to their dismay they had been replaced. Only a few months earlier, a state planning staffer had emailed all of the Patuxent River Commission members whose terms were expiring, asking if they wished to be reappointed.

Michael Leszcz, chairman of the commission, said he was surprised by the membership shakeup.

"It's [the governor's] prerogative to choose who he wants for the commission," said Leszcz, who holds a seat designated for the city of Laurel. But he added, "This is the first time it's been handled like this."

Chris Perry, the commission's vice chairman and an environmental consultant — who was reappointed — likewise said he was surprised. Tutman and Sollner-Webb were "by far the most active and engaged [members of] the commission," he said, "so it's a big loss not to have them anymore."

Richard E. Hall, secretary of planning under the previous administration of Democratic Gov. Martin O'Malley, said he was saddened but not surprised by the shakeup at the commission. He served as staff to the river commission for more than a decade, he said, and he couldn't recall the panel ever being told it couldn't comment on an issue that concerned the river.

"The Patuxent ... was always seen as Maryland's proving ground for the Chesapeake Bay Program," he said. The federal-multistate Bay restoration effort was formally launched a few years after the Patuxent cleanup agreement and has focused on similar problems and remedies.

In the late 1990s, Maryland adopted a Smart Growth law aimed at reining in suburban sprawl and the environmental harms it causes. But Hall said the state's commitment to that has withered in recent years, contending in a Facebook post that "the Hogan administration has taken MD backwards on growth policy big time."

Hogan, a Republican who headed a real estate development firm before being elected governor in 2014, had criticized his predecessor's growth management policies. He had vowed to ease state oversight of land use decisions, saying they belonged in



*Jug Bay Wetlands Sanctuary on the Patuxent River in Prince George's County, MD, encompasses 1,500 acres of wetlands, forests, meadows and fields. Though significant amounts of land have been preserved along the river corridor, growth pressures continue throughout much of the watershed. (Dave Harp)*

the hands of local officials.

To some, the shakeup on the commission is emblematic of the Patuxent's continuing woes and the political sensitivity of trying to rein in development.

Ralph Eshelman, a historian and author from Southern Maryland who's working on a book about the river, noted that the Patuxent is the only river in the state with its own advisory commission. At times it seemed to him the panel was more interested in promoting tree plantings, litter cleanups and other feel-good events without tackling the river's underlying problems.

Now, he said, it's "being handcuffed. They [state officials] are deliberately getting rid of people who are trying to do a good job. They're deliberately getting people on board who don't give a crap."

Hogan's new appointments to the commission include Margaret Everson, a former top Interior Department official and briefly acting National Park Service director under the Trump administration. Hogan had previously appointed two others to the board of the Maryland Environmental Service. One of them, Morgan Hall, Jr., is described on the MES website as a lifelong Baltimore citizen who works at Aberdeen Proving Ground in Harford County — neither location is in the Patuxent watershed.

State planning spokesman Buck said there's no requirement that Patuxent

commission members live in the watershed. He called all the governor's appointments "assets" to the commission.

## Calls for reform

Sollner-Webb, an emeritus professor at Johns Hopkins, is president of the West Laurel Civic Association and a board member of the Prince George's County chapter of the Sierra Club. She said the commission has done some good in the past by putting pressure on local and state agencies to improve sediment runoff controls at construction sites.

Lately, though, she said she's convinced that the state planning department doesn't share the mission of the commission.

"The Department of Planning is planning for future growth," she said. "Using the river to allow for more development is not why the commission was set up. It was to preserve the river as a natural treasure."

Gary Hodge, a former director of the Tri-County Council for Southern Maryland who served on the panel for its first 14 years, said it's time for lawmakers to step in again. He recalled that former state Sen. Bernie Fowler, who was hailed as the "heart and soul" of the Patuxent when he died in December, had spent more than three decades on the commission.

"The way the river goes, the Bay's going to go the same way," Fowler had warned as early as 1969. He famously vowed to

"never, never, never give up" trying to rescue the Patuxent and the Bay. But in the past decade, his belief in progress waned. In a 2014 interview, he said the commission had become unworkable since lawmakers had expanded its membership, and the river was still in dire shape.

"After 45 years of working very hard, the Patuxent River today [2014] is in worse shape than it was when I started back in 1969," Fowler said. He quit the commission not long after that.

"The fundamental purpose of the commission is not to meet every month and eat sandwiches and have nice conversation," Hodge said. "The purpose ... is to protect the river. If that goal isn't being achieved, the people who have a stake in its health ought to be able to refocus the commission on its charge and structure its function and bylaws in a way it can fulfill its mission. Otherwise, it ought to sunset."

State Sen. Paul Pinsky, a Prince George's County Democrat who chairs the Senate Education, Health and Environmental Affairs Committee, said he plans to introduce legislation during this General Assembly session that will at least ensure that Patuxent Riverkeeper Fred Tutman has a seat on the commission. "I thought it was silly to remove him just because he's outspoken," Pinsky said. "He wants a clean river, just like a lot of people do. So, we're going to try to remedy the situation." ■





Beavers build dams that encourage healthy floodplains and stream systems that move water more slowly across the landscape. (Dave Harp)

# Can beavers help build a better Bay?

Some say nature's engineers restore streams effectively, at lower cost

By Karl Blankenship

Scott McGill was standing beside a stream that, to many people, wouldn't look like a stream at all. But if an explorer had been plopped down here four centuries ago, in what is now Baltimore County, MD, this is the way a stream might have looked, he said.

This section of Long Green Creek is a sprawling ponded area of 7 or 8 acres, surrounded by shrubs and trees and flanked by marshy soil that sank with each step. Muddy, vegetated mounds occasionally pierced the surface.

Wildlife, especially waterfowl, like it that way. "We have flocks of black ducks and woodies," said McGill, who heads Ecotone, an ecological restoration company that has been working on this stretch of stream for years. "We've even had pintails, which typically aren't common around here."

Yet he wasn't taking credit for the results. If he had done the work, McGill said, "it would have cost millions, and it wouldn't have been as good."

His contribution was modest, having planted the streambank with trees that turned out to be beaver food. It was the beavers who transformed the stream.

Now, McGill and a small group of "beaver believers" are hoping to transform the way the Chesapeake Bay region thinks about its waterways — and the role that North America's largest rodent should play in restoring their health.

Allowing those furry engineers to replumb the stream systems, they contend, can sharply reduce Bay pollution at a fraction of anticipated costs. The revitalized streams would also increase the diversity and productivity of streams for frogs, birds and fish, including some rare species.

Stream systems that include beaver-engineered ponds, they say, will also buffer the impacts of climate change by reducing downstream flooding, mitigating drought and recharging groundwater.

The idea isn't far-fetched: Beaver-based restoration is embraced in the Pacific Northwest, where conservation groups and federal agencies are enlisting the rodents in low-cost, low-tech efforts to restore stream systems that are vital for salmon.

The Bay region lags in such beaver buy-in, although McGill helped to arrange a three-day conference near Baltimore in early 2020. Dubbed "BeaverCon," it

brought people from across the continent and Europe to jump-start that discussion. Now, he and like-minded beaver advocates are putting together a proposal in which landowners might get credit for reducing water pollution by maintaining beaver dams on their properties.

The biggest impediment? People mainly view beavers as a nuisance.

Touring the beaver pond at Long Green Creek with McGill, *Bay Journal* columnist and Salisbury University environmental studies professor Tom Horton recalled his standoff with beavers 15 years ago, at his home along Maryland's Nanticoke River. When a pair began chewing his native vegetation, he wanted them gone. "A guy at the Department of Natural Resources said, 'You ought to let them dam it.' I said, 'they're eating my damn trees.'"

He called a trapper. Today, Horton says that was a mistake, having written and narrated a *Bay Journal* film, *Waters Way*, which touts the stream revitalization potential of beavers.

Changing public perception, though, will be a challenge. "If I mention beavers to any group — my students or faculty — the

first two reactions are they cause flooding and they chew down trees," Horton said. "That is where you are starting at."

## Ecosystem amnesia

Not far from the beaver pond, McGill stood on a dry bank above a narrow water channel running through a 2-foot-deep ditch. This is pretty much what people in the mid-Atlantic have come to think of as a "natural" waterway, McGill said, "[but] you should not be able to walk here in sneakers without getting your feet wet."

That people see such degraded streams as natural while considering beaver ponds out-of-place nuisances is a symptom of what some call "ecological amnesia."

"Most of our understanding of this continent came after beavers were already removed from the landscape," said Frances Backhouse, author of a recent book on beavers, *Once They Were Hats*, at BeaverCon. "And that really skewed our perception of what natural ecosystems look like and how they function. It also delayed our scientific study of this animal because they simply weren't there to study."

In 1607, when Europeans established Fort James in the colony of Virginia, North America had between 60 million and 400 million beavers — somewhere between 10 and 75 per square mile.

Beavers were quickly recognized as a valuable commodity for meat and the oils they secreted, but especially for their fur, which was turned into hats. The pursuit of beavers was so intense that Virginians and Marylanders engaged in a sporadic shooting war in the mid-1600s for control of the Chesapeake beaver trade.

Beavers were quickly trapped from the region's landscape, foreshadowing what would happen across the continent. By the mid-1800s, they were gone from Pennsylvania and probably the rest of the Bay watershed. Continentwide, their population was reduced to around 100,000.

## A landscape transformed

Lost with the beavers was the critical role they played in making streams an incredibly inefficient way to move water.

Four hundred years ago, the Bay watershed was largely forested, dominated by old-growth trees and soft, sponge-like forest floors that absorbed most of the rain before it had a chance to reach a stream. Most water flowed to streams through groundwater, not runoff.

Streams often were not the single-channel waterways people envision today. Instead, they consisted of multiple, braided rivulets. When it rained, water from those



rivulets quickly spread across the floodplain, where wetland plants slowed the flow, allowing much of the water to soak into the ground.

The downstream flow was further hindered by the huge beaver population. Using twigs, sticks, small trees, mud and stones, their sturdy dams often stood several feet high and could hold back acres of water. The resulting ponds raised water levels enough for the beavers to build underwater entrances to lodges that offered protection from predators.

As water levels rose, beavers made their dams higher and wider, trapping even more water. They eventually abandoned sites when nearby building supplies and food (small trees and shrubs) were used up. The vacated dams broke down, and a succession of wetland plants moved back into the nutrient-rich soils left behind, until the next wave of beavers arrived.

As a result, stream valleys were a mosaic of ponds interspersed with wet meadows through which stream threads would flow. Because these systems trapped so much freshwater, the Bay was saltier. Oysters thrived in Baltimore Harbor, which is far too fresh for them today.

As beavers were trapped out and settlers moved in, forests were cut and streamside land was drained for farming. Streams were transformed into systems designed to drain land efficiently and flush both water and pollutants downstream.

Sediment, which once largely settled onto floodplains or behind beaver dams, moved downstream with ease. The port of Baltimore, established on the Patapsco River in 1706, was relocated twice in the century that followed, as channels filled and became inhospitable to ships.

Grace Brush, of Johns Hopkins University, has reconstructed the watershed



*This marshy area was formed upstream of a beaver dam on Long Green Creek in Baltimore County, MD, helping the floodplain to hold and absorb water. (Dave Harp)*

transformation story by studying sediment cores drawn from the Bay bottom. Pollen in those cores show that plant communities changed from wet-meadow species before colonization to plants that prefer dry conditions, such as ragweed.

The lost floodplains served another important function. Allowing those areas to be covered with a thin film of water created pockets of oxygen-starved soils. That promoted bacterial communities that removed nitrogen from the water, even as increasing amounts of the nutrient were poured onto the landscape.

Unlike the beaver pond, the channelized stream McGill stood beside had lost its connection with the floodplain — and

therefore much of its ability to reduce nitrogen. As streams across the watershed were similarly transformed, more nutrients entered the Bay, where they now cause oxygen-starved “dead zones.”

“In order to restore the Bay’s productivity, we must increase the wetness of the land and restore its capacity to denitrify,” Brush said at BeaverCon. “And beavers could play a large role in this process.”

### Nature’s pollution control

In the 1970s, the Smithsonian Environmental Research Center established several long-term monitoring sites to understand how land use was affecting streams. They got a surprise in 1990, when beavers built a dam just a few yards upstream of one of the sites on SERC’s property near Annapolis.

“When we saw the beaver dam, I had two reactions,” recalled Tom Jordan, a senior scientist at the research center. “One, this is a perfect experiment. Thank you, beavers. And the other was, this is really going to be great for ice skating.”

Monitoring of the site, and a nearby undammed stream, showed that the beaver structure improved water quality. It reduced nitrogen by 18%, phosphorus by 21% and sediment by 27%.

The notion that beavers were doing things people wanted — for free — was not lost on those working on streams in surrounding Anne Arundel County.

Two decades ago, the county was working to preserve wetlands with rare

plants that required groundwater seepage to survive. They designed projects to hold back water and divert it into the soil.

“At some point, it clicked that, ‘Hey, this is very similar to what beavers do,’” said Erik Michelsen, deputy director of the county’s bureau of watershed protection and restoration.

Today, Michelsen said, the county increasingly designs projects with the intent that beavers will move in and take over.

As beavers occupy new areas, their impact is magnified — at no cost, and without having to go through a sometimes onerous, permitting process. Further, Michelsen said, “they’re a maintenance crew that is on-site constantly.”

### Worth a dam — or more?

Keeping water on the landscape requires more space than a single stream channel, though Michelsen and McGill said that even on densely developed land a series of beaver dams can still hold back large amounts of water.

But the notion that water should be kept on the landscape is often at odds with both human perceptions of how streams should function and with traditional approaches to restoring waterways. Essentially, stream restoration efforts often seek to establish stable channels that efficiently move water downstream to prevent flooding, while adding in pools and riffles to improve habitat.

“Usually, we’re kind of gun-shy about having water stick around too long on the landscape,” Michelsen said.

But those engineered streams are costly. They typically require driving bulldozers into waterways to gouge away centuries of accumulated sediment and reconfigure channels, but they produce the predictable results humans often prefer.

Backers of beaver-based restoration, which started in Western states to improve habitat for salmon, advocate for a “process-based” approach in which conditions are established for beavers to recolonize an area and transform a more natural stream valley over time.

Instead of digging away several feet of accumulated sediment along a deeply incised stream at huge expense, they allow beavers to build a cascading series of dams that raises the stream level, allowing it to spread over a new floodplain.

Getting beavers on the job can be tough, as rapidly flowing water in many of today’s degraded streams can blow out any beaver dam. The use of wooden “beaver dam analogs,” which mimic beaver dams, can



*Scott McGill of Ecotone visits a beaver lodge on Windlass Run in Baltimore County, MD. He says beavers have been a cost-effective part of Ecotone’s stream restoration projects. (Dave Harp)*



reduce the flow until beavers take over.

“In a lot of our work, we’ve tried to simplify our restoration approaches,” Michelsen said. “If the endgame is to have that whole system submerged by beavers moving into the system, why spend hundreds of thousands of dollars designing fine channels and all these other kinds of features?”

McGill said that a traditional stream restoration project costs, on average, about \$500 a foot. But simple techniques using beaver dam analogs are a fraction of that cost. There are trade-offs. Beaver engineers are less predictable than their human counterparts, and their timetable is often longer: A stream transformation may take years.

But, McGill points out, the Bay watershed is drained by more than 100,000 miles of streams and many, if not most, are degraded. Beavers are the only available work crew that can take on the job, do the ongoing maintenance and produce a supply of new dam builders to expand the scope of their work.

“We’re not going to be able to fix all these streams with rocks and logs and bulldozers,” McGill said. “How are we going to scale up restoration to make a difference? The only way is using nature to restore nature.”

## Not a panacea

Not everyone appreciates the beavers’ hard work. Beavers and humans are the two species that most directly impact streams and floodplains, so conflicts are no surprise. Not only did humans drain floodplains, but those relatively level areas often became prime locations for infrastructure — canals, railroads, roads, even sewer lines — all of which can be disrupted by beaver ponds.

Road crews nationwide are estimated to spend more than \$100 million a year dealing with beaver problems.

Road culverts are a particular problem because the sound of water rushing through the narrow openings attracts beavers who treat it as a leaking dam and seek to “patch” it.

“It’s almost like a beaver magnet,” said Deborah Landau, a conservation ecologist with The Nature Conservancy who has helped address beaver problems near conservancy properties in Maryland. “All of these things together are why beaver-human interactions tend to be negative interactions.”

Flooding can often be managed by installing beaver-tricking devices. Typically, they include pipes that drain water from



*A beaver pauses while working energetically in a Maryland woodland. (Dave Harp)*

the top of a beaver pond — limiting the height of the water — and send it downstream, usually underwater so as not to alert the beavers.

One study in Virginia found that every \$1 spent on flow control devices at culverts saved more than \$8 in beaver-related maintenance expenses.

Still, beaver boosters acknowledge that there are places where the rodents will never fit in. The Beaver Institute, a nonprofit that seeks to build awareness of the beavers’ ecosystem benefits, estimates that trapping remains the most viable option for about 25% of conflicts. Removing beavers is ongoing job, though, because they continue to move in.

Another concern is the impact beaver dams could have on fish movement. Beaver advocates don’t believe that’s a problem, noting that peak beaver populations coincided with peak populations of migratory fish that once packed the region’s rivers.

Evidence from Western states also suggests beaver improvements to stream health outweigh other impacts. Some fisheries scientists caution that may not be true for wetter Eastern aquatic environments, though. With the poor condition of some species, including river herring, shad and brook trout, they worry that even slight impacts could have ramifications.

Several years ago, Greg Garman, director of Virginia Commonwealth University’s

Rice Rivers Center, participated in a small project in the Rappahannock where river herring were trying to migrate past beaver dams. “On several occasions, I was able to watch blueback herring wiggle their way through a beaver dam. I probably wouldn’t have believed it unless I saw it myself.”

But, he said, while it was “technically possible” to get past, it also didn’t appear that many were doing so. Still, he said, the issue warrants more study.

## Incentivizing beaver recovery

The demise of beavers more than a century ago gradually gave way to efforts to return them to once-lost habitats.

Pennsylvania began reintroductions in 1901, and Virginia began a few decades later. The most innovative restoration was by Idaho, which in the 1940s returned beavers to remote habitats through parachute drops.

Though far below historic levels, populations have rebounded. But their restoration potential remains huge, if people can learn to live with them. To incentivize that, McGill and others are working on a proposal that would give local governments and landowners nutrient reduction credits toward Bay cleanup goals for having beaver dams on their property.

Their idea is simple and far from novel: Such credits are given for land planted in trees, turned into stormwater detention

ponds, or transformed by stream restoration projects. Why shouldn’t land covered by a beaver pond, especially if it is part of a restoration project, be treated differently?

Michelsen said that nutrient reduction credits would help local governments and others to put a price on beaver benefits.

That could lead local governments to make land use decisions with beavers in mind. They might, for instance, provide additional protection for low-lying areas already susceptible to flooding in anticipation that beavers will eventually arrive and spur an effective floodplain. Land conservation programs might target those areas as well.

“So much of what we do, whether in business or in government is really trying to do a cost-benefit analysis,” Michelsen said. “We know pretty well what the costs are, whether it be having to trap beavers out or to take steps to adaptively manage them or replace infrastructure that might be at risk. But we don’t have a sense of the quantifiable benefits. So, it’s really an attempt to sort of even that scale.”

But figuring out how much nutrient reduction credit to give beaver ponds will be a challenge — especially because their size and location can change each year.

David Wood of the nonprofit Stormwater Network coordinates the state-federal Bay Program’s stormwater workgroup. He said crediting beaver ponds was an “interesting concept,” especially as evidence of ecosystem benefits accumulates, but that, “as with anything, I think the devil is in the details when it comes to crediting potential.”

Nonetheless, with the region far off track toward meeting its 2025 Bay cleanup goals, people are seeking new ways to get the job done — and it’s not the first time the idea of enlisting beavers has surfaced. In the early 2000s, Rebecca Hanmer, then director of the U.S. Environmental Protection Agency’s Chesapeake Bay Program office, was visited by a scientist from who talked about beavers benefits.

As she listened, she began to understand how beaver dams remove nitrogen from stream systems similar to the technologies used at wastewater plants. “The epiphany was the similarity between how he was describing the matrix of a twig-created beaver dam and what the engineers were designing to sell for big bucks as biological nitrogen removal,” she said.

Hanmer arranged for the scientist to speak at a Bay Program staff meeting. “That day, people just looked at me and him like we were crazy,” she said. “That was a long time ago. Things change. Maybe some things at least can change for the better.” ■



# DE climate plan trails neighboring states' pledges

## State urged to make larger emission cuts

By Jeremy Cox

Delaware Gov. Jay Carney unveiled in early November the state's most comprehensive plan yet to reduce greenhouse gas emissions and slow the effects of climate change.

One of its top priorities is reducing the state's greenhouse gas emissions. By the administration's own admission, though, it's not a very ambitious plan.

"Modeling indicated that, with no further action, Delaware's net emissions would decline by 25% from 2005 levels, falling just short of the state's goal of 26–28% emissions reduction by 2025," state environmental officials disclosed in the 112-page report.

Some environmentalists say they were disappointed that Carney, a Democrat, didn't propose a tougher emissions-reduction goal. The 26–28% target matches the pledge set in the 2015 Paris climate agreement that has been adopted by 196 nations and the European Union.

"While we're thrilled the governor [aligned the plan with] the Paris accord reduction goals, we don't have to do very much to meet those goals," said Sherri

Evans-Stanton, director of Delaware's Sierra Club. "So, we want to see much more of a commitment on the state's part to reduce greenhouse gases."

The plan says that by taking "practical climate actions," the state can realize a steeper cut in the future — a 40% decrease by 2035, compared with 2005 levels.

But that would still fall short of the targets adopted by most mid-Atlantic states. Maryland has put in place a 40% reduction goal by 2030, five years sooner than the Carney plan. New Jersey and Pennsylvania have each set 80% cuts to be met by 2050. State officials concede that Delaware would likely need to implement more varied, stringent goals to keep pace with its neighbors.

Meanwhile, some critics faulted the plan for laying out general actions, rather than specific steps, to help communities arm themselves against rising seas, heavier rainfall and other expected climate impacts.

Still, one of the state's top climate experts said the plan presents a realistic way forward for combatting climate change on several fronts.

"It does what I think we should be doing, which is what can we do about these changes that are happening," said John Callahan, a climatologist at the Delaware Geological Survey. "I think it's a very good plan. Are they sufficient for Delaware? Yes. It will reduce the amount of greenhouse gases by a significant amount and help us adapt to the impacts we've been seeing."

Peggy Schultz, head of the climate change and energy committee of Delaware's League of Women Voters, said she appreciated the plan's tendency toward broad recommendations over micromanaging.

"It's going to point us in the right direction," she said. "You have a lot of options, so we can go any number of ways. It's not maybe as prescriptive of a plan as some people would have liked, but it's a very democratic plan. It's very open-ended."

The plan, for example, outlines several actions to encourage offshore wind development, such as coordinating with neighboring states to set uniform policies



Delaware's largest source of greenhouse gases has shifted from electricity generation to transportation as power plants have increasingly turned to burning natural gas instead of coal. (Dave Harp)

and upgrading the electricity grid to accommodate the new source of energy. But it doesn't set a timeline or specific goals for the amount of power that should be generated by wind.

That's fine, Schultz said.

"If [the climate plan] was prescriptive, I don't think it would have seen the light of day," she said.

The Department of Natural Resources and Environmental Control developed the plan over the course of a year, with some of the policies shaped by feedback from more than 250 participants in public hearings conducted in March 2020, and about 400 more in October that year.

It isn't Delaware's first climate plan — that would be the 2000 strategy that called for a 7% reduction in emissions from 1990 levels by 2010. But an update was critical, said Susan Love, head of DNREC's sustainability and climate section. Over the past decade, for example, the state's largest source of greenhouse gases has shifted from electricity generation to transportation as power plants increasingly turned to burning natural gas instead of coal.

Love said she expects the state to exceed its 2025 emissions goal. Carney pledged in 2017 to meet or exceed the 26–28% target, joining a coalition of 24 states to do so after then-President Trump announced the country's withdrawal from the Paris Agreement. (Hours after being sworn into office last year, President Biden, a former U.S. senator from Delaware, officially recommitted the U.S. to the landmark accord.)

Love defended the selection of the Paris target, saying that the Carney administration's plan creates a blueprint for actions the state can take to reduce emissions for years to come. In the transportation sector alone, actions such as offering incentives to buy electric vehicles and setting a low-carbon fuel standard can reduce greenhouse gas emissions by more than 1.8 million tons by 2050, the plan suggests.

"State action is critically important to meeting our nation's goals and meeting global climate change goals," she said. "The things we do in Delaware are extremely impactful even though we're in a small state."

Delaware lawmakers have taken some climate steps, such as requiring utilities to derive 40% of their energy from renewable sources by 2035 and joining the Northeast's carbon cap-and-trade program, known as the Regional Greenhouse Gas Initiative. But some climate advocates worry that without the power of law to support them, Carney's emission-reduction goals could be ignored or even scrapped by future leaders.

"We're kind of in the backdoor committed to this," said Schultz of the League of Women Voters.

Carney's plan is a "good start," said Evans-Stanton of the Sierra Club. Now, she said, she and her fellow advocates need to press for stronger targets and work to translate what's on paper into concrete action.

"The question is, 'Is it enough in the time that we've got?'" she said. "And we're saying, 'We've got to do more.'" ■



Peggy Schultz, head of the climate change and energy committee of Delaware's League of Women Voters, said that the state's climate plan "is going to point us in the right direction." (Dave Harp)



# Community volunteers breathe new life into Minnie's Island

## Stewardship efforts aim to encourage visits to Potomac River island

By Whitney Pipkin

On a stretch of the Potomac River flanked by multimillion-dollar homes is an 8-acre island featuring a rustic cabin — and a lot of potential.

Until recently, its prospects were hidden beneath two decades of overgrowth. But a newly minted Minnie's Island Community Conservancy has been unearthing its natural character and dreaming about its future.

"This place will be spankingly beautiful," said Pascal Pittman, a 70-year-old architect with as much energy as his black Labrador sidekick, Cayenne, during a tour of the island on a sunny first day of December.

When Pittman, who lives in Cabin John, MD, started the local group less than a year ago, nonnative Japanese honeysuckle and oriental bittersweet had long since hidden the walking trails that once existed on the island. The trees were entangled in vines that were beginning to take over a 1940s era cabin, too.

Even before the group secured nonprofit status this year, the volunteer power of about 140 people had begun sprucing it up.

"The whole purpose of this is to maintain the island and the cabin, but, more importantly, to make it available," Pittman said.

Technically, Minnie's Island has been open to the public since 1994, when its owners gifted it to the Potomac Conservancy, which had been formed only one year earlier. In the years that followed, the conservancy hosted river cleanups and educational events at the site.

But in recent years, the nonprofit's work has expanded beyond the Potomac's shores in southern Montgomery County; it now encompasses clean water initiatives and policies for the entire river. So, when Pittman reached out with an interest in creating a local group to care for the island, it seemed like a good fit. The Potomac Conservancy plans to transfer ownership of the land to the Minnie's Island Community Conservancy early this year.

Part of an archipelago, or string of islands, the land measures 8 acres on the deed, but less than 3.5 of those acres are above the water's surface most of the time. The cabin straddles some of the large rocks that make up the island's topography.

The high points of the island's topography



*Minnie's Island sits amid a string of other islands in a wide, quiet section of the Potomac River near Cabin John, MD. (Whitney Pipkin)*

offer breathtaking views of the wide river, and its low-lying areas are strewn with shells left behind by high water, which also accounts for the rocky island's ecology. On one cleanup day last year, volunteers discovered a rare plant — racemose goldenrod, listed as highly rare in Maryland — growing out of one of the rocks.

Many of the island's other treasures are found in its storied past.

Minnie's reportedly gets its name from Minnie M. Jenkins, who owned the island in the early 1900s. Jenkins owned an eatery in Great Falls, VA, and was rumored to have run a speakeasy off the island before her death at age 35. The island was sold in the 1920s to a zoologist who collected "spiders and other things," some of which had never been identified, according to a 1994 *Washington Post* article.

A banker who took boys' clubs to the island for outdoor adventures owned it next, and then came Henry Reuss, a Wisconsin congressman from the mid-1950s to the 1980s. Reuss's son, Christopher, loved the island so much that he spent two years living in the cabin that had been built there in the 1940s — pumping water from a well, installing a wood stove for heat and canoeing to shore to work at a law office downtown.

Christopher Reuss died in 1986 in a

kayaking accident at age 43, the *Post* article said. When the Reuss family donated the island to the Potomac Conservancy in 1994, they did so in his honor, commemorating it with a metal plaque nailed to an island rock.

Minnie's Island is still a quiet, wild place today — but for the occasional air traffic — tucked inside an otherwise bustling Capital Beltway around Washington, DC. Visitors can launch their boats from a shoreline near Lockhouse 8 on the C&O Canal Towpath and paddle to Minnie's in five minutes. Cayenne, Pittman's dog, prefers to swim.

Pittman began frequenting the island 25 years ago when his three now-adult children were young. After architect work took him to Morocco, he returned to find the island in notably less visitor-friendly shape.

"I talked to my community and said, 'Would you guys be interested in sort of adopting this island if we could make it work?'" Pittman said. "I got an enthusiastic response."

Pittman's effort picked up steam and co-conspirators during the pandemic, as people began to appreciate nearby natural spaces all the more. Jack Mandel, a neighbor who works in construction, was one of them.

"When we first came out here, you couldn't walk 15 feet onto the island," said Mandel. "We've got a toehold now."

The group has a vision, too. Along with keeping the island open to anyone who wants to paddle or wade to its shores, they want the land to be a resource that gives back to those who have given much.

At the top of that list is making it a retreat for Team River Runner, a local nonprofit that organizes paddles for veterans, with adaptive options for wounded warriors. Other beneficiaries of the getaway space could be first responders, frontline workers and "folks at the lower end of the economic ladder, who don't have a cabin to go spend the weekend at," Pittman said.

Of course, having a comfortable place to sleep on the island will require a little more work. The 450-square-foot cabin with a large deck is structurally sound but has neither electricity nor running water. The group recently installed a new wood stove for heat. Future plans include solar panels, plumbing and a composting toilet. A 30-foot-deep well on the island looks like it could be resurrected, too, Mandel said.

"This is gonna be adorable, cute and charming when we're done," Mandel said, taking in the vista from the island. Then, referring to the former owner of the Washington Redskins football team, who once lived in a mansion overlooking the Potomac, "Dan Snyder's got nothing on this view." ■



# Low-altitude jet training protested as threat to 'PA Wilds'

## Residents, officials fear disruptions will impact wildlife, tourism

By Ad Crable

A dogfight has erupted over the proposed use of the skies over much of what is collectively known as the PA Wilds, Pennsylvania's largest assemblage of natural areas and an ambitious eco-tourism experiment.

The Maryland Air National Guard, saying it has nowhere else to train, wants to use 2,287 square miles of airspace above six remote north-central Pennsylvania counties and small parts of two New York counties as a training area for pilots of its ground-attack jets. The often treetop-level training flights could occur as frequently as 170 days a year.

But many residents and officials in the area fear the noise from the jets will alter their way of life, rouse livestock and wildlife, and harm a thriving outdoors-oriented economy.

The Air National Guard, the state-organized reserve arm of the U.S. Air Force, calls the training airspace crucial for keeping pilots combat-ready "for current and future conflicts." The low-level training is necessary because A-10 Thunderbolt II jets, better known as Warthogs, are designed for use close to the ground, attacking tanks and other enemy targets in support of ground troops, the military says.

Careful not to appear unpatriotic, the area's Congressional representatives, state legislators, local officials, state resource agencies, tourism businesses, residents, and even Pennsylvania Gov. Tom Wolf have raised economic and environmental concerns about the plan and in some cases angrily oppose it.

"We recognize the need for training opportunities with the Air National Guard but have serious concerns regarding the cumulative impacts to the quality of life and economy of the PA Wilds region," Cindy Adams Dunn, secretary of the Pennsylvania Department of Conservation and Natural Resources, wrote to the military when the proposal was announced in 2019.

In a letter to the Air National Guard, Wolf said the "proposed actions could have significant impacts on the health, quality of life and livelihoods of those who live, work and recreate in this region."



*An A-10 Thunderbolt II attack jet, commonly known as a Warthog, conducts a training exercise in New Jersey. The Maryland Air National Guard is running into opposition over its plan to fly the jets at treetop level in a sensitive natural area in northcentral Pennsylvania. (Hunter Hires/U.S. Air National Guard)*

This latest wave of criticism came after the Maryland Air National Guard in November announced the results of its own limited environmental assessment, saying the jet training would have no "significant" impact on communities, wildlife or the tourism industry.

The Guard did shrink the original air space plan somewhat and promised not to fly too low over state parks, state forests and sensitive natural areas, and not to fly during prime hunting times.

A public comment period for that draft environmental assessment ended Dec. 31 and if the Federal Aviation Administration signs off on the plan, the Guard said, training flights could begin as early as fall 2022.

But opponents have launched a late-hour full-court press to force the military to do a full environmental impact study on the project and to hold in-person public meetings in each affected county before making a final decision. They say many residents in the area still aren't aware of the plan.

The Maryland Air National Guard and National Guard Bureau, according to spokesman Capt. Benjamin Hughes, will review all comments made on its environmental assessment before deciding whether to conduct a full environmental impact study and hold public meetings.

"This is not a one-time air show. We are a hugely patriotic region and respect and value our military. But there is potentially a

lot at stake for rural Pennsylvania with this proposal, and it is important for us to ask for more due diligence on it," said Ta Enos, CEO of the nonprofit PA Wilds Center for Entrepreneurship.

The PA Wilds is a public-private venture that promotes a 13-county region as an outdoor recreation destination. The DCNR has invested more than \$180 million to date to encourage public recreation. The effort has been recognized nationally as a tourism destination and regional economic hub. It currently is a finalist for up to \$60 million in federal grants to augment its outdoors industry.

The region has two Wild & Scenic Rivers, five state parks, hundreds of thousands of acres of state forests, hundreds of miles of land and water trails, the largest elk herd in the Northeast, the most remote wild area in Pennsylvania, the state's only national forest, and a dark-sky state park that is recognized as one of the best places in the world to see and photograph celestial objects. Tourists spent an estimated \$1.8 billion in the region in 2019.

Much of the area in question has been designated as training airspace since 1979, when the New York Air National Guard used it for high-altitude training for its Warthogs. And for years the 175th Wing of the Maryland Air National Guard, stationed at the Warfield Air National Guard Base at Martin State Airport near

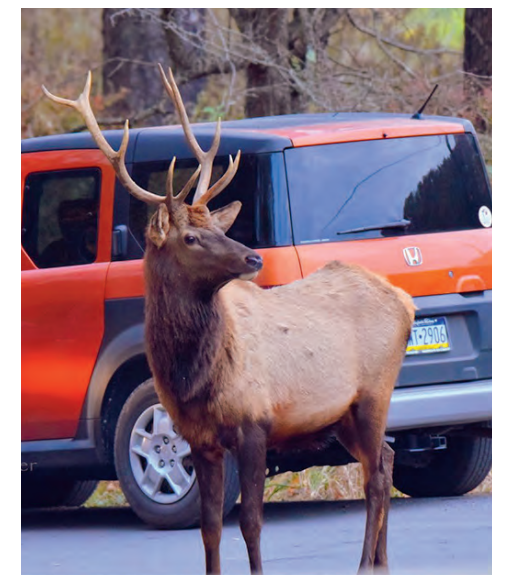
Baltimore, has used the Pennsylvania airspace to train Warthog pilots in its 16 jets — but only at altitudes of 6,000 feet or more, except in a few narrow one-way corridors.

Low-altitude training by the 175th Wing has mostly been done in an annual training event at the Davis-Monthan Air Force Base in Arizona. But that faraway base has been deemed too impractical and expensive for regular training and testing, spokesman Hughes said.

The Guard explored using restricted airspace above the U.S. Naval Air Test Center in Maryland, but that option was ruled out because it was mostly over water and not a realistic training ground. The 175th Wing has been deployed to combat zones six times since Sept. 11, 2001, to protect ground troops.

Training flights, or sorties, could occur four hours per day up to 170 days a year, with up to six Warthogs at a time. Typically, according to the draft environmental assessment, the sorties would last about an hour, between 10 a.m. and noon, and then for another hour sometime later in the day. Weekend and nighttime low-altitude training would be limited.

Practice runs below 1,000 feet would last about 10 minutes per sortie, according to the Guard's proposal. The lower altitude sorties, down to 100 feet, would be two to three minutes in duration. Additional Air National Guard squadrons from around the country might also be permitted, on request, to use the new airspace in similar fashion. ■



*People flock to the PA Wilds region of north-central Pennsylvania to see the largest elk herd in the Northeast. (Linda Stager)*



# Baltimore area stormwater regs face legal challenge

## Environmental groups say permits don't do enough to curb pollution

By Timothy B. Wheeler

Two environmental groups are challenging new stormwater management requirements that Maryland regulators have issued for Baltimore City and Baltimore County, arguing that they fall short of what's needed to curb worsening climate-driven flooding and reduce polluted runoff.

Blue Water Baltimore and the Chesapeake Bay Foundation filed petitions Dec. 6 in city and county Circuit Courts seeking judicial review of stormwater discharge permits finalized in early November by the Maryland Department of the Environment.

These MS4 (municipal separate stormwater system) permits require localities to reduce pollution and flooding caused by rainfall running off buildings and pavement. Under the federal Clean Water Act, the MDE is supposed to review and reissue them every five years. The MDE also issued permits in November to Anne Arundel and Montgomery counties.

MDE officials said this round of permits includes new requirements for getting a handle on road-salt usage impairing streams and for tracking down sources of



Amanda Oxendine and Matt Cherigo, pollution control analysts with the Baltimore City Department of Public Works, check water quality in Gwynns Run in 2019. (Dave Harp)

PCB contamination. But activists said they fall short on requiring actual reductions in runoff or pollution.

Blue Water Baltimore said that its water quality monitoring over the last decade shows previous stormwater measures required by the MDE have failed to improve the health of area streams and the harbor. The new MS4 permits are likewise flawed, the organization said, because they don't emphasize streamside tree plantings and other natural stormwater management practices that would both ease flooding and reduce pollution.

In recent years, there has been growing evidence that climate change is causing increasingly intense downpours and flash flooding, the two groups said.

A law passed by the state legislature in 2021 requires the MDE to assess the latest precipitation and flooding data and update its stormwater control requirements. The department issued a report in November outlining plans to work with all affected parties during 2022 and adopt new regulations in 2023. The environmental groups said the MDE shouldn't wait to begin requiring more runoff controls.

"Residents of Baltimore City and Baltimore County have felt the impacts of the increased intensity of storms due to climate change," said Josh Kurtz, the Bay Foundation's Maryland executive director. "MDE's failure to adequately address climate change in these permits will likely lead to even more damage to both human health and the health of our waterways in

the future."

In announcing the new MS4 permits, MDE Secretary Ben Grumbles said they contain "aggressive and achievable" stormwater management requirements for Maryland's largest localities. He said they would help to prevent stormwater pollution, reduce flooding and increase climate resiliency and equity.

Baltimore City and Maryland's 10 biggest suburban counties have struggled to meet the requirements of their most recent MS4 permits, particularly the mandate that they capture or treat the runoff from at least 20% of their built surfaces. Local officials cited the costs and logistical challenges involved. All but one jurisdiction — Prince George's County — succeeded, though not without help from the MDE. State regulators allowed Baltimore city officials to rely on street sweeping, for instance, as a less costly alternative for treating runoff. They also significantly boosted the credit awarded for reducing stormwater pollution through stream restoration, thereby reducing the number of such costly, complicated projects a locality would have had to complete by the end of the five-year permit period.

The new permits ease that requirement, calling on the large localities to collectively treat runoff from another 10% of their built surfaces, at an approximate rate of 2% per year. Although only half of the rate required in the previous permits, MDE officials point out that it's a cumulative increase in management because the localities

must still maintain treatment measures taken earlier.

The new permits also allow continued reliance on street sweeping and stream restoration, though the use of the former is capped. MDE officials say research shows both can be effective at reducing nutrient and sediment pollution, a contention disputed by some.

In any case, the two groups say there's too little emphasis in the permit on measures that would address not just the pollution from stormwater but the flooding caused by increased rain and runoff.

"At the end of the day, street sweeping isn't going to do anything to reduce stormwater runoff or keep our neighbors safe from flooding," said Alice Volpitta, Baltimore Harbor Waterkeeper, which is part of Blue Water Baltimore. "And without better permits, municipalities are going to keep putting on a bandage instead of investing in real change. MDE needs to be leading the way into the future, not maintaining the status quo."

The groups also take issue with the different targets given to each jurisdiction for treating runoff from buildings and pavement. MDE officials said they adjusted each locality's target based on an assessment of its circumstances, including geography, density of development and financial resources.

But the permits place a much bigger burden on financially strapped Baltimore City than its wealthier neighbor, Baltimore County, the groups pointed out. The city would be required to treat more than 3% of its built landscape annually, while the county's target is substantially less than the 2% overall target for all of the large localities.

The group contended that disparity allows "upstream communities, often white and affluent, to save money by making fewer environmental investments, to the detriment of downstream neighbors, including those in Baltimore City."

In response to the groups' legal challenges, MDE spokesman Mark Shaffer said the agency "has worked closely with all interests to keep making progress for clean water, green infrastructure, climate resiliency and equity in the new permits. We understand some groups wanted more, just as some groups wanted less based on concerns about affordability and achievability. MDE will continue to work with all groups and focus on the need for timely implementation." ■



Baltimore city relies on vacuum-powered street sweepers, like the one shown here with its operator Alonzo Ames, to pick up dirt, litter, sediment and other pollutants. (Dave Harp/2019)



# Trout Unlimited group keeps fish habitat going for 36 years

## PA volunteers shovel limestone to fight acid drainage from old mines

By Ad Crable

Every week for almost 36 years, a group of mostly older adults with a Pennsylvania Trout Unlimited chapter have performed an unheralded but vital task: keeping Stony Creek, the state's first designated scenic river, livable for fish.

They drive, bicycle, cross-country ski or snowshoe — whichever is necessary — 4 miles into Pennsylvania's second-largest roadless area, where they take turns hurling 160 shovelfuls of limestone gravel into two round, grate-covered holes in the ground.

From there, gravity and physics take over and do a remarkable thing. Water tainted with acid mine drainage from adjacent Rausch Creek, Stony Creek's primary tributary in northeast Lebanon County, is diverted by pipe into the limestone-filled wells. The churning limestone rocks both remove the acidity and send a plume of dissolved limestone downstream, raising the pH in Stony Creek.

The now-alkaline water counteracts the lingering mine pollution and enables trout and other aquatic life to survive in the gorgeous wild stream for about 20 miles, until it joins the Susquehanna River above Harrisburg. Without the regular dose of limestone, trout stocked in the stream — and now sometimes reproducing — would die within weeks.

The Swedish-design treatment system, originally installed by the Harrisburg area Trout Unlimited Doc Fritchey Chapter volunteers in 1986 and expanded in 2000, is believed to be the first limestone diversion well built in the U.S.

Several generations of volunteers with the conservation group have doggedly kept the effort going all these years. Some are gone, and many no longer even fish but do the work to give something back to their cherished pastime.

"I'm thankful that we can do something that makes a difference in the world," said George Dobson, who showed up on a chilly December Sunday along with nine others and a black Labrador retriever for the maintenance ritual. "And this makes a difference, even if it is a small difference. You don't do it because you have to, you do it because you should do it."



Volunteers with the Doc Fritchey Chapter of Trout Unlimited heave limestone into a doser so that trout can live in about 20 miles of Stony Creek, Pennsylvania's first designated scenic river. (Ad Crable)

Andy Link, a relative youngster at 39, is a graphic designer who cut his flyfishing teeth on Stony Creek. About four years ago he came across the limestone crew, learned of their mission and was hooked.

"The fact that there is no electricity or automation involved and everything works off of Mother Nature and gravity and human engineering is just kind of mind-blowing," he said.

"You have to believe in what you're doing," said 78-year-old Rick Frazier, a retiree like most of the others in the group. "This helps all wildlife, not just trout."

Larry Herr, a farmer and octogenarian, is known as "the old man of the woods" to the others because he still roams these mountains daily. He describes himself as a "redneck environmentalist." His great-grandmother used to be the postmaster of Cold Springs, a long-vanished mining boom town not far from the limestone wells.

Herr has helped with the weekly tending of the limestone "doser" for two decades "because it's the right thing to do."

Stony Creek is an extremely popular put-and-take trout stream in neighboring Dauphin County, where it exits Saint Anthony's Wilderness on State Game Lands 211. But in the 1980s, the Pennsylvania Fish and Boat Commission noticed something disturbing in their stocking effort there: Trout were going belly-up within weeks of being stocked.

An analysis showed that Rausch Creek,

two branches of which come together to become Stony Creek north of Fort Indian-town Gap, was carrying acid mine drainage, making it too acidic to support trout. The yellow-colored pollution emanated from long-abandoned deep coal mines of the early 1800s, as well as from waste coal piles on the surface and strip mines on a nearby ridge. Acid rain was once a factor, too, though federal air pollution laws have largely ended it.

A fish and wildlife research unit that included Penn State University, Pennsylvania's game and fish commissions and the U.S. Fish and Wildlife Service proposed a possible solution. The Doc Fritchey Chapter eagerly signed on, obtaining all of the needed materials and providing free labor and equipment for the experimental limestone diversion well. And they volunteered to keep the doser running.

The results have been nothing short of amazing, they say. Not only do stocked trout survive unless hooked by an angler, but the improved water quality has allowed trout to hold over from one season to the next and reproduce in the wild. The first stop for the Doc Fritchey volunteers when they get to the diversion wells is to climb a narrow bridge over Rausch Creek and look for small, wild brook trout.

"When you look down off the bridge and see the brookies, it's like, whoa, we're doing something here," 74-year-old Joe Notarangelo said.

"Stony Creek was dead. Nothing was alive

in it. And we brought it back," noted Bob Bauer, 69. "When I heard about it, I said, 'I've got to keep that stream alive.'"

They have kept the dosers working through thick and thin. Last fall, a huge oak tree toppled in a windstorm, rupturing the cast iron diversion pipe and sending a geyser into the forest. It was quickly repaired.

The chapter persuaded Pennsy Supply to donate the limestone rocks from its quarry and Sensenig Masonry to deliver it to the wells.

But everything else — feeding the limestone into the wells, clearing leaves from the diversion pipe intake and other tinkering — the volunteers do without fail.

It's a social event as well as a work detail. Donuts and coffee served from the bed of a pickup or SUV are the reward after scooping limestone. Somehow, word of the weekly open-air coffee klatsch made it to a website used by through-hikers on the Appalachian Trail, which crosses the creek nearby. Hikers began showing up each week for the "Dunkin' Donuts stop on the AT."

Architect Joseph Connor, 52, one of the younger members of the crew, is focused on keeping the Stony Creek revival going.

"We joke about it being a science fair project, and it was," he said. "At some point all of us won't be here, but the wells probably will be. We have to get another generation involved. There are no manuals. It's all shared knowledge." ■



This manually operated limestone doser on Rausch Creek in Pennsylvania neutralizes acidity that lingers from past coal mining and would otherwise devastate fish habitat. (Ad Crable)



# It's a reef thing: FL oyster study yields clues for Chesapeake

## Dense bivalve beds in right locations can clean up water

By Timothy B. Wheeler

**C**an restoring oysters in the Chesapeake Bay and its rivers really help clean up polluted waters?

For many engaged in the struggle to save North America's largest estuary, it's an article of faith to answer that question with a resounding yes. Maryland, Virginia and the federal government have invested \$76 million so far in trying to rebuild and repopulate oyster reefs in just six of the Bay's tributaries.

But with oyster populations worldwide much diminished, real-world evidence has been lacking to support the belief that restoring shellfish abundance will greatly benefit water quality — until now.

A research team led by the University of Maryland Center for Environmental Science has found a place along Florida's Atlantic coast, near St. Augustine, where oysters grow so thickly that they resemble what Capt. John Smith and other European settlers reported finding in the Chesapeake Bay in the early 1600s.

Close analysis of the number and density of oysters in Florida's Guana, Tolomato and Matanzas rivers and the locations of their reefs indicates that the bivalve population there filters 60% of the water in that small, somewhat protected system in a little less than two weeks' time, researchers concluded.

"If you were to restore oysters to historic levels, this is the affect they would have," said Matthew Gray, an oyster researcher at UMCES' Horn Point Laboratory. He is lead author of the study, published in November in the journal *Estuaries and Coasts*.

It's been more than three decades since Roger Newell, another oyster biologist at Horn Point, now retired, stirred imaginations by estimating that the Bay's oysters had been so plentiful before 1880 that they could filter all of the estuary's water in less than a week. His study and other similar ones helped inspire efforts to restore the Chesapeake region's bivalve population, now thought to be just one or 2% of historic levels.

For Gray, the Florida study provides some contemporary evidence of the role oysters can play in water quality.



*Matthew Gray, a scientist at the University of Maryland Center for Environmental Science, sits on a huge pile of oyster shells at the center's Horn Point Laboratory. (Dave Harp)*

Gray had been quoted in a 2020 *Bay Journal* story puncturing the oft-repeated claim that an oyster can filter up to 50 gallons of water per day. While maybe true under ideal conditions in a lab, he said, studies indicate individual oysters in the wild siphon water through their gills at a far lower rate: 3 to 12.5 gallons per day.

That news story, which Gray likened to "popping somebody's bubble," bothered some Bay advocates, who feared it would undermine public support for oyster restoration.

After the story appeared, Gray said, another oyster researcher contacted him and suggested taking a look at the densely populated reefs in the Guana Tolomato Matanzas National Estuarine Research Reserve. The reserve protects 76,760 acres of land, reefs and water along nearly 40 miles of the Atlantic coast between

Jacksonville and St. Augustine.

"I've been going [there] and looking at those reefs for quite a long time and trying to get other people interested," said Raymond Grizzle, research professor of biology at the University of New Hampshire, who grew up in Florida.

So, Gray and Grizzle teamed up with some Florida scientists to study the oyster community there and try to quantify its impact on water quality. They found that, collectively, those oysters can do a great deal, even though they each filtered a little less than 16 gallons per day, on average.

"Oysters each may not filter up to 50 gallons of water daily," Gray said, "but if there are enough of them out there, meaning a whole lot, they can clean up the water."

They don't need to carpet the bottom of the estuary, either. In the Florida reserve, the oysters, many on intertidal reefs along

the shore, cover only about 4% of the bottom area.

But their extent didn't matter as much as their density and location, the study found. In the reserve, they were clumped together on reefs at an average density of 1,855 oysters per square meter. That's greater than what's typically found on harvestable reefs in the Chesapeake. Filtration rates varied around the estuary but were highest where water flowed over more than one reef before sloshing out into the ocean.

There are differences, clearly, between the two estuaries. The Chesapeake has a 64,000-square-mile watershed, while the drainage basin of the three Florida rivers is tiny fraction of that — about 200 square miles. The water is warmer year-round in Florida, giving those oysters more opportunities to feed by filtering algae from the water.

But the study's findings nevertheless offer tips to those hoping that a restored oyster population will help clean up the Bay, Gray said.

The mean density of oysters on reefs in the Florida reserve, he pointed out, is vastly higher than the 50-per-square-meter goal set for the efforts under way to restore oyster reefs in 10 of the Chesapeake's tributaries. Fishery managers might also want to take a cue from the study to focus restoration efforts on reefs located where the science shows they could do the most filtration.

"To have really meaningful water quality improvements," he said, "you need to have really dense populations of oysters, and they need to be placed in the right spots."

The study also sends a message to Floridians, said Jen Lomberk, the Matanzas Riverkeeper. That river, which flows through St. Augustine and makes up the lower portion of the estuary, is "a lot cleaner" than some other Florida rivers, she said, but there's no guarantee it will stay that way.

About a third of the three-river watershed is in conservation, while another third is developed. And with that part of Florida among the fastest growing areas in one of the fastest growing states in the nation, the last third of the watershed is "on the chopping block for development," she said.

"I'm hoping that's going to be a powerful tool toward getting more conservation efforts in this area," Lomberk said. "If we want it to stay as clean as it is here, there are some changes that are going to need to be made." ■



# CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

## Fern-tastic Facts

The U.S. Fish and Wildlife Service's 83-page guide, *Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed*, recommends 19 fern species for planting. Here are descriptions of four of these species. (To download the guide, go to [fws.gov/chesapeakebay](http://fws.gov/chesapeakebay) and click on "Resources.")

**Cinnamon fern:** One of the first ferns to appear each spring, this plant gets its name from its woolly (in wet areas), reddish-brown, fertile fronds. In the wild, this 2- to 5-foot drought-tolerant fern is found in woods, marshes, swamps and along streams. It was long ago eaten by Native Americans but has since been found to potentially cause cancer. Ruffed grouse eat its fiddleheads. Yellow warblers and hummingbirds line their nests with the downy wool from its fronds. Brown thrashers and veeries use the whole plant, nesting in the center of it.

**Hay-scented fern:** This is a yellowish green fern, 1-3 feet tall, with feathery fronds that give off a scent of crushed hay in late summer. Found in meadows and sunny openings in the forest canopy, it turns golden yellow in the fall. White-tailed deer apparently do not relish this fern, in part because its foliage is covered with tiny hairs that excrete a sticky substance. This allows hay-scented ferns to form dense colonies in the forest understory, in some cases shading out tree seedlings. Common throughout northeastern and central North America, it is considered a "native invasive" because of its ability to dominate a forest floor under some conditions. It proliferates in acidic soils, giving it an advantage in the Northeast, where soils have become increasingly acidic over the past 60 years.

**Sensitive fern:** This fern's common name is derived from its early sensitivity to frost. Its stalks are said to have a decorative, "beaded" appearance, lending the plant one of its common alternative names, bead fern. Salamanders and frogs will take shelter underneath the foliage and in the cool soil, and its fertile fronds produce a feast of spores for birds. Sensitive fern is poisonous to horses if eaten in large amounts. Deer like to nibble on the infertile fronds, but usually not to ill effect. The sensitive fern has broad, almost triangular fronds, which contrast with the lacy appearance of many ferns. Its fiddleheads, which emerge in the spring, are a pale red.



**New York fern:** Found in forested wetlands, dry to damp woods and thickets, the New York fern is drought tolerant and often grows in colonies of hundreds of plants. It is a soft, deciduous, yellow-green fern that stands 1-2 feet high. It grows in clumps and its fronds, up to 4 inches wide, are distinctive as they taper sharply at both the base and the tip. It can spread rapidly but is relatively easy to control. It is found throughout the eastern United States and Canada but is most concentrated within Appalachia and the Atlantic Northeast.

A. Cinnamon fern (*Antennaria dioica*/CC BY-SA 4.0)

B. Hay-scented fern (*Dryopteris terrestris*/CC BY-SA 3.0)

C. Sensitive fern (*Onoclea sensibilis*/CC BY-SA 2.0)

D. New York fern (*Adiantum virginicum*/CC BY-SA 4.0)

Icon: Young fronds of some ferns are called fiddleheads because of their resemblance to the musical instrument. (Michele Danoff)

## Are you frond of ferns?

Fronds are the feathery leaves of ferns, which are non-flowering, seedless plants. They can be found in moist areas: forests, fields, swamps and near streams. Ferns can survive in various climates and at many altitudes. How wide-ranging is your knowledge of ferns? Answers are on page 44.

1. The study of ferns comes from the Greek name for the plant. What is it?  
A. Brackenology      B. Fernitology  
C. Pteridology      D. Sporanatology
2. Ferns have been around for at least 360 million years and have been found in fossil records all over the Earth. They were an important part of herbivorous dinosaurs' diets. Which of these dinosaurs ate ferns? (More than one answer.)  
A. Ankylosaurus      B. Diplodocus  
C. Stegosaurus      D. Triceratops
3. There are at least 12,000 species of ferns in the world (441 in North America). During their prehistoric heyday, before the appearance of flowering plants, they were even more diverse. For every known modern species of fern, how many more species have been found in the fossil record?  
A. 3      B. 5      C. 7      D. 9
4. The water fern grows so quickly that some scientists are exploring its potential as a tool in fighting climate change. (During photosynthesis, plants take in carbon dioxide, a greenhouse gas, from the air and release oxygen.) Brake fern absorbs arsenic and has been planted in areas to decontaminate soil. Boston fern fights indoor air pollution, removing formaldehyde from the air better than any other plant. It also removes xylene, toluene and benzene. What is the term for the process in which plants are used to remove pollution in the air, soil and water? (Note: The ferns used as examples here are not native to the Bay watershed.)  
A. Biotranspiration      B. Phytoremediation  
C. Plant therapy      D. Verdurepurification
5. How many feet can the tallest fern grow?  
A. 15      B. 30      C. 45      D. 60
6. Ferns reproduce by means of spores, powdery masses of single-cell "seeds" released from capsules under the fronds. Spores can be which of these colors? (More than one answer.)  
A. Blackish      B. Brownish  
C. Reddish      D. Yellowish
7. Long ago, in some cultures, it was believed that eating ferns would allow someone to:  
A. Become invisible      B. Fly  
C. Read minds      D. Talk to animals





A pool in the ice reflects the winter landscape around it. (Dave Harp)

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Fog creates a dreamlike scene along Parsons Creek in Dorchester County, MD. (Dave Harp)

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The exfoliating bark of a river birch is quite distinctive. River birches are frequently planted along shorelines because of their ability to help prevent erosion. (Dave Harp)

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All is calm in south Dorchester County, MD. (Dave Harp)

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## ‘Blizzard’ of snow geese forecast at PA’s Middle Creek

By Ad Crable

No one saw it coming. When Pennsylvania built a 6,400-acre waterfowl haven on farmland in a southeastern nook of the state in the early 1970s, the goal was to bolster then-struggling Canada geese populations and give hunters from the populous eastern part of the state a crack at topnotch waterfowl shooting.

Today, though, Middle Creek Wildlife Management Area attracts many more photographers and tourists than hunters. The object of their affection: as many as 150,000 snow geese amassing on any given day over a month or so in February and March. They are on a 3,000-mile migration from wintering grounds in the Chesapeake Bay region back to their Arctic breeding grounds. Joining them at the stopover are smaller numbers of tundra swans and Canada geese.

The “blizzard of white,” as local residents affectionately call it, gives the illusion that the fields and 400-acre lake are covered in snow. When the birds take off in unison in large waves, the noise of their excited honks and wings chopping water can seem deafening. A collective takeoff is truly one of nature’s stirring sights. A recent witness described it as “like stepping out into the pages of *National Geographic*.” The outburst is invariably followed by dead silence.

The annual spring mass migration of the handsome white birds has made Middle Creek, managed by the Pennsylvania Game Commission, a worldwide destination for nature lovers and shutterbugs.

In recent years, the migration has attracted large numbers of international visitors, especially from China and other Asian countries. At one point, informational signs at Middle Creek were printed in Mandarin, as well as English, Spanish and German.

Many are keen on photography but there are spiritual draws, too, explained Zhen Li from State College, PA. Like 200 others, she had arrived at Middle Creek at 6 a.m. on a Monday in 23-degree temperatures in March 2021 to view the liftoffs.

“They mate for life. The fidelity and loyalty is really inspiring,” said Li, who said that the white birds on blue water made it seem like a cloud had fallen to earth.

Among the others gathered expectantly in the pre-dawn of that morning were four young Amish schoolteachers who wanted to witness what they called “God’s creation” and be back at their small school by 8 a.m.

A retired couple from Pennsylvania had driven



an hour to see the raucous scene for the second time. “It’s such a beautiful thing to see so many snow geese and tundra swans in one place,” Vicki Brickner said. “And when they start to burst, you can’t even put it into words. It’s that amazing.”

On this morning, parents had roused their children out of bed and bundled them in blankets. Some sat in chairs, wearing earmuffs, awaiting the big event. A couple stood with camera tripods on top of a picnic table. A man hunched over a long camera lens had come from Alabama after being told on a bird photography trip in Tennessee that the snow goose scene at Middle Creek is a must-see.

Many visitors seek to witness a sunrise explosion of snow geese. But afternoons are popular, too, when skeins of geese, sunlight illuminating

*Top photo: Visitors gather during a cold March sunrise in 2021 to watch thousands of snow geese make a raucous takeoff at Pennsylvania’s Middle Creek Wildlife Management Area. (Dave Harp)*

*Bottom photo: Hundreds of migrating snow geese pack into the cove of a lake at Middle Creek Wildlife Management Area. (Dave Harp)*



their bodies like globes, fly back to the lake in huge flocks after feeding in area fields.

Middle Creek, nestled in a valley of farmland in Lancaster and Lebanon counties, is called a management area, not a refuge, because snow geese, Canada geese and ducks are hunted from controlled blinds before the migration starts.

But because state taxpayer money helped to create the site, public recreation was also part of the plan. The lake is used for fishing and paddling, and miles of trails go through both forests and fields of the area and surrounding state game lands. A visitor center offers incredible views and exhibits on area waterfowl and wildlife.

The area's diverse habitat makes it a magnet for birders seeking a wide variety of species. The lake has supported pairs of nesting eagles for years. Approximately 33 species of ducks have been sighted, as well as shorebirds. A great blue heron rookery, meadowlarks, bobolinks, short-eared owls and northern harriers are also among the potential sightings.

To provide waterfowl with all that they need for an important rest on their epic migration, land managers constructed the lake as well as shallow ponds and wetlands. Former farm fields were planted with millet, corn and other food that waterfowl forage.

It has worked. Middle Creek opened in 1972 and the numbers of waterfowl stopping by have been increasing ever since.

Tundra swans first appeared on their spring migration in 1976 with about a dozen showing up. Now, you may see about 15,000 in good years and 5,000 in less dynamic years.

The arrival of snow geese started slowly, with only a couple hundred to 1,500 from the late 1970s into the mid-1990s. Then their numbers exploded. Approximately 50,000 were counted in 1995 and 100,000 the next year.

Now, you can expect about 250,000 snow geese to visit Middle Creek from late January into mid-March, when the last stragglers wing north again. The single-day record is 200,000 on Feb. 21, 2018.

Middle Creek has become a vital stop in the migration of waterfowl in the Atlantic Flyway — a major north-south aerial route for migratory birds in North America. Snow geese may have traveled 800 miles before touching down. It's believed that a large percentage of eastern North America's tundra swan population uses Middle Creek as a migratory rest stop.

In 2010, Middle Creek was named a Globally Significant Important Bird Area by the National Audubon Society.

As beautiful a sight as it is, seeing so many snow geese at one location also hints at trouble elsewhere: Snow geese had a population boom in the 1980s and 1990s, at one point doubling in size every eight years, and their exploding numbers threatened to denude historic Arctic



*Top photo: Snow geese lift off at sunrise at Middle Creek Wildlife Management Area in Pennsylvania. (Dave Harp)*

*Bottom photo: Bundled-up visitors watch the mass takeoff of snow geese at Middle Creek Wildlife Management Area. (Dave Harp)*

breeding grounds.

One of the main reasons for the surge was that geese adjusted their migratory flight patterns to feed in farm fields. Also, warming winter temperatures caused fewer die-offs. That means healthier birds are reaching breeding grounds and producing more young.

In 1998, snow geese were declared overabundant by game managers in the U.S. and Canada.

Since then, liberalized hunting seasons and bag limits have stabilized populations. But the shots that ring from surrounding lands at Middle Creek during snow goose watches often startle and confuse the visitors.

Still, as snow geese find equilibrium with the world around them, their spectacular convergence at Middle Creek is an annual marvel of sight and sound. ■

### PLANNING YOUR VISIT TO MIDDLE CREEK

The Middle Creek Wildlife Management Area is open year-round. Admission is free. The visitors center, located at 100 Museum Road, Stevens, PA, is open from February through the day before Thanksgiving, Tuesday through Sunday. For information, call 717-733-1512 or visit [pgc.pa.gov](http://pgc.pa.gov). (Click on "Education," then "Visit Middle Creek.")

Consider visiting on a weekday or early morning to escape the crowds: The last two waterfowl migration seasons have seen unprecedented numbers of visitors. During the first weekend in March 2021, approximately 10,000 people gridlocked roads.

Geese and tundra swans may start showing up at Middle Creek in late January and may stay until the end of March, depending on the weather. In typical years, the peak migration is between mid-February and mid-March. A good way to keep tabs on the gathering is to watch Middle Creek's year-round live camera trained on the lake. Go to [hdontap.com](http://hdontap.com), then enter "PA snow geese" in the search field. The Middle Creek website gives updates on the estimated number of geese and swans at Middle Creek every few days.

There are miles of trails and three picnic areas around the lake. Note that drones are strictly prohibited, and violators have been prosecuted. The most popular spot to view waterfowl is via the Willow Point Trail. The 0.4-mile paved, handicapped-accessible trail leads to a peninsula that juts into the lake. Also popular is the self-guided driving tour that follows a road around the lake, open from March 1 through Sept. 15. The road has seven marked stops, and you can listen to the auto tour at 1620 AM while you drive. Another observation point is at the lake's boat launch at the Red Rock Picnic Area.







## Walk through a mountain in VA's Blue Ridge

By Leslie Middleton

**R**ockfish Gap, at 1,900-foot above sea level, is one of the lowest ridge elevation along Virginia's Blue Ridge Mountains. Today, Interstate 64 and VA Route 250 cross the gap, which offers scenic views of the Piedmont hills and Charlottesville to the east and the Shenandoah Valley to the west.

In the 1850s, though, it was here that the Blue Ridge Railroad tunneled 500 feet under Rockfish gap, right through the mountain. The long, straight tunnel linked communities on either side of the mountains and served as a strategic site in the Civil War. In the 1940s, it was abandoned in favor of a new nearby tunnel that could accommodate larger, modern locomotives.

Just last year, the tunnel gained a new purpose: foot travel. In November 2020, the historic route through the mountains, known as the Blue Ridge Tunnel or Crozet's Tunnel, opened as a public trail. Since then, more than 100,000 visitors have experienced its cool, dark ambience, marveling at what was once the longest tunnel in the United States.

Despite enthusiastic reviews from friends, I was initially reluctant to walk the tunnel. I imagined the unlit, nearly mile-long tunnel would feel unbearably claustrophobic. But my curiosity got the better of me. One bright, fall morning, I joined a loose stream of visitors walking up the wide, crushed gravel trail from

the eastern trailhead parking lot — where signs reminded us to bring a flashlight or headlamp.

My nervousness at entering the dark cavity was quickly overcome by surprise when I saw the tiny but undeniable spot of light peeking through the dark from the distant western portal. This was enough to calm my nerves and assure me that I would be safe walking through rock that has, after all, remained in place for 150 years. The tunnel, at 16 feet wide and 20 feet overhead, felt surprisingly spacious, with plenty of room for two-way traffic, including the occasional bicyclist.



Soon all was dark, save the light from my headlamp. Other visitors approached from the western end or passed me in groups of two and three, their footsteps muffled by the crushed stone underfoot. Our flashlights and headlamps

arced narrow beams from the trail to the tunnel ceiling and back again, creating quick shadows on the rough rock walls.

The darkness made it impossible to see all of the tunnel at once, which helped me imagine teams of laborers in dim light chipping away at the dense metamorphic rock by hand, aided only by dangerous black-powder explosives, horse-power and crude steam engines.

Claudius Crozet, a French engineer who had emigrated to the United States, was hired in 1850 by the state of Virginia to oversee the construction of the 17-mile Blue Ridge Railroad over terrain that Crozet, an experienced public works engineer, called “dangerous ground.” He said had never seen “any section of the same extent more complicated and rugged.”

Though Crozet predicted he would finish the railway in three years, it took more than eight. Four tunnels were needed. The Blue Ridge Tunnel was the longest, boring 4,273 feet straight through the mountain under Rockfish Gap.

Crozet's workforce was almost entirely composed of recent Irish immigrants who had fled poverty and the Great Famine only to find a hardscrabble life along the railroad line. Along with wives and children, they lived in crude shanties huddled against the mountains. Wages were barely enough to purchase the workers' boots and clothing, and families foraged and

*Top photo: The Blue Ridge Tunnel in Nelson County, VA, boasts an elliptical arch at its western portal, framed in limestone. (Leslie Middleton)*

*Bottom photo: Two-thirds of the Blue Ridge Tunnel was hewn through hard Catoclin greenstone and required little structural support, as seen here at the tunnel's eastern portal. (Nelson County, VA / Jack Looney Photography)*



gardened to feed themselves. Pneumonia, tuberculosis, and, in 1854, cholera ripped through the working communities.

The Irish Catholic immigrants were a rough and scrappy lot, prone to fighting, and often in conflict with Crozet, who had little patience for anything that slowed the project. They repeatedly went on strike to protest poor working conditions.

Often, the Irish simply headed west for other work, but they were easily replaced by a steady stream of newcomers and at times by enslaved workers “leased” from nearby plantations. Contracts between Crozet and plantation owners required the enslaved workers to tackle only the least dangerous job: removing stone from the tunnel. At \$150 per leased worker, neither plantation owners nor Crozet could afford to lose these men.

Teams of Irish men, and boys as young as age 10, worked from both sides of the mountain, blasting stone, driving mule teams, and measuring their progress in yards-per-month. Managing the seep of water through the overlying rock was a constant problem. At times, when the novel but temperamental siphon system that Crozet designed couldn’t keep up, workers had to wade through waist-deep water.

Walking through the dark, I tried to imagine sloshing through the unfinished tunnel, dimly lit with oil lamps, noisy with the pounding of hammers on steel drill heads. While most tunnel excavations of that era were ventilated through vertical shafts to surface air, this tunnel was too far below the surface for this option. Instead, Crozet devised a system to purify the air by pumping it through water-filled barrels. Even so, the tunnel bores were often thick with smoke from black powder blasts and the fires at blacksmith sheds.



At regular intervals along the tunnel wall, my headlamp shone on the tell-tale remains of these tubular holes, laboriously drilled by hand then stuffed with dangerously volatile black powder.

Author Mary Lyons has spent the last decade amassing a significant record of the men and families who worked on the Blue Ridge Railroad. At least 13 Irish laborers, including several children, died in gruesome accidents. The records cite causes ranging from “collision of two handcars” and “blowing rock” to simply “blown



up.” When three enslaved workers died in accidents, Crozet had to compensate the slaveholders for their “losses.”

Near the middle of the tunnel, I paused and looked both ways. So close were Crozet’s engineering estimates that when the two sides met on December 29, 1856, the error in alignment between the tunnel cavities was less than 6 inches. Here, where I might have felt most anxious, I felt an unexpected sense of spaciousness as small circles of light from the opposite portals beckoned through the dark tunnel.

The temperature in the tunnel ranges consistently between 55 to 65 degrees year-round, perfect for hiking or biking in any season. But I was glad I came prepared with a light raincoat and water-resistant shoes because groundwater still seeps continually into the tunnel from the surrounding rock. Water drips from above and pools on the trail bed, which is flanked by shallow ditches that divert the water down a slight incline and carry it out of the tunnel.

I aimed my flashlight at a graceful curve overhead hoping to spot some of the special wildlife that inhabit the tunnel. In the winter especially, the nocturnal-feeding little brown bat can be found snuggled into crevasses along the tunnel’s ceiling. The cool and wet cave-like habitat is also home to the brightly colored long-tailed salamander and the pickerel frog.

Closer to the western portal, my headlamp lit up sections of brickwork arching overhead. Unlike the eastern end of the tunnel, this western section required stabilizing by several widths of bricks that were made by workers on site. The portal itself is artfully encased in limestone according to Crozet’s design.

From the western opening, the trail continues through woods for nearly another mile to the western trailhead parking lot near the town of Waynesboro. The trail is occasionally steep,

curving up and down through the woods. In contrast, the eastern trail, from Afton, is “less strenuous,” according to signage, and favored by those pushing strollers or wheelchairs. From one parking lot to the other, the trail totals 2.25 miles including the 0.8-mile tunnel in the middle.

Walking back through the tunnel toward the eastern portal, I encountered an intermittent but steady flow of visitors that included families with strollers, children running ahead and dogs on leashes. Rather than feeling crowded or noisy, it felt communal and friendly. It was as though something about this special dark place inspires good manners.

And the tunnel seemed to absorb sound. Nelson County parks manager Jerry West said it’s like sound in the tunnel is condensed. “You don’t really hear people talking, and you almost feel alone — even if there are 50 other people with you in the tunnel.”

Though the Blue Ridge Tunnel remained closed and unused after it was abandoned by the railroad, it wasn’t forgotten. In 1975, it was designated a National Historic Civil Engineering Landmark. It is recognized today as the longest tunnel in the United States dug by hand using black powder blasting techniques without ventilation shafts.

Even so, it remained closed to the public until the early 2000s, when the Claudius Crozet Blue Ridge Tunnel Foundation urged its restoration and public use. Then came grants, consultations and construction to repair the tunnel and rebuild the trail bed.

Now the tunnel is fully open to the public and increasingly popular. It’s an engineering marvel, where students learn about the techniques that Crozet invented and employed here. It’s a testament to the spirit and struggles of the laborers. And it’s a place where all curious visitors can literally walk through a mountain. ■

*Top photo: Visitors check headlamps as they enter the eastern portal of Virginia’s Blue Ridge Tunnel. A small circle of light from the western portal shows in the distance. (Leslie Middleton)*

*Bottom photo: The wet, cave-like habitat in the Blue Ridge Tunnel is home to the brightly colored long-tailed salamander. (Nelson County, VA / Jack Looney Photography)*

## For information

Visit [nelsoncounty.com/blue-ridge-tunnel/](https://nelsoncounty.com/blue-ridge-tunnel/) or [blueridgetunnel.org](https://blueridgetunnel.org)

Watch *The Tunnel*, a documentary available on YouTube at [youtube.com/watch?v=IRJGKjT-ahQ](https://youtube.com/watch?v=IRJGKjT-ahQ)



## Headed for Hurlock: The rhythm of the Bay 'migration-shed'



### CHESAPEAKE BORN

By Tom Horton

**B**ecause I hail from nearby Federalsburg, I can confidently describe the little village of Hurlock on the Eastern Shore of Maryland as unprepossessing, nothing remarkable, special for nothing much.

No reason, it would seem, ever to head for Hurlock.

Even within Dorchester County, which contains it, Hurlock's flat farmscapes pale before the untrammelled gorgeousness of the great Blackwater marshes and the Choptank, Transquaking, Chicamacomico, Honga and Nanticoke rivers that lavish voluptuous meanderings on other county towns.

And yet, it is to Hurlock — specifically to the sprawling impoundments of its sewage plant — that every late autumn I head with my university classes around sunset to experience one of the great festivals of the Chesapeake Bay.

Gathering there nightly to rest, after foraging far-flung fields and wetlands, are hundreds of tundra swans, thousands of snow geese and Canada geese, squadrons of assorted ducks — all of it a delight for the eye and the ear. And that's just for starters, I tell the class.

From 4,000 miles away, from across Alaska's North Slope, the Bering Sea and the Yukon Territory the swans have come; the geese arrive from Labrador and Hudson Bay, and the ducks from prairie potholes as far off as Saskatchewan in Canada.

What a grand assemblage, as the western horizon fades from deep violet to black and the mellow, haunting hallooing of swans pierces the chill: Drawn from across the continent, the swans are headed for

Hurlock. Having ridden the coattails of big northwest blows, they were likely airborne for 24 hours or more on the final leg of their journey.

It's a bit of a conceit, this "headed for Hurlock" thing, because migrating waterfowl distribute throughout the great estuary. But I love how these hemispheric processions of life grace and enliven the humblest spots of the Chesapeake watershed.

I recall decades ago, exploring with my young daughter a tidal rivulet trickling from around Hurlock to Marshyhope Creek, the main tributary of the Nanticoke River. Pushing upstream in spots no more than a few feet wide were tiny wrigglers, baby eels returning from the Sargasso Sea, far out in the Atlantic Ocean, where all eels in North America go to spawn and die.

It remains more mysterious than the moons of Jupiter just why and how the eels do that, or how their spawn return. It is a remarkable journey, Abby understood, and she asked why they traveled so far.

Well, it's obvious, I told her: They are headed for Hurlock.

We talked about how when I was a kid, schools of alewife and blueback herring thronged these little creeks every April, and how we spent cool spring evenings, campfires lit on the streambanks, dipping the silver fish for their fine-textured roe, salting their flesh in crocks for pickling later on.

The herring spend most of their lives in the continental seas from Nova Scotia to the Carolinas, converging annually to spawn on Chesapeake tributaries where they were born.

Headed for Hurlock. These glad phenomena of migration lend ritual and rhythm, beauty and nourishment to the most nondescript spots — shad returning in April, ospreys in March, great blue herons in February, striped bass in May, monarch butterflies passing through in October. All of these comings and goings embroider the great estuary richly, weaving it into a larger context: the Bay migration-shed.

These far travelers evoke the word synecdoche, the Greek origin of which



*After feeding in nearby farm fields, tundra swans settle in for the night on a treatment plant lagoon in Hurlock, MD. (Dave Harp)*

translates as "simultaneous understanding." Migrations imply that a returning swan or duck or osprey is more than just a lovely creature, about more than just itself.

As the presence of brook trout in a stream betokens a whole watershed in natural enough shape to foster the very cleanest, coolest water, so the return of swans to Hurlock means that any number of way stations on the birds' long journey remain good and natural. It also means that we have a responsibility to steward our portions of the route.

So, when I head for Hurlock with my students, we are looking not just for waterfowl but also for annual proof that wider webs of habitat along their way remain intact. The mellifluous swans, the raucous gaggles of geese, the sassing ducks, all of these are mere entry points, entangling the Chesapeake's 64,000 square mile watershed in a vaster realm.

These annual comings and goings conjure up fundamental rhythms of the Bay itself. Tides moving in and out daily, the constant two-layered movements of fresher, lighter river water flowing south on top as heavier, saltier oceanwater licks north along the Bay's bottom. Geologically, the Ice

Ages drew the oceans back into their basins as glaciers swelled, leaving just a river valley where the Bay was. Then there were brief flowerings of estuaries when warmer interglacials melted the ice and the seas gorged every nook and cranny of the coastlines. Deflating with the ice ages, swollen with the interglacials, our Chesapeake "migrates" to a geologic cadence, water making love to the land.

The landscape joins in, too, autumnally inhaling swans and geese and ducks from across the continent and exhaling them back every spring, and beckoning spawning fish from the coastal seas to thrust up every river, celebrating spring, jazzing the watershed with new life.

So, apologies for having a little fun with Hurlock, where I'm headed this very afternoon. It is not just Hurlock, but a synecdoche, both a humble glimmer in the vaster Chesapeake scheme of things and a critical nexus in the ensorcelling web of life. ■

*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.*



## Latinos support land conservation goal for the Bay watershed

By Shanna Edberg

As the 2022 session of the Maryland General Assembly gets under way, a coalition of environmentally minded lawmakers is expected to propose legislation that would protect 30% of the state's lands and waters by 2030 — in keeping with a nationwide movement known as 30 by 30. As our representatives consider this bill, they should be aware that one of our state's fastest-growing constituencies stands strongly in favor of nature conservation and climate action: Latinos.

During the past decade, the Latino segment of Maryland's population grew from 8% to 12%, according to the U.S. Census Bureau. Latino or Spanish-speaking people are enthusiastic visitors to Maryland state parks, and at some sites they comprise a significant proportion or majority of park users. That makes Latinos a valuable and increasingly important constituency for parks and environmental issues. This growing and dynamic community shares values across party lines and supports protecting our sources of clean air and water, a stable climate and outdoor recreation.

A poll taken last summer highlighted the importance of conservation issues among Latino voters in the Chesapeake region. The poll, conducted by David Binder Research and commissioned by the Hispanic Access Foundation and Chesapeake Conservancy, surveyed 750 registered voters in Maryland, Virginia, Delaware and Washington, DC, on environmental issues facing the area, including attitudes and policy preferences regarding climate change, the health of the Chesapeake Bay, access to parks and more. The poll showed that, among the Latino voters who participated in the survey, 75% are concerned about climate change, 76% are concerned about climate impacts on the ocean and bays, 71% are concerned with water pollution and 70% are concerned about extreme heat. Further, nearly eight in 10 of all respondents, including Latinos, considered the health of the Chesapeake Bay important to them on a personal level.

Similarly, Latino voters who participated in the survey overwhelmingly supported



Latino visitors enjoy the waterfront at Sandy Point State Park in Maryland. (Michael Bowman/Chesapeake Bay Gateways Network)

policies that protect and improve the environment. The poll found that nine in 10 Latino voters, and voters at large, want to invest in protecting their state's land, waters and wildlife, even in the midst of economic challenges brought on by the COVID-19 pandemic. The poll found that 89% of Latino voters support the 30 by 30 land conservation goal, and 83% support gradually transitioning to 100% of the country's energy being produced by clean, renewable sources like solar and wind. Further, 89% of the Latino voters polled support the creation of new marine sanctuaries to protect ocean waters and wildlife. The same percentage also supports creating national parks, national monuments and national wildlife refuges to protect historic sites or areas for outdoor recreation.

In addition, when asked to choose between environmental protections and oil and gas drilling, most of the Latino respondents want to ensure public lands and waters are protected and safe. Sixty-seven percent want their congressional representatives to prioritize environmental protections over energy production, compared with 52% of all voters. Moreover, 74% of the Latinos polled said that we should

strictly limit onshore and offshore oil and gas development or stop it altogether.

When asked about their familiarity with the Bay and its current environmental conditions, 62% of the Latino voters responded that they believe that the Bay's environmental condition is fair or poor. After the pollster shared a few of the ways threats to the Chesapeake Bay can hurt communities throughout the region — such as pollution, loss of wildlife critical to commercial fisheries, severe flooding and limited access to nature — 87% of the Latino voters said they support the creation of a Chesapeake National Recreation Area. Further, 84% of Latinos and 86% of all voters polled said that it should be a priority for their state to work to restore the Bay.

Despite the challenges Latinos often face in accessing nature — largely because people of color are three times more likely than white people to live in “nature-deprived” places — Latino families are frequent users of public lands. Sixty-four percent of Latino voters report having visited national parks or other public lands within the last year, with 39% visiting three or more times. When it comes to addressing environmental justice and the

lack of parks, nature and green space in communities of color, strong majorities of both Latinos and non-Latinos called for equitable access to protected lands and clean air and water. Nine in 10 Latinos support directing funds to ensure adequate access to parks for lower-income people and communities of color that have disproportionately lacked them, as well as dedicating funding to address air and water pollution in low-income areas.

Latino voters are committed to preserving the environment, including addressing pollution, creating access to parks, transitioning to clean energy and protecting our treasured lands, waters and the Chesapeake.

Forthcoming legislation to conserve 30% of the state must keep in mind this important constituency and actively engage Latinos in conservation efforts, ensuring that equity and environmental justice are advanced even as we protect nature and climate. We are calling for a 30 by 30 initiative that addresses the climate emergency, protects our treasured lands and ocean and prioritizes clean water and healthy air, especially for vulnerable communities like our own. ■

*Shanna Edberg is the director of conservation programs at the Hispanic Access Foundation.*

### 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](http://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 [tsayles@bayjournal.com](mailto:tsayles@bayjournal.com) or 410-746-0519. You can also reach us at P.O. Box 300, Mayo, MD, 21106. Please include your phone number and/or email address.



## Farmers make progress for Bay, unlike development trends

By Holly Porter

A generation of Maryland farmers in the Chesapeake Bay watershed have tried to meet two goals: produce the food our growing country needs and reduce the amount of nutrients their lands deliver to the country's largest estuary. They have made greater advances toward both goals than the farmers before them could ever have envisioned, increasing chicken production substantially over the past 35 years while reducing their yearly nitrogen contribution by 11.6 million pounds and cutting phosphorus runoff by 1.2 million pounds a year. During that time, Maryland's population grew from 4.5 million to 6.1 million.

The uncomfortable truth is that, while farmers have answered the call to reduce pollution, developed areas seem to have taken it as permission to pollute more. For

every 8 pounds of nitrogen Maryland farmers kept out of the Bay through improved practices in the past 10 years, Maryland's developed areas have added back 1 pound, by way of stormwater runoff, according to Chesapeake Bay Program models. For phosphorus, it's 1 pound added for every 13 pounds eliminated by farmers.

How have farmers and the companies they collaborate with reduced pollution? By changing their day-to-day operations and investing in strategies to reroute and reuse nutrients. Today's chicken farmers compost and reuse chicken litter, as well as store, cover and document every pound of litter before it leaves their farms.

Many environmental groups have approached the challenge of nutrient reduction in a spirit of collaboration with farmers. Others, like the Environmental

Integrity Project, seem interested only in portraying chicken farmers as villains. Determined to overstate chicken farmers' impact on water quality, they ignore the fact that just 14% of the nitrogen delivered to Delmarva's tidal areas of the Bay comes from poultry litter, according to the Chesapeake Bay Program. That's less than half of what comes from commercial fertilizer. Still, EIP produced a report this past fall (See *Report: When MD chicken farms fail inspections, few face penalties*, December 2021) that demonized chicken growers and misinterpreted Maryland's environmental regulations — and they got the misleading

headlines they wanted.

A Delmarva without farms may seem impossible, but it's happened before. In the middle of the 20th century, Long Island, NY, was a major potato producer. But suburban sprawl ate up farmland and transformed that region, all but erasing its agricultural character and value. Few would wish that fate on Maryland's Eastern Shore, least of all the farmers who are strongly committed to feeding us while protecting the Chesapeake Bay. ■

*Holly Porter is executive director of the Delmarva Chicken Association.*

## Enough cheerleading. How about accountability?

By Tom Pelton

As the Chesapeake Bay cleanup effort has continued to languish without any real progress, we keep hearing a familiar tune from Maryland's farm lobby.

The claim is that the agricultural sector, the largest single source of pollution in the Bay, has been making heroic progress in reducing pollution — but that urban areas are not doing their fair share and environmentalists refuse to acknowledge the success of farmers.

We've heard this argument again recently from the Delmarva Chicken Association, which has criticized our organization, the Environmental Integrity Project, for a report we released this past fall (See *Report: When MD chicken farms fail inspections, few face penalties*, December 2021).

Our report, *Blind Eye to Big Chicken*, examined more than 5,000 pages of records from the Maryland Department of the Environment and concluded that 84%

of the 184 poultry operations inspected between 2017 and 2020 had violated their state water pollution control permits. But only 2% of these operations — four of them — were penalized by the state.

The chicken lobby's response has been to issue a string of false and misleading claims. Among these is that farmers have dramatically reduced both their phosphorus and nitrogen pollution over the last three decades, allegedly based on figures by the Chesapeake Bay Program "that are the gold standard for measuring the Bay's health."

This is a misleading use of Bay Program computer modeling estimates, which are designed to guess what might happen years or decades in the future if pollution control practices employed by farms (such as planting trees beside streams) perform as well as the U.S. Environmental Protection Agency hopes they will in reducing



*Poultry farms play a large role in agriculture on the Chesapeake Bay's Eastern Shore. These poultry houses are located in Somerset County, MD. (Dave Harp)*

runoff. These computer estimates of the future were never intended to show past progress and furthermore have been widely criticized as inaccurate by both farmers and environmentalists.

The only real gold standard for measuring past success in reducing pollution is actual water monitoring. Our organization examined state water monitoring data at 18 locations in Eastern Shore rivers and found that phosphorus and algae levels have remained stuck at the same high and

unhealthy level over the last 20 years.

This is not just a problem of "lag time" — a delay between farmers doing the right thing and seeing positive results in the water. We documented a chronic problem of a multibillion-dollar industry repeatedly breaking the law, mishandling waste, overapplying manure and facing no consequences for it. ■

*Tom Pelton is director of communications for the Environmental Integrity Project.*





# BULLETIN BOARD

## VOLUNTEER OPPORTUNITIES

### WATERSHEDWIDE

#### Citizen Science: Creek Critters

Use Audubon Naturalist's Creek Critters app to check a stream's health by identifying small organisms living in it, then creating a report based on what you find. Get the free program at App Store or Google Play. Info: [anshome.org/creek-critters](http://anshome.org/creek-critters). Learn about partnerships/ host a Creek Critters event: [cleanstreams@anshome.org](mailto:cleanstreams@anshome.org).

### VIRGINIA

#### Pond cleanup program

The Prince William Soil and Water Conservation District in Manassas has added One-Time-Pond Cleanup to its programs. Volunteers can now join the PWS & WCD in the fall or spring to clean up a pond with no other commitments. The district is also working on getting kayaks to support the needs of this new program and its volunteers. Info: [waterquality@pwsacd.org](mailto:waterquality@pwsacd.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@pwsacd.org](mailto:waterquality@pwsacd.org). Register for an event: [trashnetwork.fergusonfoundation.org](http://trashnetwork.fergusonfoundation.org).

#### Goose Creek Association

The Goose Creek Association in Middleburg needs volunteers for stream monitoring & restoration,

educational outreach & events, zoning & preservation, river cleanups. Projects and internships for high school, college students. Info: Holly Geary at 540-687-3073, [info@goosecreek.org](mailto:info@goosecreek.org), [goosecreek.org/volunteer](http://goosecreek.org/volunteer).

#### Citizen Science: Ghosts of the coast

The Gedan Lab at George Washington University and the Virginia Coast Reserve Long-Term Ecological Research project are asking the public to help document the formation of ghost forests — dead forests created by rising sea level. See a ghost forest? Contribute to a collaborative map by submitting observations to [storymaps.arcgis.com/stories](http://storymaps.arcgis.com/stories).

#### Chemical water monitoring teams

Help the Prince William Soil and Water Conservation District and Department of Environmental Quality by joining a chemical water quality monitoring team. Participants collect data from local streams. Training provided. Monitoring sites are accessible. Info: [waterquality@pwsacd.org](mailto:waterquality@pwsacd.org), [pwsacd.org](http://pwsacd.org).

#### Become a water quality monitor

Train online with the Izaak Walton League to volunteer or become a certified Save Our Streams water quality monitor. Follow up with field practicals, then adopt a site of your choice in Prince William County. Info: Rebecca Shoer at [rshoer@iwla.org](mailto:rshoer@iwla.org), 978-578-5238. Web search "water quality va iwla." Activities include:

- *Snap a Stream Selfie*: Collect trash data, take a photo at a local stream.
- *Become a Salt Watcher*: Use an easy test kit to check for excessive road salt in a stream.
- *Check the Chemistry*: Spend 30 minutes at a waterway with a handful of materials, downloadable instruction sheet.
- *Survey Stream Critters*: Use pictures in an app to identify stream inhabitants. The number, variety of creatures reveal how clean the water is.
- *Monitor Macros*: Become a certified Save Our Streams monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess habitat, report findings, take action to improve water quality.

#### VA Master Naturalists

VA Master Naturalists is a corps of volunteers who help to manage, protect natural areas through plant & animal surveys, monitor streams, rehabilitate trails, teach in nature centers. Training covers ecology, geology, soils, native flora & fauna, habitat management. Info: [virginiamasternaturalist.org](http://virginiamasternaturalist.org).

#### Check out cleanup supplies

Hampton Public Libraries have cleanup kits that can be checked out year-round, then returned after a cleanup. Call your local library branch for details.

### MARYLAND

#### Patapsco Valley State Park

Patapsco Valley State Park volunteer opportunities include: daily operations, leading hikes or nature

crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons and seamstresses. To search for volunteer opportunities at Patapsco or state parks, visit [ec.samaritan.com/custom/1528](http://ec.samaritan.com/custom/1528), then click on "opportunity search" in the volunteer menu on the left side of the page. Patapsco-specific info: 410-461-5005, [volunteerpatapsco.dnr@maryland.gov](mailto:volunteerpatapsco.dnr@maryland.gov)

#### Delmarva Woodland Stewards

The U.S. Department of Agriculture's Forest Service and Maryland Forest Service are creating a training and outreach program, *Delmarva Woodland Stewards*. Funding from the federal Landscape Scale Restoration Grant program will be used by the partnership to demonstrate, educate, provide outreach that will enhance forest and wildlife management practices, promote the ecological benefits of prescribed fire, pursue tree planting opportunities for water quality and highlight the need for low grade/biomass markets in forest health, restoration, sustainability. The program provides direct training, outreach to landowners and volunteers who want to learn more about how to implement forest, wildlife management practices. Info: Matthew Hurd at [matthew.hurd@maryland.gov](mailto:matthew.hurd@maryland.gov).

#### Annapolis Maritime Museum

The Annapolis Maritime Museum & Park is seeking volunteers. Info: Ryan Linthicum at [museum@amaritime.org](mailto:museum@amaritime.org).

#### St. Mary's County museums

Become a member of the St. Mary's County Museum *Division Volunteer Team* or *Teen Volunteer Team*.

- *Adults*: Assist with student/group tours, special events, museum store operations at St. Clement's Island Museum and Piney Point Lighthouse Museum & Historic Park. Work varies at each museum. Info: At St. Clement's Island Museum, 301-769-2222. At Piney Point Lighthouse Museum & Historic Park, 301-994-1471.
- *Students*: (11 & older) Work in the museum's collections management area on artifacts that have been excavated in the county. Info: 301-769-2222.

#### Report a fish kill

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

#### Severn River Association

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

See **BULLETIN**, page 40



## Submission Guidelines

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. March issue: February 11 April issue: March 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 [kgaskell@bayjournal.com](mailto:kgaskell@bayjournal.com). Items sent to other addresses are not always forwarded before the deadline.



### WORKDAY WISDOM

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





# BULLETIN BOARD

**BULLETIN** from page 39

## Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation remove invasive plants 10 a.m.–4 p.m. the second Saturday in February, March and April 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 a.m.; return at 5 p.m. Carpool contact: 301-277-7111.

## Chesapeake Bay Environmental Center

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

## Chesapeake Biological Laboratory

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

## Citizen science: Angler survey

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

## Patuxent Research Refuge

Volunteer in the Wildlife Images Bookstore & Nature Shop inside the Visitor Center, on the South Tract of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Help for a few hours or all day 11 a.m.–4 p.m. Wednesday through Saturday. Open/close the shop, help customers, restock, run the register. A future webstore may need volunteers. Training provided. Info: wibookstore@friendsofpatuxent.org.

## ATLANTIC COAST

### Become a seal steward

To address the significant increase in seal sightings, the Maryland Coastal Bays Program and the National Aquarium are seeking volunteers for its seal steward program. This is an 'on call' duty: When a seal hauls out, stewards are contacted to see if they are available to patrol the haul out area to make sure beach and dog walkers keep a safe distance. This protects the walkers and dogs and reduces the serious stress these landings can create for the seal. The public is reminded that seals are protected by the Marine Mammal Protection Act and it is against the law to touch, feed or otherwise harass them. Viewers are required to stay at least 50 yards from the resting seal. Those who encounter a seal on the beach should call the National Aquarium stranding hotline 410-576-3880 or 1-800-628-9944 so a trained observer can evaluate the condition of the seal to determine if its behavior is normal or if the seal is in distress. Info: sandis@mdcoastalbays.org.

## CONFERENCES/CLASSES

### PENNSYLVANIA

#### Wildlife Leadership Academy

The Wildlife Leadership Academy is accepting nominations of/applications for Pennsylvania teens, ages 14-17, to attend one of five rigorous summer field schools that focus on wildlife/fisheries biology and conservation as well as leadership skills development taught by 20+ wildlife professionals from the PA Game Commission and the PA Fish and Boat Commission.

The academy themes are:

- *PA Bucktails*: June 14–18. White-tailed deer biology, habitat, management.
- *PA Bass*: June 21–25. Bass, warm water conservation.
- *PA Brookies*: June 19–23. Brook trout, coldwater conservation.
- *PA Gobblers*: July 26–30. Wild turkey biology, habitat.
- *PA Ursids*: Aug. 2–6: Black bear biology, habitat needs.

After the camp, the program continues with community outreach through education, service, media engagement, creative arts and outdoor mentorship. Those who complete the five-day/four-night academy become a certified conservation ambassadors, and have an opportunity to obtain three college credits through Cedar Crest College. They are also eligible to apply to return the next year as a youth mentor tuition-free; attend a professional wildlife or fisheries conference; compete

for college scholarships; request letters of recommendation for jobs/college applications; join an Academy Alumni Network of 100+ wildlife, fisheries, and conservation professionals. They are also expected to engage in conservation focused community outreach after the field school. Students will be selected based on academic/non-academic achievements and activities, and a personal essay. The \$500 tuition includes housing, meals. Scholarship support is available at 50% (\$250) and 80% (\$400) levels. Those requesting scholarships will receive a scholarship form during the application process. If accepted, students are encouraged to connect with their community to find additional tuition support. The deadline to apply to the academy is March 15. Contact: Youth & Alumni Outreach Manager Katie Cassidy, at 570-939-5109, kcassidy@wildlifeleadershipacademy.org, or wildlifeleadershipacademy.org/camps.

## EVENTS / PROGRAMS

### VIRGINIA

#### Winter Wildlife Festival

Join Virginia Beach Parks & Recreation and partners for *Winter Wildlife Festival*, a celebration of coastal wildlife and nature, Jan. 28–30. The event features a keynote presentation by Jennifer Ackerman, author of *The Bird Way*; a birding challenge; outdoor excursions; exhibit hall; birding challenge; photo contest. The event is free but requires registration: vbgov.com/winterwildlife.

### MARYLAND

#### CBMM's Winter STEAM Team

The Chesapeake Bay Maritime Museum in St. Michaels invites youths to become part of its STEAM (*Science, Technology, Engineering, Art, Math*) Team. Participants take part in hands-on exploration. The 10 a.m.–12 p.m. session

is designed for ages 4–6; while the 1–3 p.m. session is for ages 7–9. Class sizes are limited; advanced registration needed. Fee: \$15 per class. Sign up for all four for a discount. Need-based scholarships for individual classes are available. Info: bit.ly/WinterSTEAMTeam. The schedule is:

- *Sail by the Stars*: Jan. 29
- *Art in Motion*: Feb. 5
- *Happy Habitats*: Feb. 12
- *Brackish Brushes*: Feb. 19
- *Makeup date for inclement weather*: Feb. 26.

## Chesapeake Bay Maritime Museum

The Chesapeake Bay Maritime Museum in St. Michaels is presenting the *18th National Exhibition of the American Society of Marine Artists* through Feb. 22. The juried biennial exhibition includes paintings, drawings, sculptures, scrimshaw, hand-pulled prints submitted by prominent contemporary marine artists. Entry included w/general admission, which is good for two days: \$16/ages 18–64; \$13/ages 65+; \$13/students (ages 17+ w/college ID); \$12/retired military w/ID; \$6/ages 6–17; free/active military; ages 5 & younger. Info: cbmm.org, 410-745-2916.

## Anita C. Leight Estuary Center

Check out of the events at the Anita C. Leight Estuary Center in Abingdon. Except where noted, ages 12 & younger must be accompanied by an adult. Registration is required for all events. Info: 410-612-1688, otterpointcreek.org.

- *Critter Dinner Time*: 1 p.m. Jan. 16 & Feb. 27. All ages. Learn about turtles, fish, snakes while watching them eat. Free.
- *Full Moon Hike & Campfire*: 6–7:30 p.m. Jan. 16. Ages 8+ See what animals are out under the full moon. Fee: \$8.
- *Snowstorm in a Jar*: 10:30–11:30 a.m. Jan. 22. Ages 5+ Take part in a snowy experiment, create a snowstorm to take home. Fee: \$10/project.
- *Nuts & Squirrels*: 1:30–2:30 p.m. Jan. 22. Ages 5+ Learn about squirrels, search for them on the trails, make a squirrel craft. Fee: \$10/family.
- *Winter Scavenger Hunt*: 1–2 p.m. Jan. 23. Ages 4+ Search for signs of winter on the trails. Complete a scavenger hunt to win a prize. Refreshments. Fee: \$10/family.
- *Winter Fairy Houses*: 1:30–3 p.m. Jan. 23. All ages. Create a home for mythical woodland fairies. Search the wood's edge for sites where these might be at home. Fee: \$12/project.
- *World Wetlands Day Celebration*: 12–4 p.m. (Sign up for a time slot: 12, 1, 2 or 3 p.m.) Jan. 29. All ages. Games, crafts, music, special guests will highlight wetlands. Fee: \$10/family.
- *Beautiful Bountiful Bark*: 12:30–1:30 p.m. Jan. 30. Families. Hike the park's trails to learn how bark can be a helpful identification tool. Make a rubbing to keep. Tasty "bark" treat included. Fee: \$10/family.



## CHESAPEAKE CHALLENGE

### ANSWERS TO

Are you frond of ferns?  
on page 27

1. Pteridology
2. Ankylosaurus, diplodocus, stegosaurus, triceratops
3. Nine
4. Phytoremediation
5. Thirty
6. Blackish, brownish, reddish, yellowish
7. Become invisible





# BULLETIN BOARD

■ **Critter Dinner Time:** 10:30 a.m. Feb. 12. All ages. Learn about turtles, fish, snakes while watching them eat. Free.

■ **Twig Detectives:** 1–2 p.m. Feb. 12. Ages 5+ Learn how to identify trees by examining twigs. Head outdoors for a twig-matching tree hunt and then return to the center to make an edible twig snack! Fee: \$10/family.

■ **Snowflake Study:** 1–2 p.m. Feb. 13. Ages 5+ Discover how frozen water crystals form in the sky. Create a snowflake. Fee: \$10/family.

■ **Birding Basics at Edgewood Recreation Center in Edgewood:** 3–4 p.m. Feb. 18. Ages 8+ Bird watching boosts mental health. Learn about benefits, basics of birding, birding apps. Practice skills on short walk outside. Binoculars provided. Free.

■ **Owl Prowl at Bosely Conservancy in Edgewood:** 7–8:30 p.m. Feb. 18. Ages 8+ (15& younger w/ adult). Venture into the woods to listen, look for owls. Fee: \$8.

■ **Bird Walk at Bosely Conservancy in Edgewood:** 9–10 a.m. Feb. 19. Ages 8+ Hike the trails of this 390-acre protected wetland and participate in the annual backyard bird count. Refreshments and binoculars provided. Fee: \$10/family.

■ **Nature Discovery Tots:** 10:30 a.m. Feb. 19. Ages 0–6. Explore Nature Discovery Area with a naturalist. Free.

■ **Natural Bird Feeders:** 1–2 p.m. Feb. 20. All ages. Collect supplies from nature to create a bird feeder for your yard. All materials provided. Fee: \$10/family.

■ **Tracks, Scat & Mud at Bosely Conservancy in Edgewood:** 10:30 a.m.–12 p.m. Feb. 26. Ages 5+ Search for signs of wildlife on the trails. Create a track mold to take home. Fee: \$10/family.

■ **Campfire Series / Session 3:** 12:30–2 p.m. Feb. 26. Ages 7+ Focus is on campfire cooking. Fee: \$15/family.

## CBMM Winter Speaker Series

The Chesapeake Bay Maritime Museum's annual winter speaker series, *Building Business*, blends the perspectives of industry leaders and historical scholars for a look at businesses that are uniquely Chesapeake. Some sessions will be virtual; others take place in CBMM's Van Lennep Auditorium in St. Michaels. Fee: \$7.50. Virtual & in-person ticket packages available. Advance registration is required. Info, registration: [bit.ly/CBMMSpeakerSeries](http://bit.ly/CBMMSpeakerSeries).

■ **Route One - Styling Maryland Pride through Apparel:** 5 p.m. Jan. 26 (virtual). Route One Apparel founder and CEO Ali Von Paris shares how the local community inspired her product lines and corporate social responsibility initiatives.

■ **Chesapeake Light Craft & the Business of Building Boats:** 1 p.m. Feb. 2 (auditorium). Owner and managing director John C. Harris traces his path from building boats in his parents' garage to leading the world's largest build-your-own-boat-kit business.

■ **A Chicken in Every Pot - The Rise of Delmarva's Poultry Production:** 1 p.m. Feb. 9 (virtual).

Roger Horowitz, director of the Center for the History of Business, Technology and Society at the Hagley Museum and Library, will discuss the rise of Delmarva's poultry industry and its environmental, social, economic impacts.

■ **Oyster Aquaculture: Past, Present, & Hopes for the Future:** 5 p.m. Feb. 16 (auditorium). Imani Black, founder of Minorities in Aquaculture, will speak on opportunities offered by aquaculture, farming seafood in a sustainable way.

■ **Port of Baltimore - The Wealth in our Water:** 1 p.m. March 9 (virtual). Dominic Scurti, deputy director of planning at the Maryland Port Administration, will discuss the latter's role in developing regional trade and the Port of Baltimore's history, current state, preparation for the future.

■ **Crab Industry Catalysts: Coulbourne & Jewett Seafood Packing Company:** 1 p.m. March 16 (auditorium). This company was a pioneer in the crab-packing industry in the early 1900s. CBMM's Chief Curator Pete Leshner will explore the successes, challenges, legacy of this Black-owned business, which operated on Navy Point until the 1960s.

## PENNSYLVANIA

### York County parks

The public is invited to these York County Department of Parks & Recreation events. All programs take place at Nixon Park in Jacobus and are free unless otherwise noted. Space is limited to ensure social distancing. All programs are weather permitting for safety and may be rescheduled. Info: [YorkCountyParks.org](http://YorkCountyParks.org). Registration is required for all events: [NixonCountyPark@YorkCountyPA.gov](mailto:NixonCountyPark@YorkCountyPA.gov), 717-428-1961. Include name, number of participants, children's ages, phone number.

■ **Waterfowl Watch at Kain Park, York:** 10–11 a.m. Jan. 16, Feb. 9, Feb. 16. Meet at Lake Redman's Spartan Road parking lot. Teens & adults. Look for migrating waterfowl, learn how to identify them.

■ **Nature Story Time:** 10–11 a.m. Jan. 20 (*Counting is for the Birds*) & Jan. 27 (*Flying Squirrel at Acorn Place*). Children w/adult. Interactive story.

■ **All About Insects in the News Virtual Lecture:** 6:30–7:30 Jan. 26. Teens & adults. Jorge Santiago-Blay from Penn State University will describe invasive & beneficial insects: spotted lanternfly, annual cicada, native bees, as well as research at Nixon Park.

■ **Owl Walks:** 6:30–7:30 p.m. Jan. 27, Feb. 3. Teens, adults. Take a quiet walk through the forest at night. A naturalist will call to local owl species to see or hear "whoow" responds.

■ **Skulls & Biofacts Drop-in:** 8:30 a.m.–4 p.m. Jan. 28 & 29; 12:30–4 p.m. Jan. 30. Families, adult supervision required. Investigate and touch animal bones, shells, feathers, antlers. Guided

scavenger hunt. Only groups of 10 or more are required to register.

■ **Birdhouse Workshops:** 10–11 a.m. & 1–2 p.m. Feb. 5; 1–2 p.m. Feb. 6. Families. Learn about area cavity-nesting birds, how to maintain, monitor birdhouses. Then, build a birdhouse. Kits are \$15, limit two kits per family.

■ **Maple Sugaring Nature Walks:** 2–3:30 p.m. Feb. 12 & 13. Weather permitting. Families. Take a winter-themed walk through the sugar bush to learn about collecting maple sap, making syrup. One-mile loop includes steep inclines, declines.

■ **Great Backyard Bird Count Walks:** 10–11:30 a.m. Feb. 18–20. Families. Watch, learn about, count birds on walks to collect data for Audubon's annual count. If the weather isn't conducive for a trail walk, stay inside to watch the bird-feeders.

■ **Maple Sugaring Days:** 10–3 p.m. Feb. 26 & 27. March 5 & 6. Families, ages 6+ Follow a self-guided track through indoor and outdoor maple sugaring interpretive stations. Learn to identify a maple tree, tap it, make maple syrup. Optional 0.5 mile walk up Bird Hollow trail features volunteers boiling sap at a modern boiling station. Maple products will be on sale. Fee: \$2. No registration.

■ **Nature Walks:** 2–3:30 p.m. March 13 & 20. Families. Casual walk explores spring changes: signs of wildlife, migrating birds, wildflowers.

## RESOURCES

### WATERSHEDWIDE

#### Wild MD cookbook online

The Maryland Department of Natural Resources' new online cookbook, *Wild Maryland*, includes recipes submitted by state residents that feature waterfowl, seafood, deer, other wild game that can be hunted, trapped, caught. It also includes a section of recipes that features ingredients found while foraging in the wild. Recipes were evaluated by a team of panelists who are subsistence hunters, anglers or wild game/fish-cooking enthusiasts. A resources section includes tips for wild foraging, directions for fileting a fish, links to DNR's guides, *Hunting & Trapping* and *Fishing & Crabbing*. The DNR has also launched a Pinterest page where users can pin recipes ([pinterest.com/MarylandDNR](https://pinterest.com/MarylandDNR)). Submissions will continue to be accepted at [recipes.DNR@maryland.gov](mailto:recipes.DNR@maryland.gov) and may be published in future editions of *Wild Maryland*.

#### Farm tool, equipment sharing forum

Future Harvest/Chesapeake Alliance for Sustainable Agriculture has created a tool & equipment sharing platform to set up farmer-to-farmer lending, renting or custom hiring. Farmers can submit a form that sets terms for the lending arrangement: fee charged; rental period; pick-up, delivery options; custom hire availability; other details. Equipment is listed under one of five

categories: hand tools, tractors, implements, shop tools and other. Farmers who would like to try out equipment before buying are also encouraged to browse the list. The site is regularly updated, check for new listings. Info: Lisa Garfield at [Lisa@futureharvest.org](mailto:Lisa@futureharvest.org).

### Chesapeake Network

Join the Alliance for the Chesapeake Bay's *Chesapeake Network* (web search those words) to learn about events and opportunities that protect or restore the Bay, including webinars, job postings and networking.

### Tour Maryland parks

Learn about history, nature highlights, Harriet Tubman's life, corn snakes, wildflower hikes by taking a virtual tour of Maryland's state parks. To view one of 29 videos, Web search: "MD DNR YouTube."

## PENNSYLVANIA

### PA parks Winter Report

The Pennsylvania state parks *Winter Report* allows winter outdoor recreation enthusiasts to monitor snow and ice conditions with state parks. The report is updated weekly (at a minimum) by state parks during the winter season and lists the ice thickness and if it is thick enough for activities. The report also lists the snow thickness and what snow activities are available at that park. The report is searchable by park and by winter outdoor recreation activity. Web search: "PA state parks winter report."

### PA trail guide

The Pennsylvania Department of Conservation and Natural Resources' online *Explore PA Trails* has information on more than 650 trails across 12,000 miles in the state. Users can search by trail name, zip code, or activity (ATV, biking, cross country skiing, equestrian, four-wheel drive, hiking, off-road motorcycling, snowmobile, water trail.) Info: [trails.dcnr.pa.gov](http://trails.dcnr.pa.gov).

## 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 (Wednesday) email report.

### DNR educational resources

The Maryland Department of Natural Resources produces at-home learning resources on topics ranging from aquatic life and estuaries to fishing tips and ways to "green" your lifestyle. Visit: [dnr.maryland.gov/ccs/Pages/At-Home-Learning.aspx](http://dnr.maryland.gov/ccs/Pages/At-Home-Learning.aspx).



# Global trends the Chesapeake Community can't ignore



By Kate Fritz

Last year, as we at the Alliance for the Chesapeake Bay celebrated our 50th anniversary, we had a great time looking through our archives. It was also enlightening; we uncovered so many photos, partnership letters, project reports and board meeting minutes — all of which helped us piece together where the organization has been in those five decades. But as fun and enlightening as that was, it also prompted many staff and board conversations about the critical challenges that lie ahead of us, and the Bay restoration effort as a whole, in the next five decades.

We can't look ahead to 2071, or even the next few years, without acknowledging two major global trends that will drive drastic change in our work: the profound demographic changes we can expect to see in the not-so-distant future and the stark realities of climate change, which in many ways are already upon us. Both trends are, of course, global in scale, but they will have real impacts on the Bay region.

It is no secret that the U.S. population is getting older and more racially diverse at the same time. The U.S. Census Bureau projects that 2030 will be a “demographic turning point,” when the entire Baby Boom generation (born 1946–64) will be older than 65 — meaning one in five Americans will be at or older than retirement age.

At the same time, the racial and ethnic composition of the younger cohort is projected to diversify dramatically. By 2060, only one-third of children and half of adults are expected to be non-Hispanic White.

And then there's climate change, which simply cannot be denied or ignored any longer; the world's climate *is* changing. The impacts expected to occur in the Chesapeake Bay mimic the projections for the East Coast of the U.S. and include:

- Increasingly severe storms and longer periods of dry and wet weather: This year, Annapolis saw remnants of Hurricane Ida



*Youth gather for a ribbon-cutting event to celebrate a stream restoration at Asbury Broadneck United Methodist Church in Annapolis in 2019. The church partnered with the Alliance for the Chesapeake Bay and other organizations on the project, which helped address flooding that was threatening gravesites in the church's historic African American cemetery. (Will Parson/Chesapeake Bay Program)*

kick up an F-2 tornado that destroyed businesses and houses in its wake.

- Sea level rise: The subsiding landmass of the Chesapeake, combined with rising water levels, make for a perfect storm of increasingly frequent flooding in low-lying, vulnerable areas. Annapolis experienced an average of 3.8 floods per year from 1957 to 1963. Compare that to the seven-year period of 2007 through 2013, when flooding occurred an average of 39 times a year, according to the Maryland Commission on Climate Change.

- Increasingly strange and extreme weather: Some jokingly call this “global weirding,” but it's quite real, with real consequences. For instance, half of the largest snowstorms on record for the region have occurred in the last two decades — since 2003, to be exact.

What does an aging and diversifying population in a time of climate crisis mean? Well, it means a few things for the Chesapeake Bay, and for the Alliance, in the next 50 years. It means working at the intersection of environmental health and human health is more critical than ever. Many of the methods we adopt to mitigate, prevent and adapt to the day-to-day impacts of climate change can be engineered to improve equity in both social justice and environmental justice issues.

When we focus on urban neighborhoods for tree-planting funds and initiatives, we can help reduce the urban “heat island” effect, which increases the risk of heat

stroke and takes many lives every year in underserved and comparatively treeless communities.

When we focus on urban neighborhoods for rain garden installations and other natural methods for absorbing and filtering increasingly heavy rainfall, we keep polluted floodwaters out of streets and prevent basement flooding in homes that can least afford the damage.

When we implement workforce development initiatives, we can choose to introduce people from all communities and income strata to real-world skill sets and educational opportunities for entry into the environmental field.

When we understand that diversity in any ecosystem is critical to its resilience and vibrancy, we understand the need for the environmental movement to diversify — to very intentionally include the perspectives that aren't currently represented — for the sake of equitable and just solutions for the long-term future.

So, where do you start or continue? I do not have all of the answers, of course, but I have a few examples of how the Alliance, and I personally, have been working to center equity in our work. As in forming any new habit, like remembering to bring your reusable bags into every store, it takes time and practice.

- Diversify your social media feeds: There are so many amazing social media accounts out there, curated by incredible emerging and national leaders from diverse

walks of life. Add the website of United Women on the Fly or Instagram pages like the Black Forager (more than 800,000 followers), Intersectional Environmentalism (more than 400,000) or Hunters of Color.

- Invite new voices to conversations: We all have an opportunity to invite new voices to decision-making conversations, where they can contribute new perspectives. When you head to that next networking event, think of a colleague or acquaintance to invite who might have an entirely different point of view or life experience.

- Pay speakers and “thought partners”: It's important that we pay the leaders we ask to join us to speak or share thought leadership in professional spaces. Work of this kind should be treated as just that: work.

- Rethink who you learn from: I'm always looking for new leadership blogs and information, and I have made a conscious effort to seek new perspectives from non-White thought leaders, researchers and writers.

The next 50 years of work ahead of us will continue to challenge both our ecosystems and our human systems and will continue to require persistence and focus. Just remember, our actions don't have to be perfect or profound, and they won't immediately fix anything. But we have to take those first steps, and they should be in the direction of equity and inclusion. ■

*Kate Fritz is the chief executive officer of the Alliance for the Chesapeake Bay.*



# Too far north for white pelicans? Not anymore



By Mike Burke

Back when I was new to birding, I heard that Blackwater National Wildlife Refuge was a top location for viewing winter birds. So, my wife and I set off on the two-hour trip to Maryland's Eastern Shore to look for winter waterfowl. We weren't disappointed then, nor during our many return trips. I saw my first bald eagle at Blackwater and, as impossible as it seemed, my first white pelican.

That first pelican sighting left me doubting my eyes. I focused my binoculars on huge white birds loafing on a dry patch of land in the distance. I was stymied. They looked like pelicans, but my field guide said the species wasn't supposed to be there. Not trusting my identification skills, I flagged down a refuge scientist as she drove by. "Oh, yes," she assured me. "Those are white pelicans." After occasional appearances in earlier years, a sizable cohort of these big birds has made Blackwater its annual winter home for more than a decade. They start arriving in November, and some will stay until April.

American white pelicans (*Pelecanus erythrorhynchos*) are true giants. Their wingspans, which can exceed 9 feet, dwarf the bald eagle's 6- to 7-foot span. They weigh up to 20 pounds. Males are usually

a bit larger than females, although they have identical plumage that makes gender determination difficult in the field.

At rest, the bird's brilliantly white feathers are offset with just a touch of black at its rear. In flight, the pelican displays extensive black on its wings, top and bottom, especially the ends. In breeding season, the bird also has a small black cap.

The massive, 2-foot bill is as striking as the vivid black and white feathering. The expandable pouch that attaches to the lower bill is typically retracted and barely visible, except when feeding. As the bird lifts its bill out of the water, the huge sac expands, capturing water and whatever fish might be in it. The water quickly drains, and the bird then swallows the catch. During the brief breeding season, the white pelican's bill is bright orange and has an odd, laterally flattened fibrous plate standing up from the top bill. This "horn" resorbs rapidly after breeding, and its function is unknown. In nonbreeding months, the bill and legs are orange-yellow.

Adult pelicans eat about 2 pounds of food daily. Their diet consists primarily of small fish, along with crayfish and amphibians. White pelicans practice cooperative feeding. They encircle schools of fish. All at once, each bird lowers its bill. Frightened fish, trying to avoid a gaping mouth, end up swimming right into another one. In addition to this synchronized bill dipping, the birds will work together to surround a school of fish, flapping their wings to "herd" the fish into shallower water, where they are easier to catch.

In Canada, white pelicans breed from British Columbia to the western edge of Ontario. In the U.S., breeding occurs every summer in California and in scattered states all the way to Minnesota. When shallow water begins to freeze, the birds



American white pelicans are now a winter regular at Blackwater National Wildlife Refuge. (Gatorphotography/CC BY-NC-ND 2.0)

begin migrating south. Those west of the continental divide tend to use islands in large lakes for their breeding colonies. They winter along the Pacific coast, from Southern California down through Central America. Birds breeding east of the divide tend to use shallow lakes and ephemeral wetland islands. For the most part, the eastern birds winter along the Gulf Coast and into Mexico. But for some, Maryland's Eastern Shore is as far south as they need to go. Warming temperatures associated with climate change may be responsible.

American white pelicans breed in colonies. Nests consist of little more than a circular scrape in the soil or vegetation. Colonies average about 950 nests, so the locations are teeming with birds.

The female lays 2 eggs, the second about 2 days after the first. Both parents incubate the eggs, a process that takes a month. The first egg hatches a day or two before the second, but that small advantage has big implications for the survival of the second

hatchling. Over the two to three weeks that the parents feed the young at the nest, the older baby does its best to get all the food and harass its sibling. Parents don't intervene. The younger bird typically dies, usually of starvation.

Pelicans can only support one youngster a year, so this brutal evolutionary development helps to assure that one hatchling survives. The second egg is viewed by wildlife biologists as the "insurance" egg. If something should happen to the first egg, the second promises the pelican parents an opportunity to successfully raise a chick.

Three weeks after the eggs hatch, parents leave the nest site but not their feeding duties. This leads to the formation of "creches," large groups of young birds from the colony that huddle together for warmth at night. The parents have no trouble finding their own youngster in the teeming creche and providing food. It takes nine to 10 weeks before the young pelicans are ready to fly. Once they master that, they abandon the creche and soon depart the colony altogether.

American white pelicans initially amazed me with their immense size and extraordinary bills. Today, I'm more interested in what I have never seen: the early life of these magnificent birds. Seeing is believing, but so is the trust we put in experts. Their wealth of experience and specialized knowledge open vast vistas filled with fascinating perspectives on the bird's natural history. We are the richer for it when we trust science. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.



American white pelicans are cooperative feeders, known to circle a school of fish to crowd them together and make them easier to catch. (Dave Harp)



# Go outside to track down beauty, wildlife in winter landscape



By Kathy Reshetiloff

The holidays are over, and winter has set in. Many people prefer to spend most of the season inside in front of a warm fire. The greens of summer and warm colors of autumn have been replaced with uninspiring grays and browns. The skies are quieter as migrating raptors, waterfowl and songbirds have reached their wintering grounds. But winter reveals beauties of its own for those who take some time to explore.

Chesapeake Bay waters may look dark and foreboding. Look again. Odd sculptures of driftwood, deposited by winter storms, adorn the shorelines. Brown grasses glisten with morning frost. Crystalline waterlines mark the rhythm of the tides.

Trees bare of leaves may look lifeless, but, like other living creatures, they are merely dormant. Their twigs hold tightly packed buds that contain next spring's foliage. The buds of each species are distinctive; like the bark, winter buds help to identify the tree.

Naked trees also unveil last year's nests.



A red fox takes pauses on a snowy landscape. (Tambako/CC BY-ND 2.0)

A clump of leaves in an oak is the treetop home of a gray squirrel. Vacated nests of wasps, shaped like upside-down spinning tops, hang delicately from tree branches.

Bird nests still attached to tree limbs tell much about their inhabitants. A loose nest of thorny branches with an inner layer of moss and grass might have been that of a mockingbird. A deeply cupped, neatly lined nest in a thicket probably belonged to a catbird. The small, drooping pouch of soft plant fibers is likely the handiwork of the northern (Baltimore) oriole. If you see what looks like a small knot of moss on a tree branch, look more closely. It might be the tiny nest of the ruby-throated hummingbird.

Quiet and still as winter may be, wildlife still abounds. Anyone with a passion for feeding birds is treated to a daily performance as sparrows, chickadees, finches, nuthatches, juncos, cardinals, woodpeckers, crows and blue jays all vie for space at a feeding station. Squirrels busily search for the nuts they buried in the summer or fall — or, failing that, they merely raid the nearest un-squirrel-proofed bird feeder.

Most of the mammals in this region do not actually hibernate. Deer, mice, foxes, squirrels and rabbits are active throughout winter. Even beavers remain active, though they spend most of their time in their lodges. When water freezes, the beavers feed on the bark they stashed at the bottom of the pond during the fall.

Meanwhile, groundhogs (also called woodchucks) do truly hibernate. Others, like chipmunks, raccoons and skunks, go into a semi-hibernating stage. They may sleep for days or weeks at a time but occasionally emerge for food or when drawn out by an unusually warm winter day.

You may not realize that other wildlife lives near you until a little snow blankets the ground. Take a walk immediately after a snowfall and look for telltale tracks. Begin by studying familiar tracks. The tracks of a dog are different from those of a cat. Whether wild or domestic, canine prints show claws, while feline prints do not because cats retract their claws when walking, running or at rest.

Dog prints differ from those of foxes, too — not so much in the individual print as in the pattern of the tracks. Because of the way they walk, foxes leave tracks that form what appears to be a single line; dogs leave roughly parallel pairs of tracks.

A rabbit's tracks, with its pair of large hind feet and smaller forefeet, are



Spray from Maryland's Choptank River makes icy artwork of the dormant flora along the shore. (Dave Harp)

distinctive and easily identified.

A field guide on animal tracks (Peterson, Audubon, et al.) is helpful to both the novice and experienced tracker. By carefully studying tracks, you can not only identify the animal that made them but also make an educated guess about where it might have been headed. Tracking also includes trying to deduce why this animal was moving and what may have occurred during its journey.

So, when the winter blues bring you down and cabin fever abounds, look to the outdoors for a new experience. Quietly wander alone and look up, down and inward. The winter air is very quiet when there's snow, which muffles ambient sound and makes it easier to hear telltale noises. Listen for the rustling of birds and other wildlife seeking food and cover. Listen as

the trees sway and groan in the wind. The absence of foliage reveals otherwise invisible patterns — complex branch structures in trees and shrubs, or graceful slopes and swales that you'll never see in the summer.

Freezing temperatures create other works of natural art, like evergreen branches drooping artfully under the weight of snow, icicles decorating branches or rocks in a stream and the fairy-tale quality of an ice-glazed forest after freezing rain.

If you explore with your eyes wide open, you may see all of this. Soon you may feel like you, too, are part of this winter landscape, and spring won't seem so far away. Or maybe it won't even matter. ■

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office in Annapolis.